



**Public Service Commission of Wisconsin
Office of Energy Innovation
Energy Innovation Grant Program
ATTACHMENT A - Application Cover Sheet**



Public Service Commission of Wisconsin
RECEIVED: 01/21/2021 11:49:24 AM

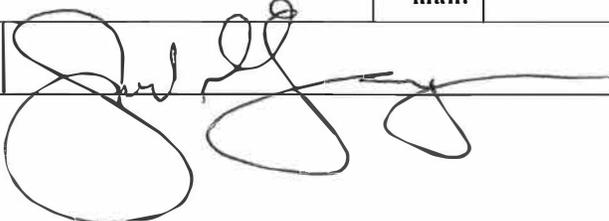
SECTION I - Provide information summarizing the project proposal.			
Project Title:		MG High School Solar PV Installation	
PSC Grant Request (\$):		Applicant Cost Share (\$):	Project Total (\$):
250,000 (20.2%)		989,478 (79.8%)	1,239,478
Choose one Eligible Activity			
<input checked="" type="checkbox"/> Renewable Energy & Energy Storage	<input type="checkbox"/> Energy Efficiency & Demand Response	<input type="checkbox"/> Electric & RNG Vehicles & Infrastructure	<input type="checkbox"/> Comprehensive Energy Planning
Acknowledgement of ARRA Applicability. Check all that apply. (see Section 1.3 of Application Instructions)			
<input checked="" type="checkbox"/> Buy American: Project: Alteration, maintenance or repair of a public building or public work.			
<input checked="" type="checkbox"/> Davis Bacon and Related Acts: Use of laborers or mechanics employed by contractors and subcontractors.			
<input checked="" type="checkbox"/> Historic Preservation: Project involves historical (over 50 years old), archeological or cultural resources.			
<input checked="" type="checkbox"/> National Environmental Policy Act (NEPA): Project activity is NOT covered by the list shown in Section 1.3.3.			
SECTION II - Provide information for your organization, signatory, and primary contact for the project.			
Applicant Type:	<input type="checkbox"/> City	<input type="checkbox"/> Village	<input type="checkbox"/> Town
<input type="checkbox"/> County	<input type="checkbox"/> Tribal Nation	<input type="checkbox"/> Manufacturer	<input checked="" type="checkbox"/> K-12 School District
<input type="checkbox"/> University of Wisconsin System	<input type="checkbox"/> Wisconsin Technical College System	<input type="checkbox"/> 501(c)(3) nonprofit	
<input type="checkbox"/> Municipal Utility (water, wastewater, electric, natural gas)		<input type="checkbox"/> Hospital (public or nonprofit)	
Name (on W-9):		Monona Grove School District	
Address (on W-9):		5301 Monona Dr. Monona, WI 53716	
County or Counties Served by Project:		Dane	
DUNS Number or CAGE Code:		005781059	
NAICS Code:		611110	
Authorized Representative/Signatory (Person authorized to submit applications and sign contracts)		Primary Contact (if different from Authorized Representative)	
Name:	Jerrud Rossing	Name:	
Title:	Director of Business Services	Title:	
Phone:	608-316-1916	Phone:	
E-mail:	Jerrud.Rossing@mgschools.net	E-mail:	
Signature of the Authorized Representative			

Table 1

Monona Grove School District MG High School Solar PV Installation				
Summary of Project Budget				
Line	Description	PSC Grant Request	Applicant Cost Share	Total Project Cost
1	Personnel		\$30,000	\$30,000
2	Fringe			\$0
3	Equipment			\$0
4	Supplies			\$0
5	Travel			\$0
6	Contractual	\$250,000	\$954,478	\$1,204,478
7	Other			\$0
8	Indirect			\$0
Totals		\$250,000	\$984,478	\$1,234,478
% of Total		20%	80%	-

Table 2. Contracted Services and Materials Detail

Estimate Summary			
Line Item	Match	Grant Request	Estimate
Modules	\$ 274,316	\$ 71,850	\$ 346,166
Inverters, RS Units and Transformer	\$ 79,209	\$ 20,747	\$ 99,956
Racking System	\$ 70,998	\$ 18,596	\$ 89,594
DAS System	\$ 10,302	\$ 2,698	\$ 13,001
Installation Materials/Labor	\$ 367,645	\$ 96,295	\$ 463,940
Design Engineering/Commissioning	\$ 54,456	\$ 14,263	\$ 68,719
Project Management and General Conditions	\$ 72,275	\$ 18,930	\$ 91,205
Permits and Utility Fees	\$ 2,200	\$ 576	\$ 2,776
Shipping	\$ 16,460	\$ 4,311	\$ 20,771
Sales/Use Tax	\$ -	\$ -	\$ -
Bonding	\$ 6,617	\$ 1,733	\$ 8,350
Total Project Cost	\$ 954,478	\$ 250,000	\$ 1,204,478

MG High School Solar Project

Executive Summary

With funding support from the Energy Innovation Grant Program (EIGP), the Monona Grove School District (MGSD) will develop and install a 674.7kW rooftop solar photovoltaic (PV) system atop its existing high school. This project will allow MGSD to meet multiple financial, operational, educational, and sustainability objectives that are valued by MGSD, its students and faculty, the Monona Grove community, and the State of Wisconsin.

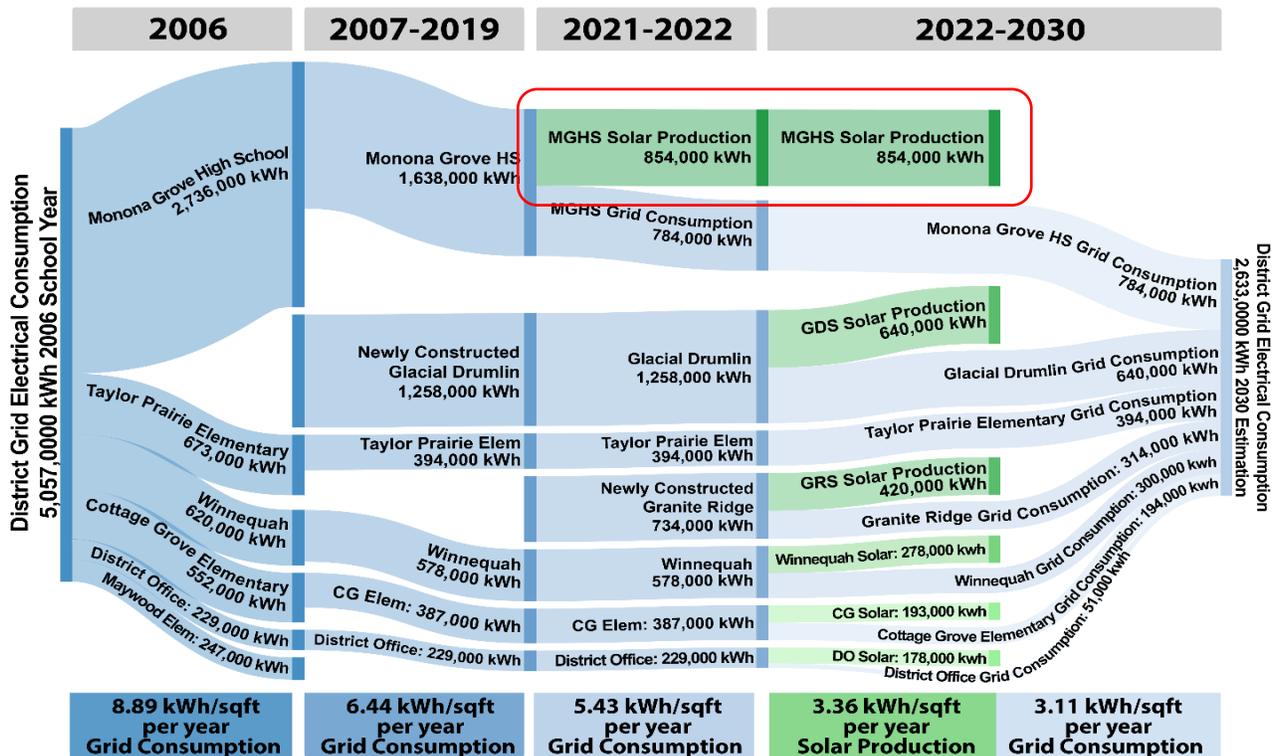
Background

In 2006, analysis of Wisconsin school finance data revealed that the MGSD's energy expense per student was amongst the highest for Wisconsin schoolsⁱ. Embarking on a strategic initiative to reduce its energy footprint, MGSD became one of the first districts to take advantage of Wisconsin's Revenue Limit Exemption for Energy Efficiency program. Utilizing energy performance contractingⁱⁱ, over the next decade four phases of efficiency enhancements were completed resulting in a net savings of \$260,000 per year with a reduction of 1700 tons of green-house gas emissions.ⁱⁱⁱ During this same time period, MGSD constructed two new schools, replacing natural gas heated spaces with highly efficient state of the art geothermal HVAC. Our newest facility will have a 69% reduction in total energy use compared to building code requirements.^{iv}

This grant proposal for the MG High School (MG High School) Solar PV Project represents the next step on MGSD's sustainability path

As shown in **Figure 1**, the MG High School Solar Project represents a watershed event that will allow MGSD to build on its past energy efficiency successes and expand its efforts to become a leader in clean energy generation for the State of Wisconsin. This project is the next step on a clear path for MGSD to generate at least 50% of its electricity from distributed solar installations.

Figure 1. MGSD past, present, and future path to sustainability. The red box defines the project proposed in this grant application. Future years demonstrate project payback and replicability to district buildings.

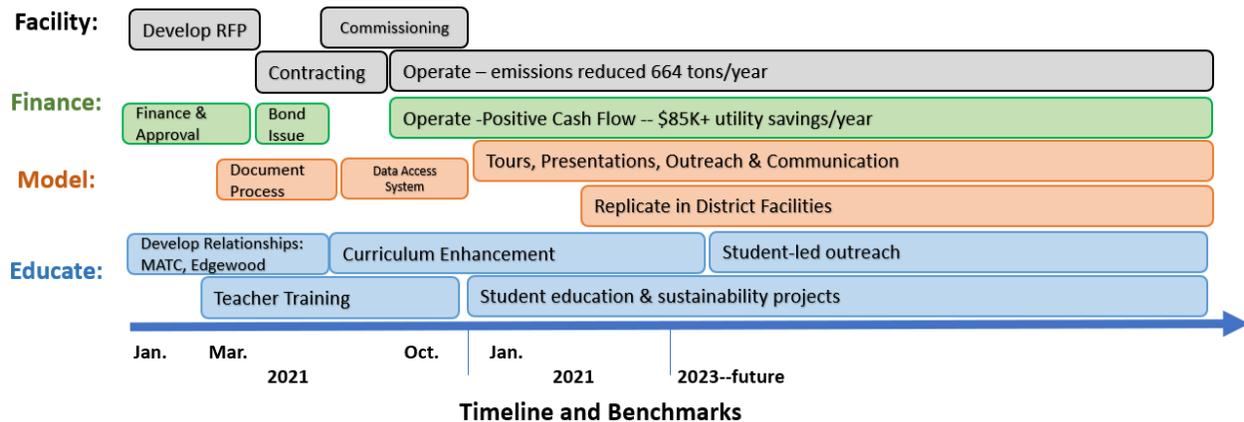


Project Objectives and Metrics:

In alignment with the EIGP strategic objectives, this project will provide leadership and benefit to MGSD, the community, and the State in four areas: **(1)** Reduce MG High School’s reliance on fossil fuel electric power by 48%; **(2)** Improve MGSD finances with a net benefit of \$1.5M; **(3)** Provide a practical and replicable model to accomplish large scale sustainable development utilizing familiar financial and operational tools available to all schools; and **(4)** Provide educational opportunities to improve outcomes for the students of Monona Grove and the greater Madison area community (**Figure 2**).

- 1. Reduce GHG and emissions.** This solar installation will provide MG High School with sustainable, emission free solar electricity that will reduce regulated airborne pollutants (*i.e.*, NO_x, ozone, particulate matter, mercury) and eliminate 665 metric tons of CO₂ greenhouse gas to improve regional air quality and meet community expectations for responsible resource stewardship.
Metrics: Clean electric power generated by the PV system meets 48% of facility consumption.
Outcome: *Regional air and water quality are improved through avoided fossil fuel combustion and public awareness of the environmental benefits of solar technology.*
- 2. Improve school finance.** The MG High School Solar Project provides a positive financial return, redirecting operational funds from utility bills towards supporting MGSD’s educational mission.
Metrics: The project is cash flow positive in year 1, and annual electricity savings of \$85K exceeds operational, maintenance, and financing costs, for an economic benefit of \$1.5M over 25 years.
Outcome: *Additional financial resources are made available in MGSD’s operational budget for funding of teaching and curriculum. Funding “beyond the basics” is a key factor in expanding the range of school resources available to underserved communities.*
- 3. Model for sustainable development in Wisconsin schools.** Provide a practical, compelling, and replicable model for the future development of sustainable infrastructure for MG and districts statewide. The model will rely primarily on traditional funding and implementation mechanisms, such as non-referendum borrowing and performance energy contracting.
Metrics: Based on this project’s data and experience, MGSD will execute additional solar installations to meet a 50% reduction of fossil-fuel based electric power. MGSD will make the process, data, and results widely available, including online and through the Wisconsin Association of School Boards, Dane County School District Business Administrators, Dane County Office of Energy and Climate Change, the MREA Solar on Schools Program, and other entities.
Outcome: *Project results in a model that will be replicated at other MG facilities and across the state. If each of Wisconsin’s 446 school districts implements a single solar project of similar size to MG High School, this would result in over 300 MW of new clean energy generating capacity for the state – more than double the size of Wisconsin’s largest currently operating utility scale solar farm.*
- 4. Educate and affect positive change.** Leverage the PV solar installation, data, monitoring system, and college partnerships as part of a comprehensive strategy to integrate more sustainability into the curriculum, to provide educational and career opportunities for students, and to promote public awareness.
Metrics: MGSD will make project performance and outcomes available to students, the public, and other stakeholders. MGSD will partner with Madison College and Edgewood College to enhance curriculum in multiple areas related to sustainability including science, technology, engineering, business, and environmental justice.
Outcome: *Public awareness and support for sustainable power is elevated. Students are better prepared for living in, and working toward, a more sustainable, just, and equitable world.*

Figure 2 Timeline of major events in each Objective



Impact and Application: This proposal aligns directly with the mission of the PSC EIG by covering an energy-related project (installation of solar), that will directly reduce current energy consumption, support renewable energy resiliency, and provide a comprehensive energy strategy to be used and replicated by others. This project is designed to provide leadership that will enable School Districts in Wisconsin to make significant steps in moving forward with sustainability goals.

Key Stakeholders:

Monona Grove School District: Supervise project and financing, monitor performance, and payback. Develop educational opportunities and relationships. Maintain communications. Execute future sustainability plans and follow-on projects. Model for other districts and communities.

MGSD Ad Hoc Sustainability Committee: Leverage project to develop advanced sustainability plan with demanding but attainable goals. Continue to promote and provide relevant opportunities. Promote project lessons and awareness through documentation and presentation to all interested. Cultivate strategic partnerships.

MGSD Faculty: Leverage training and collaboration with Madison College and the Center for Renewable Energy Advanced Technological Education and Edgewood College's Sustainability Leadership Program. Enhance curriculum in science, technology, business, environmental and energy justice. Re-invest utility savings in education.

MGSD Students: Participate in outreach, fundraising and sustainable development, including project-based learning in multiple curricular areas.

Communities of Monona and Cottage Grove: Motivate public school district to continue to improve district environmental footprint, fiscal management, and student learning.

McKinstry Co., LLC. Provide expert project management, system commissioning and evaluation.

A comprehensive list of stakeholders is included in [Appendix B](#).

Letters of Support from ten important stakeholders are included in the application references ([section 3.5](#)). These letters illustrate the readiness of stakeholders to participate and MGSD's capacity to build relationships required to meet projects objectives.

3.4.1. Eligibility and ability to achieve the objectives.

The applicant is a public school district in the State of Wisconsin and is an eligible entity under section 1.2.2.1 of the application

MGSD is a public school district serving primarily the City of Monona and the Town and Village of Cottage Grove.^{vii} The School District has an enrollment of 3400 students from an area with a total population of ~18,000. MGSD extends across the eastern edge of the Madison metro area in Dane County, and serves students from urban, suburban, and rural areas.

MG High School enrolls 1024 students, 18% minority, 19% disadvantaged, and 10% open enrollment students. Minority enrollment is 78th percentile in the state.^{viii} The High School's size and composition are representative and relatable to many suburban and small city school districts across the state, with enrollment ranking in the 3rd quartile of state high schools,

This project proposal is eligible for funding under the EIGP proposal under Activity:

MGSD will construct a 674.7 kW solar photovoltaic system on the roof of MG High School. This will be the largest solar PV system installed by a K-12 school in the State of Wisconsin as an upgrade to an existing facility rather than part of a new construction project. The proposed PV system is expected to offset approximately 48% of the site's electric usage and reduce annual utility expenses by \$85,000 starting in the first year.

MGSD is aware of the requirements for compliance with the provisions of the ARRA, including the Buy American Provisions, Davis-Bacon, Historic Preservation and National Environmental Policy. Monona Grove's Sustainability Committee includes members who have successfully applied for and received awards under these ARRA requirements.

MGSD and the proposed subcontractor have significant experience with the management of construction and energy efficiency projects which will ensure project success

Primary financial and management responsibility for the MG High School Solar Project lies with Director of Business Services Jerrud Rossing and Superintendent Dr. Daniel Olson. Rossing has 15 years of experience managing school finance including supervising budgets of \$65M ([Appendix C](#)). In his tenure with MGSD Rossing has supervised the construction of two school buildings and the management of multiple energy efficiency projects. To date, MGSD has successfully implemented four phases of such projects at the cost of \$14M, resulting in an annual utility savings alone of approximately \$260,000 (see [Section 3.4.7](#) of this application.)

MGSD has been engaged in an 11-year effort to reduce its overall environmental footprint as well as make better use of its financial resources through the process of increasing the energy efficiency of all seven district buildings. In 2019, MGSD formed a Sustainability Committee to draw on community expertise to further advance district sustainability goals. This committee advises district leadership on sustainability and related finance, policy, and educational issues. The committee makeup includes members with experience and responsibility for implementing large scale solar PV projects including several on public school buildings. Team members have implemented nationwide sustainability projects for a fortune 500 firm, authored successful proposals for ARRA funding through the Departments of Energy, Labor, and Commerce, advised municipal sustainability efforts, and have executed fundraising campaigns for several capital-intensive community initiatives.^{ix}

Applicant sub-contractors

For the proposed MG High School Solar Project, MGSD has partnered with McKinstry Co., LLC^x to provide construction management services, including feasibility and engineering analysis. MGSD has

previously had energy savings performance contracts with McKinstry to improve the efficiency of district buildings. McKinstry is an energy services company with more than 60 years of national and local experience partnering with school districts, universities, and municipalities to deliver energy efficiency and renewable energy project development, including projects that have integrated and leveraged ARRA-based grant funds. A list of relevant McKinstry projects in Wisconsin is included in the references.^{xi} McKinstry's team will work with MGSD to ensure all requirements of the EIGP grant are met, including the American Recovery & Reinvestment Act (ARRA) regulatory compliance provisions (Buy American, Davis-Bacon and Related Acts, Historic Preservation, and National Environmental Protection Act).

MGSD's successful record of improving district sustainability through application of practiced methodology increases the rigor, generalizability, and replicability of this type of project.

3.4.2. Budget Justification and Cost Share ("Match")

Budget Justification

McKinstry has provided an estimate of the solar project construction costs (**Table 2, Attachment B**). Total construction budget is estimated at \$1,204,478, approximately \$1.78/watt. This estimate is based on their recent experience with solar projects in Wisconsin and is consistent with the NREL Solar PV Installed Cost Benchmarks that show a national average of \$1.75 per watt for projects of this size.^{xii} *This estimate includes consideration of ARRA restrictions to purchase only US manufactured goods and Davis-Bacon prevailing wage requirements.*

Based on the above estimates, the MG High School system will cost roughly \$0.81/watt for the solar modules, inverters, and balance of system equipment (somewhat higher than the NREL benchmark due to the ARRA Buy American Provision requirements), and \$0.69/Watt for the contracted solar PV installers overhead, labor, and materials (also higher than the NREL benchmarks due to the Davis-Bacon prevailing wage requirements), the remainder of the cost is composed of various soft costs related to project management, engineering, procurement, contracting, insurance, and permitting. MGSD acknowledges that actual costs could change depending on any modifications of federal solar energy tariffs, trade restrictions, or new incentive policies. Any changes would likely serve to improve the prospects of the solar industry but are not factored into the project finances at this time.

Actual costs for this project will be determined by competitive bids in response to a publicly issued Request for Proposals (RFP). The winning proposal will be selected based on a rubric that will consider cost competitiveness and other desirable project metrics such as: prior experience, the ability to offer a long-term operations and maintenance contract, the engagement of women, minority, and veteran owned small businesses as contractors/subcontractors, employer equal opportunity and diversity policies, and other appropriate factors.

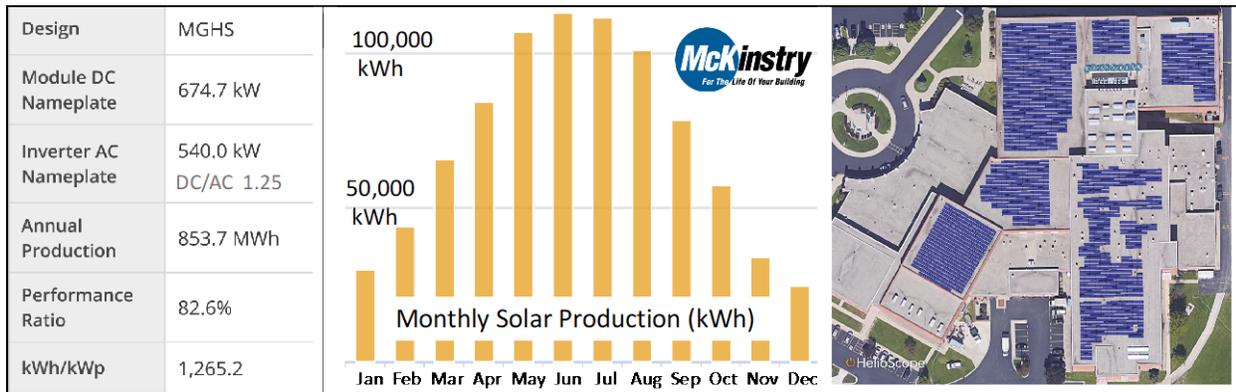
Project Match

MGSD estimates providing a project match of \$984,478, to be raised primarily through district bonding. This match will rely primarily on traditional and familiar capital borrowing tools, so that this project can be replicated elsewhere with common school financing mechanisms. In addition, MGSD will be seeking additional grants, and donations where available, including a \$50,000 solar incentive that has already been reserved with the Focus on Energy Program. MGSD estimates a \$30,000 match of in-kind resources, primarily through staff time in project management, faculty and curriculum development in sciences, technology, engineering and business departments at MG High School, and public and student outreach. No EIGP funds are requested for these educational activities.

3.4.3. Savings and Payback

In 2020, solar site assessments were conducted by McKinstry for all MGSD facilities. MG High School was identified as the top priority because the building is the largest energy consumer in the district, serves the largest number of students, and offers the best platform for community awareness and visibility. A site assessment report evaluated the building electric load and roof conditions, and provided PV system sizing estimates, preliminary system design, and projected energy generation (**Figure 4**). This site assessment was combined with operating and maintenance costs (estimated at \$0.07/Watt/year) and additional economic parameters were used to model the annual cash-flow, payback period, internal rate of return, and net present value of the MG High School solar PV system. The complete site assessment document is available in the reference materials (**Appendix A**)

Figure 1 Helioscope report excerpts



Financial Assumptions, Payback, and Financial Outcomes

Lifetime project value

MGSD anticipates significant savings from the energy production of the solar PV system. Listed below are the expected savings, simple payback and investment returns to be generated over a 25-year period. These numbers are based on the cost of the project and the potential EIGP grant. They do not include the value of any Focus on Energy Incentive payments, or fundraising donations that will be solicited from the Monona Grove Community at a later date. As shown below, even without those additional financial considerations, the MG High School Solar Project will deliver significant value to MGSD:

- 1st Year Value of Solar Energy (\$/kWh): \$0.106
- 1st Year Energy Savings (at 95% of expected production): \$85,652
- 25-Year Energy Savings (escalating at 3% annually): \$2,869,410
- Simple Payback (with \$250k EIGP grantee award): 10.5 years
- Total Lifetime Benefit (project + operating costs) – (EIGP grant + value of solar): \$1,509,642

Annual project cash flow

With projected savings of \$85,651 in the first year of operation and a financing expense of \$72K the project will be cash flow positive to the school district from the first year. In school district finance, utility bills and teacher salaries are both paid from the same operational budget that is fixed under state revenue caps. Over time this project removes \$2.9M of utility expenses from the operational budget in exchange for \$900K of capital expense. This allows for a net of \$1.5M of valuable operating funds to be applied MGSD's educational mission. In addition, the positive cash flow provides evidence of the low risk of this solar PV investment to stakeholders, an important consideration in publicly financed entities.

3.4.4. Energy Savings and Environmental Impact.

Monona Grove School District recognizes its responsibility to protect the planet and welcomes the role of environmental steward for our greater community, by reducing MGSD's reliance on fossil fuels.

Electrical consumption of MG High School Building

The MG High School building, constructed in 1997, is a 236,000 sq ft building that obtains electrical power from Madison Gas and Electric (MGE). The high school building alone accounts for 40% of the total electric use by MGSD. The annual electric usage for the high school, in a typical year, is approximately 1,850,000 kWh. In 2020, MGSD implemented the most recent of a series of energy efficiency upgrades with the installation of high efficiency LED lamps in this building, with a projected annual savings of 250,000 kWh. This reduced the building's annual electrical consumption to about 1,600,000 kWh. MGSD energy usage, past energy efficiency efforts, and the impact of the MG High School Solar Project is summarized in **Figure 1**.

Energy savings and emissions reductions for the MG High School Solar Project

The proposed 674.7 kW solar PV system will produce nearly 853,000 kWh in the first year, equivalent to roughly 48% of the building's annual electricity and 16% of MGSD's entire consumption. The EPA Greenhouse Gas Equivalencies Calculator (GGEC) estimates that the MG High School solar installation will offset 332 tons of coal combustion and 665 tons of carbon dioxide emissions each year.^{xiii} A more detailed picture of the MG High School project's pollution reduction impact was also modeled using the EPA Avoided Emissions and Generation Tool (AVERT) which accounts for the daily and seasonal cycles and regional marginal emissions associated with solar PV.^{xiv} Applicable marginal emission rates are those for the Midcontinent Independent System Operator (MISO) region that includes the State of Wisconsin. This differs from the national average because coal-fired generation in this region is more than 70% greater, resulting in more nitrogen oxides, particulate matter, mercury and carbon dioxide per kWh of energy. Based on the EPA AVERT tool, the National Energy Technology Laboratory analysis of the composition of the sub-bituminous coal commonly used in the MISO region, and on US Geological Survey studies of the mercury content of coal supplies, the following reductions are expected over the operating life of the MG High School solar PV system:

- **16,513 tons of coal consumption:** The majority of Wisconsin's electricity is produced by coal fired power plants. Coal combustion is a significant source of pollutants such as nitrogen oxide, particulate matter, mercury, and carbon dioxide.
- **44,100 lbs. of nitrogen oxide (NOx) emissions:** Nitrogen oxide emissions contribute to ground-level ozone production. Ozone in the region has been near the EPA limits for several years, and this toxic substance triggers asthma attacks for children.
- **5,400 lbs. of PM2.5 particulate matter (soot) emissions:** These pollutants are released as microscopic (<2.5 micron) particles that are smaller than human red blood cells and penetrate deep into the lungs causing respiratory illness.
- **2.8 lbs. of mercury emissions:** Our community is very conscious of water pollutants because of our close proximity to the Madison area lakes. If released to the environment, this amount of the toxic metal would contaminate over 120,000,000 gallons of water. That is roughly equal to one year's worth of drinking water consumed by the City of Monona.
- **31,000 tons of carbon dioxide emissions:** The most common greenhouse gas responsible for global climate change. This is roughly equal to the annual CO₂ emissions of the 4000 housing units located in the City of Monona.

Curtailing emissions of pollutants such as nitrogen oxides, ozone, particulate matter, and mercury is a MGSD goal and important outcome of the proposed MG High School Solar Project. Furthermore, because airborne pollutants migrate once introduced to the atmosphere, the actions taken by MGSD will benefit both district residents and others living throughout the greater south central Wisconsin region. Reducing carbon dioxide emissions, the most common of the greenhouse gases and the primary driving force of climate change, is another key component of MGSD's sustainability efforts. Dane County has made a commitment to be carbon-neutral by 2050 and has undertaken several large projects to begin the work towards that transition.^{xv} MGSD aids in these sustainability efforts with projects such as the proposed MG High School solar installation. Climate change is a global phenomenon, the MG High School solar project provides an educational opportunity for Monona Grove students to study climate science and learn about international relations, while making a real-world contribution to help address this global environmental challenge.

3.4.5. Equity and Energy Justice

Based on measures from the Wisconsin Department of Public Instruction, MG High School ranks amongst the top quartile of Wisconsin high schools for the diversity of its population. *Public School Review* measured a diversity score of 0.32 for MG High School, meaning that if you select any two students at random, there is a 32% chance they will be from different ethnic groups. Approximately 8% of MG High School students are identified as having a disability, and 19% are economically disadvantaged.

As our name implies, Lake Monona is a focal point for MDS and our community. Unfortunately, the lake has been compromised by pollution resulting from nearly a century of coal fired electricity generation. The Department of Natural Resources advises that women and children should not consume Lake Monona bass, northern pike, walleye, or yellow perch more than once a month. Furthermore, although the lake is widely regarded as a top fishing destination for muskellunge, these fish should not be eaten - at all - due to toxic levels of mercury contamination. This is a significant environmental equity issue because many of Monona's lower income and under-represented minority residents depend on wild caught fish as an affordable way to augment their diets. This is especially true for the Native American community members living in the area. Monona was the ancestral summer grounds of the Ho-Chunk nation. Fish from the area lakes and other edible plants and wildlife from the Yahara River, Paunack Marsh, and Nine Springs E-Way have formed dietary staples for members of the Ho-Chunk community for many generations. **The MG High School solar installation is a tangible initiative to begin addressing a century of environmental degradation and will make a contribution toward restorative justice for our residents who have suffered the most from these past abuses.**

The Madison Metropolitan Area, of which MGSD is a part, routinely approaches the threshold for compliance with ozone and particulate matter pollution limits set by the Environmental Protection Agency. Asthma is the most common chronic childhood disease in the United States, affecting 6.1 million children under the age of 18 and is the third leading cause of hospitalization for children under 15.^{xvi} Asthma and respiratory diseases disproportionately impact lower income and underrepresented minority children in urban areas. Although medical advances have improved the outcomes of respiratory disease in children, significant racial/ethnic challenges continue to be reported in the asthma rates of school aged children. Madison Metropolitan School District reports that approximately 33% of the enrolled children with an asthma diagnosis are African American, 35% are White, and 14% are Hispanic students.^{xvii}

Environmental advocates and some members of the Environmental Protection Agency have proposed lowering the ozone standard from 70 to 65 ppb, based on ozone's known effects on children, the elderly, and people who have asthma and other lung diseases. If this rule is updated with a more stringent limit, Dane County will find it necessary to lower our ozone levels to for regulatory compliance.^{xviii} Increasing the amount of solar energy in the Madison Metropolitan area means that MGE peaker combustion

generators and the Blount Street power plant will not need to operate as frequently, reducing NOx emissions and ground level ozone concentrations. This outcome would benefit the health of students attending MG High School and other schools throughout the region, especially those disadvantaged students that are most affected by asthma and other respiratory illnesses.

The MG High School solar project represents a concrete step towards addressing the disparate impacts of greenhouse gases globally and the regional impacts of other emissions from fossil fuel energy production.

3.4.6 Financial Leverage and Economic Impact.

The EIGP funding will directly support this project

As publicly funded and revenue limited institutions, public schools face significant financial barriers to implementing renewable energy projects. Demands on limited resources, aversion to risk, lack of expertise in technical and financial areas outside of their education mission, and unavailability of tax credit incentives are just some examples. Furthermore, state revenue limits hinder schools' ability to raise funds for energy investments through the property tax levy. In addition, the COVID-19 pandemic has introduced uncertainty into school finance that is likely to persist for several years. This makes it extremely challenging for schools to pursue renewable energy investments that have negative cash flow or indeterminate future paybacks.

The EIGP grant enables MGSD to finance the project with a simple payback period less than 11 years, making it consistent with other sustainability projects MGSD has completed. This project will be cash flow positive in the first year of operation (See **Section 3.4.3**). Positive cash flow in the first year provides solid evidence for the elected school board that the project has low risk and will not create budget gaps that could drain resources from MGSD's educational mission. This funding mechanism provides MGSD an opportunity to advance renewable energy technology and education while also demonstrating good stewardship of taxpayer dollars. An EIGP award will provide an incentive to stimulate additional community fundraising for the MGSD solar project. Likewise, it will reassure stakeholders and the public that the project is both technically sound and on firm financial footing.

Without EIGP funds, it is unlikely that MGSD would be able to complete the MG High School solar project at this time. Instead, MGSD would need to wait for an equivalent improvement in the solar market conditions before implementing this project. Such a delay would be incompatible with the other goals of this project to provide leadership in creating a reusable model for sustainable development in K-12 schools.

Additional Grant Funds

In anticipation of implementation of this project, MGSD has applied for and received a \$50,000 reservation for the Focus on Energy incentive program, the maximum incentive offered for a project of this size.^{xviii}

School and Community Fundraising

MGSD will implement a community outreach campaign to engage community residents, current students, and MG alumni. Students serving on MGSDs Sustainability Committee are the conduit between their peers and the adult committee members. These students have shared the constant social media chatter about the urgent need to act related to climate change. These students will generate the grassroots support needed from their peers to engage the rest of the community in giving to this important project that helps secure a healthy planet for future generations. The students are supported by the Monona Grove Sustainability Committee who will serve as mentors and take lead roles in direct asks of individuals to fund the campaign.

The sustainability committee has already been in contact with marketing and economics instructors at MG High School, and the school is preparing to launch a student led campaign in spring 2021. Students will develop education and outreach materials to help with promoting the project and building community awareness. This student driven community outreach model to support renewable energy will serve as a model that other school districts can replicate. MG High School students will share their results with other schools, such as Madison West High School, that have had successful student-led initiatives. By doing so, identification of common positive strategies will be assembled into a list of recommended practices for others seeking to execute similar solar photovoltaic community-based projects.

Economic Impact

This proposal will have a significant positive economic impact to MGSD and the surrounding community. Cost projections anticipate a minimum \$2.9M savings to the operational budget over a 25-year project life and are detailed in **Section 3.4.3** of this application. These savings are equivalent to the hiring of two additional teachers per year, with the benefit increasing each year beyond 25 that the PV system remains viable.

Following the Great Recession and subsequent recovery, the Department of Labor examined the effectiveness of various types of fiscal stimulus to boost the workforce and address unemployment. The DOE Estimates of Job Creation from the American Recovery and Re-investment Act of 2009 found that one new job was created for every \$92,136 of government spending. Based on these numbers, the MG High School Solar Project would be **expected to create 13 new jobs**.

3.4.7. Existing Energy Planning Efforts.

Twelve-year effort to improve energy efficiency in all district facilities

MGSD has engaged in a sustained effort to reduce its environmental footprint and make better use of its financial resources through an ongoing process of increasing its facilities energy efficiency. Since 2008, MGSD has invested in four phases of energy and operational efficiency projects at a cost of \$14M, this has resulted in an annual utility savings of \$230,000 as of the 2017-18 school year. The most recent project included LED relighting and controls of the HS site at the cost of \$500K with a projected annual utility and operation savings of \$70,000. Recognizing the value of energy efficiency as the most cost-effective way of reducing environmental impact, MGSD to date has prioritized energy efficiency over other types of sustainability projects. The remaining efficiency projects available to MGSD have diminishing returns with payback periods beyond 20 years. Solar energy generation at district schools now appears to be the most cost-effective way to reduce MGSD's environmental footprint and provide significant operational cost savings.

Construction of two energy efficient facilities with geothermal HVAC

In addition to upgrading and retrofitting existing buildings, MGSD has had two new school construction projects in the last 12 years. Both buildings were designed to exceed LEED silver standards. The most recent building (currently under construction) has a geothermal HVAC system that is anticipated to have a 69% reduction in energy usage and 423 Metric tons of GHG emission reductions compared to standard building codes. These new construction projects represent a significant commitment to shrink MGSD's environmental footprint. The projects also allowed for a significant reallocation of operational funds from energy expenditures to educational investments that directly impact student learning.

Sustainability Committee

To extend sustainability and energy planning efforts MGSD created a committee of community members, board members, staff and students, with experience and interest in furthering MGSD's sustainability practices and goals. The committee's charge included evaluation of the energy efficiency and

sustainability of district facilities and planning for the implementation of renewable energy generation and sustainable practices.

The MG High School solar PV system is part of a larger district plan

This MG High School solar project is part of a larger plan for district wide comprehensive renewable energy. It is expected that this project will serve as a launch point and a model for a buildout of sustainably sourced energy for district buildings in the upcoming years. Ultimately, Monona Grove aims, and has begun feasibility studies, **to install solar photovoltaics on every facility in MGSD.**

3.4.8. Energy Resiliency

MG High School is community center and shelter in emergencies

MG High School is registered with the Red Cross as a community response operations center, emergency supplies storage and distribution facility, and shelter location in the event of natural disasters or public emergencies. The high school is equipped with a diesel backup generator that can support critical loads at the school even in the absence of grid power. The generator is connected to the building's electrical system with an open transition (break-before-make) switch that prevents back feeding of the generator onto the utility lines in the event of a grid outage. The proposed solar installation prepares MGSD to add significant benefits to improve the resiliency of the facility and enhance its function as a Red Cross Shelter during local emergencies.

The DC to AC inverter equipment that will be purchased for the project will have the capability to provide grid stabilization services (frequency regulation and voltage support). Although these functions are not allowed under the current WI interconnection guidelines, these rules are presently being revised to adopt new IEEE 1547-2018 standards for distributed generation equipment. Once the state's interconnection guidelines have been updated, MGSD will enable these functions through software setting changes. This will help to make the local distribution grid more resilient to voltage and frequency fluctuations and other transient events that might occur during events that impact the grid.

Although the MG High School solar photovoltaic system does not include energy storage technology, the PV system will be designed as "storage ready". This includes considerations such as the selection of DC to AC inverter technology that is battery compatible, sizing of DC to AC inverters and AC subpanels to accommodate additional battery power, and informed decision making about the location of system hardware to provide access and proximity for a future battery installation. MGSD anticipates adding a battery energy storage system at the point where the financial and environmental benefits converge. Events that would accelerate the adoption of battery technology include updating of the PSC interconnection rules to address and clarify energy storage regulations, utility programs that encourage battery installation, a reduction in the cost of battery storage equipment, new grant incentives for battery storage, and/or the need to replace the existing back-up generator when it nears the end of its planned operating life.

3.4.9. Education and Awareness

This project will engage students in purposeful project-based learning, offer professional development for faculty, and provide a platform for community outreach. Through partnerships with local colleges, MG High School faculty will develop curriculum that educates students about energy economics, solar technology, environmental science, environmental and energy justice, and develops leadership skills and career pathways.

MGSD will partner with Madison Area Technical College and the Center for Renewable Energy Advanced Technological Education (CREATE), led by Dr. Kenneth Walz.

The CREATE program provides renewable energy continuing education for high school science, technology, engineering, and math (STEM) teachers, enabling them to prepare students for the growing field of clean energy jobs. The proposed PV project will be leveraged, in concert, with curriculum development to maximize the educational benefits and potential for creating future leaders. The CREATE coursework provides professional development to integrate solar PV technology across the curriculum. Solar concepts will be woven into various courses at MG High School including science offerings and a wide range of technology, engineering, and business coursework. This project energizes the Monona Grove community to implement a comprehensive curriculum that includes the importance of sustainability and career opportunities in a rapidly growing field.

MGSD will work with Edgewood College's Sustainability Leadership Program (SLP), to expand existing curriculum about environmental justice. MG High School students are already exposed to the concepts of race, equity and its connection to climate change. The SLP curriculum provides a deeper understanding of ecological sustainability, explores the intersectionality of climate change and social justice, and presents various leadership tools and models to help students implement change at a larger, systems level. With assistance from Edgewood College professors, we will expand our high school material and explore how to adopt portions of this graduate level course to a high school audience, including the potential for more project-based learning.

Increase engagement through student-led projects for a more comprehensive education.

MG High School has a history of successful student-led sustainability projects through our environmental science course offerings. Students in these classes take part in designing projects on behavior modifications, system changes, and raising funds to make our community more sustainable. Past projects have led MGSD to add water bottle refilling stations around the school, swap out paper towels for electric hand dryers in bathrooms, remove disposable plastics from school cafeterias, and create a system that encourages students to carpool to school. Plans for student involvement does not stop with solely science and technology. Students enrolled in business courses will also experience a curriculum directly related to this project by gaining insight into the monetary benefits of sustainability practices. Economics and Marketing students will drive fundraising and community engagement and outreach efforts, and all students will be challenged to see the interconnected nature of climate change and social justice. Our strategy and structure will serve as a model that other schools will enthusiastically adopt.

The MG High School site serves as the central hub of MGSD. Families, young children, and outside communities make regular trips to the high school to attend events. This site has high visibility and renewable energy awareness will ultimately grow because of this project and its scope, and MGSD will leverage that awareness to make improvements to sustainable behavior using the curriculum previously outlined.

3.4.10. Innovation

This MG High School Solar Project seeks to innovate by providing and communicating a transformative model for other school districts that is both relatable and practical.

Renewable energy needs to rapidly replace greenhouse gas emitting fossil fuels to keep up with energy demand while avoiding the most dire effects of climate change. Yet significant impediments limit widespread adoption of renewable solar PV in Wisconsin Schools. While technological and cost barriers have steadily decreased in the last several years, intangible barriers remain. These include lack of experience, a focus on an educational mission, aversion to risk, and public skepticism.

The intended innovation of this project is to overcome these limits to effectuate widespread adoption, starting with the MGSD but impacting schools throughout the state. This is accomplished by executing large-scale solar project that sets a standard, utilizes familiar tools to be readily replicable, and communicates a successful proof of concept that demystifies and normalized this process through robust outreach and enhanced curriculum that supports future projects.

This project will set a standard for sustainable solar development for Wisconsin schools districts

To serve as a standard in Wisconsin schools a solar PV project must include three factors: scale that targets significant reductions, functions with existing infrastructure, and reliance on common and available financial and operational tools.

The MG High School solar PV system will be the largest on a K-12 school facility in Wisconsin (**Table 2**). The size of the system is designed meet a district-wide goal of 50% reduction in grid provided power (**Section 3.4.4**), rather than the constraints of net-metering, fundraising, tax credits or other financial considerations. Like most of Wisconsin's 1590 schools the MG High School has a service life expected to last well beyond 2050 and typifies Wisconsin school facilities in many ways. By self-funding this project (**Sections 3.4.2, 3.4.3**) (with the addition of 25% in EIGP and FOE grants), *MGSD will receive the full financial benefit* of the reduction in grid powered electricity and make a significant step towards sustainability, without the complexities of recruiting investors or other fundraising sources. Reference **3.4.6** for the role the EIGP funds play in pulling this project forward in time.

In addition, MGSD has significant experience implementing energy efficiency and has developed (with this project) a path towards a 50% reduction in grid provided power. This will provide a concrete demonstration of how solar PV can fit into the larger picture of sustainable development.

This project will create an attractive model that other districts can replicate

Widespread implementation in school communities necessitates examples and models to ease the process of adoption. The MG High School solar project will provide a high visibility flagship installation that convincingly demonstrates the combination of energy efficiency and solar photovoltaic technology as financially attractive and advantageous to districts that seek to reduce airborne pollution, address carbon emissions and lower operating costs. By upgrading an existing facility and utilizing familiar financial tools this project will serve as a model that will be replicated both locally, on other MGSD facilities, and school Districts in the state of Wisconsin.

This project will support significant outreach that develops future projects

From the outset the MGSD Sustainability Committee has included a focus outside our own district. With goals not only to benefit from our own sustainability but to assist other Wisconsin schools by providing leadership and models for them to study and adopt. Without outreach the MG High School Solar Project would serve only local goals, but not this larger intent. MGSD has in the past provided outreach on the success of its energy efficiency efforts and will build on an expanding network of resources.

One specific example of this work already began in the autumn of 2019 MGSD reached out to the Executive Director of the Dane County Office of Energy and Climate Change, Kathy Kuntz, and shared our goal for working with other school districts. Together with Ms. Kuntz and other area experts, in early 2020 we hosted a one-day gathering of Dane County School District Business Managers to listen to the challenges and concerns they face, and to share resources and some impressive success stories. The event was well-attended with 14 districts represented, and it set the stage for MGSD to continue working with these professionals as this project progresses.

MGSD has developed relationships with Madison College's CREATE program, Edgewood College's Sustainability Leadership program, and considers Wisconsin's K-223 Energy Education Program, Focus

on Energy, Green and Healthy Schools, Cool Choices and WASB as partners for outreach. The Wisconsin Association of School Boards and presentations at their annual meeting are a most effective way of reaching key players in Wisconsin schools. A comprehensive list of existing and potential outreach partners can be found in the attached stakeholders registry.^{xix}

Differentiation from other Wisconsin school solar projects

Other K-12 solar PV projects in the state that are of comparable size have been largely privately funded (Deerfield^{xx}), engaged private investors to capture federal solar investment tax credits (Deerfield, Northland Pines^{xxi}), or made use of large new building construction referenda (Oregon^{xxii}) (**Table 3**). Although these techniques are useful, they limit the financial benefit available to schools, and introduce several constraints and complexities that generally limit their present application to isolated projects. In addition, the federal solar tax credit program will eventually be phased out, making this option only viable in the near term. The school solar project most comparable to that proposed by MG High School was completed by Lakeland Union HS^{xxiii} utilizing the now expired ACT 32 energy efficiency funding. Net metering agreements have helped with the financial viability of a number of smaller school solar PV projects in Wisconsin, but these are limited in size to target maximum allowable net metering.

Table 3 Largest K-12 solar PV installations In Wisconsin

Installation Owner or Host	County	kW(DC)	Year	Funding
<i>MG High School</i>	<i>Dane</i>	<i>674.7</i>	<i>2021</i>	<i>District 75% funded, 25% grants & incentives</i>
Oregon Forest Edge Elementary	Dane	650	2020	New construction referendum
Deerfield Middle-High School	Dane	474	2018	Privately Owned, solar investment tax credit
Northland Pines High School	Vilas	330	2017	Private-Public COOP, solar investment tax credit
Lakeland Union High School	Oneida	280	2016	Act 32 Energy Eff. Funding

Finally, this project provides an innovative approach to equity education

Unfortunately, MGSD has struggled with issues related to racism, injustice and inequity. Addressing these issues has been a priority for several years. The concepts of energy and environmental justice are inextricably linked with social justice. Introducing and developing these concepts in the context of MGSD sustainability projects presents an innovative way and educate students in serious societal challenges. The developing relationship with Edgewood College’s Sustainability Leadership program is key to this element.

This project’s key outcome will be to inspire other schools to pursue their own sustainable energy projects, and to enable them to execute these plans by sharing the accumulated experience, tools, strategies, and resources, developed by Monona Grove School District with this grant award.

3.5 Reference Materials:

The following pages contain materials referenced in this application.

Pages 18-20: Endnotes

Pages 21-23: [Appendix A \(Helioscope Report\)](#)

Pages 24-26: [Appendix B \(List of Stakeholders\)](#)

Page 27-28: [Resume of Mr. Jerrud Rossing](#)

Page 29-40: Letters of support from Key Stakeholders:

1. [Chair of MG High School Science Department, Christy Frontier](#)
2. [Monona Grove School District Administration, Superintendent Dan Olson, Ed. D](#)
3. [Village of Cottage Grove Board of Trustees](#)
4. [Mayor of Monona, Mary O'Connor](#)
5. [Dane County Office of Energy & Climate Change, Director Kathy Kunz](#)
6. [Wisconsin K-12 Energy Education Program, Director Anna Haines, Ph.D.](#)
7. [Midwest Renewable Energy Alliance, Executive Director Nick Hylla](#)
8. [Madison College CREATE, Director Ken Walz, Ph.D.](#)
9. [Monona Grove student Olivia Stauffacher](#)
10. [Dane County Board Supervisor, Melissa Ratcliff](#)
11. [Edgewood College Sustainability Leadership Program, James Lorman, Ph.D.](#)

Endnotes

ⁱ DPI School Financial Data (2006-7) https://dpi.wi.gov/sfs/reporting/safr/annual/data-download#Annual_2006-2007

ⁱⁱ MGSD support for Energy Efficiency projects: <http://www.mckinstry.com/2009/03/01/monona-grove-school-district-throws-unanimous-support-behind-more-energy-efficient-schools/>

ⁱⁱⁱ List of energy efficiency projects 2009-present

Projects	Monona Grove HS	Cottage Grove ES	Taylor Prairie ES	Winn. MS	Nichols	Glacial Drumlin ES	District Office
Phase 1 - 2008 Energy Savings \$124,416							
Exterior Lighting LED	X	X	X	X			X
Vending Misers	X	X	X	X			
Variable Frequency Drives	X	X	X				
Pool Cover	X						
Building Envelope	X	X	X	X			
Controls Optimization	X			X			
Retro- Commissioning	X			X			
Phase 2 - 2010 Energy Savings \$82,540							
HVAC Upgrades					X		X
Variable Air Volume		X					
Lighting (T8/Delamp)			X			X	X
Building Envelope						X	X
HVAC Controls – MGHS	X						
Pool Mechanical Unit – MGHS	X						
Destratification Fans – MGHS	X						
Heat Pumps			X				
Dehumidification (VRF)				X			
Boiler Replacement							
Water Conservation	X	X	X	X	X	X	X
Phase 3 - 2014 Energy Savings \$18150							
HVAC Upgrades		X					
Window Replacement		X	X	X	X		
New NG Generator		X	X		X		
Stadium/Stage Lighting Upgrades	X						
DDC Conversion		X			X		
Replace Chiller					X		
Electrical Upgrades					X		
Exterior/Interior Lighting (LED)					X		
Tuck Pointing					X		
Phase 4 - 2019							
Boiler Plant Replacement	X						
Phase 5 - 2020 Energy Savings - \$31,385							
LED Lighting Retrofit	X						

^{iv} Granite Ridge School <https://www.mononagrove.org/grs/>

^v Madison College CREATE program: <https://atecentral.net/r31866/>

^{vi} Edgewood Sustainability Leadership Program <https://www.edgewood.edu/about/mission-identity-vision/sustainability>

vii Monona Grove School District Website www.mononagrove.org

viii Monona Grove DPI score card: https://apps2.dpi.wi.gov/reportcards/get-file?level=district&distKey=008640&fileName=DRC_Public_Monona_Grove_2018-19_8640.PDF

ix Sustainability committee bios

Sustainability Committee Members:

Lisa Gundlach: Monona community member with children in MGSD; Monona Public Works Committee Member; Former Secretary of the Friends of the Monona Senior Center; Senior Director of Development at UW Foundation with over 12 years of development experience.

Cynthia A. Kelm-Nelson, Ph.D., Scientist at UW-Madison, Department of Surgery, Principal Investigator with over \$5.5M in current NIH grant funding. Resident of Cottage Grove, with two young children in MGSD.

Tyler Kuehl, Science Teacher, MG High School, 2016 MG High School Teacher of the Year and history of leading successful student-driven sustainability projects.

Peter Sobol, School board member 12 years, Engineer, authored successful \$2M ARRA compliant grant application.

Kenneth Walz, Ph.D., Renewable Energy Program Director at Madison Area Technical College. Principal Investigator for over \$10M in federal and state renewable energy grants, including several that funded solar photovoltaic projects on school facilities.

Lynn Laszewski has over 25 years of experience leading Resource Conservation and Sustainability programs for companies such as Newell Rubbermaid, HP, Ball Aerospace, and most recently PepsiCo. While working for these companies, Lynn has developed and implemented product design for environment programs, incorporated environmental performance into plant production processes and instituted policy to improve environmental achievement.

Matthew Bittorf: Auditorium Director - MG High School, Monona community member and MG High School alumni, Atmospheric and Oceanic Science Degree from University of Wisconsin - Madison.

Teresa Radermacher is a citizen member of the City of Monona Sustainability Committee, where she led the successful adoption of the city's first Resolution for 100% Clean Energy, and has since worked to implement its targets. She founded and chairs the Wisconsin Department of Administration's first Green Team where she works to educate and engage state employees around matters of sustainability and implement projects to support Governor Ever's goals for a clean-energy Wisconsin.

Olivia Stauffacher, attends MG High School, class of 2022

x DNB McKinstry Information: https://www.dnb.com/business-directory/company-profiles/mckinstry_co_llc.1f9ce42db69323c076ce4fbdb91ff9f7.html

xi List of McKinstry local completed and/or under development solar PV projects in Wisconsin

City of Wauwatosa – Public Works Building	371.2 kW Roof Mount solar PV
Algoma School District	185.6 kW Ground Mount solar PV
WI Dells School District	49.3 kW Roof Mount solar PV
Kimberly School District	60.4 kW Roof Mount solar PV
Green Lake School District	17.0 kW Roof Mount solar PV
Cambridge School District (under development)	264.1 kW Roof Mount solar PV
UW-Platteville (under development)	2.4 MW Ground Mount solar PV
UW-Stevens Point (under development)	358 kW Roof Mount/Carport solar PV
UW-Superior (under development)	1.1 MW Ground Mount solar PV

xii NREL Solar installed system costs <https://www.nrel.gov/analysis/solar-installed-system-cost.html>

xiii EPA Green house Gas Calculator: <https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator>

xiv EPA AVERT Tool <https://www.epa.gov/statelocalenergy/avoided-emissions-and-generation-tool-avert>

xv Sustain Dane Website <https://sustaindane.org/>

^{xvi} American Lung Assoc. Impact of Asthma <https://www.lung.org/lung-health-diseases/lung-disease-lookup/asthma/learn-about-asthma/impact-of-asthma>

^{xvii} Dane County Air Quality Report Card <https://publichealthmdc.com/documents/2014RptCardAir.pdf>

^{xviii} FOE [Commercial and Industrial | Focus on Energy](#)

^{xx} Deerfield Solar Project: https://www.hngnews.com/cambridge_deerfield/article_50be73a3-653b-5a09-bcd2-7d151720fbb7.html

^{xxi} Northern Pines Solar Project: <https://www.npsd.k12.wi.us/district/solar-project.cfm>

^{xxii} Oregon Forest Ridge Elementary School Solar Project <https://www.oregonsd.org/Page/22>

^{xxiii} Lakeland Union High School Solar Project <https://energyonwi.extension.wisc.edu/2019/10/09/lakeland-union-high-school-solar-array/>

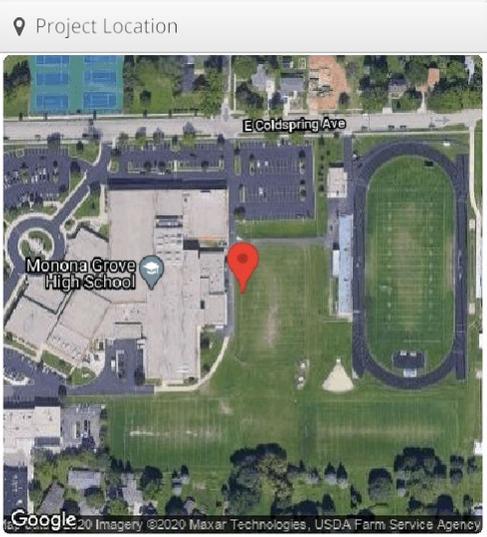


MGHS - Larger Size - BSS 20201228 Monona Grove High School, 4400 Monona Drive, Monona,

System Metrics

MGHS - Larger Size - BSS 20201228

Module DC Nameplate	674.7 kW
Inverter AC Nameplate	540.0 kW Load Ratio: 1.25
Annual Production	853.7 MWh
Performance Ratio	82.6%
kWh/kWp	1265.2
Weather Dataset	TMY, MADISON DANE CO REGIONAL ARPT (SI); NSRDB (tmy3, I)
Simulator Version	555f6e81ee-3aa015a629-77ca1bf923-e534123303

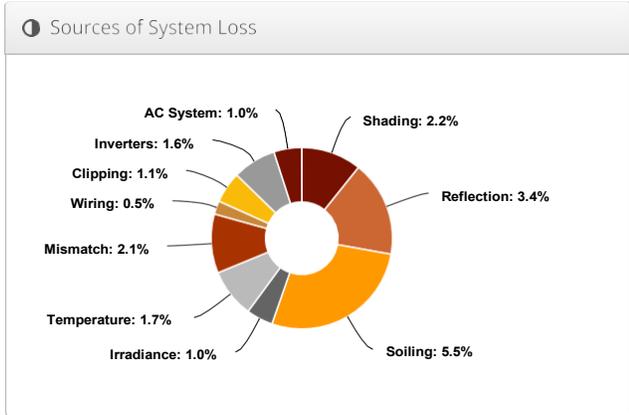
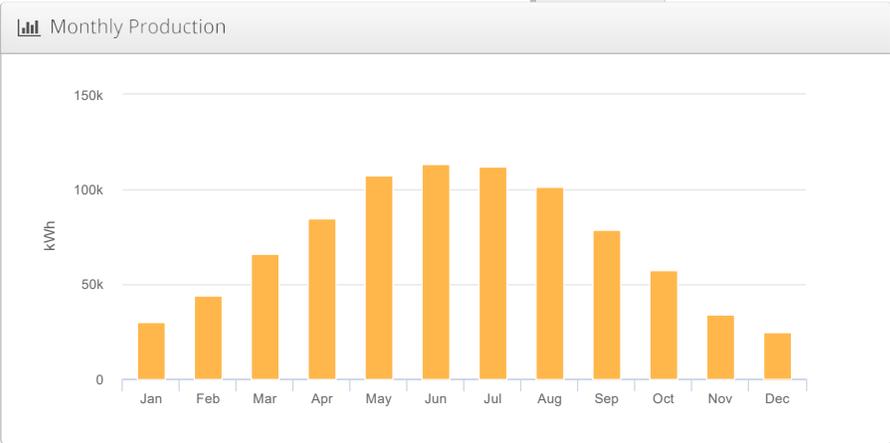


Report

Project Name: Monona Grove High School

Project Address: 4400 Monona Drive, Monona, WI 53716

Prepared By: Mayur Patel
mayurp@mckinstry.com



Annual Production

Description	Output	% Delta
	(kWh/m ²)	
Annual Global Horizontal Irradiance	1,427.4	
POA Irradiance	1,532.5	7.4%
Shaded Irradiance		
Irradiance after Reflection	1,447.8	-3.4%
Irradiance after Soiling	1,367.5	
Total Collector Irradiance	1,367.5	0.0%
Output at Irradiance Levels	925,730.7	-1.0%
Output at Cell Temperature Derate	909,538.9	
Output After Mismatch	890,243.7	-2.1%
Optimal DC Output	885,953.0	-0.5%
Inverter Output		-1.6%
Energy to Grid	862,323.6	-1.0%
System Metrics	853,700.4	
Avg. Operating Ambient Temp		11.4 °C
Avg. Operating Cell Temp		
Operating Hours		
Solved Hours		4607

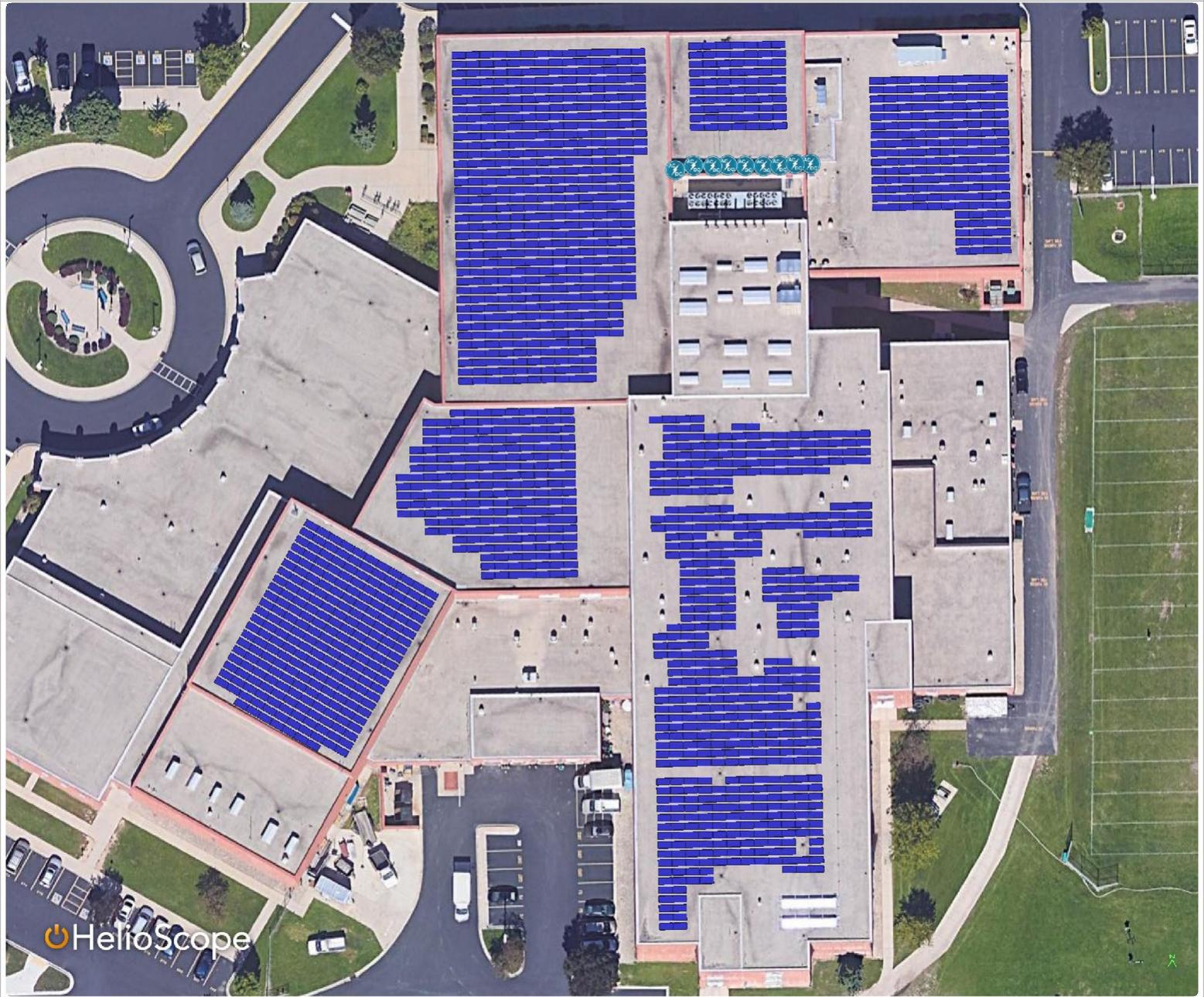
• Condition Set												
Description	Wisc Condition Set v1 - 6Aug19											
Weather Dataset	TMY, MADISON DANE CO REGIONAL ARPT [ISIS], NSRDB (tmy3, I)											
Solar Angle Location	Meteo Lat/Lng											
Transposition Model	Perez Model											
Temperature Model	Diffusion Model											
Temperature Model Parameters	Rack Type	U const				U wind						
	Fixed Tilt	29				0						
	Flush Mount	15				0						
	East-West	29				0						
	Carport	29				0						
Soiling (%)	J	F	M	A	M	J	J	A	S	O	N	D
	30	21	13	6	1	0	0	0	0	1	8	27
Irradiation Variance	3.5%											
Cell Temperature Spread	3° C											
Module Binning Range	0% to 2.5%											
AC System Derate	1.00%											
Module Characterizations	Module	Uploaded By		Characterization								
	JAM72S10-405MR (JA Solar)	Folsom Labs		Spec Sheet Characterization, PAN								
Component Characterizations	Device	Uploaded By		Characterization								
	CPS SCA60KTL-DO/US-480 (Chint Power Systems)	Folsom Labs		Default Characterization								

8 Components		
Component	Name	Count
Inverters	CPS SCA60KTL-DO/US-480 (Chint Power Systems)	9 (540.0 kW)
Strings	10 AWG (Copper)	98 (41,931.7 ft)
Module	JA Solar, JAM72S10-405MR (405W)	1,666 (674.7 kW)

d., Wiring Zones			
Description	Combiner Poles	String Size	Stringing Strategy
Wiring Zone	15	17-17	Along Racking
Wiring Zone 2	15	17-17	Along Racking
Wiring Zone 3	15	17-17	Along Racking
Wiring Zone 4	15	17-17	Along Racking
Wiring Zone 5	15	17-17	Along Racking

m Field Segments									
Description	Racking	Orientation	Tilt	Azimuth	Intrarow Spacing	Frame Size	Frames	Modules	Power
Field Segment 1	Fixed Tilt	Landscape (Horizontal)	10°	178.814°	1.2 ft	1x1	474	474	192.0 kW
Field Segment 3	Fixed Tilt	Landscape (Horizontal)	10°	178.801°	1.2 ft	1x1	204	204	82.6 kW
Field Segment 4	Fixed Tilt	Landscape (Horizontal)	10°	178.801°	1.2 ft	1x1	510	510	206.6 kW
Field Segment 5	Fixed Tilt	Landscape (Horizontal)	10°	178.801°	1.2 ft	1x1	70	70	28.4 kW
Field Segment 6	Fixed Tilt	Landscape (Horizontal)	10°	178.801°	1.2 ft	1x1	170	170	68.9 kW
Field Segment 6	Fixed Tilt	Landscape (Horizontal)	10°	209.70142°	1.2 ft	1x1	238	238	96.4 kW

📍 Detailed Layout



Appendix B: Stakeholder Registry

Stakeholder	How we engage	For this Desired Outcome
District Administrator and Business Manager	Direct involvement in project Requires regular updates from the contractor and project PM	District Admin and Business Manager become go-to resources for other districts seeking to do the same.
District Facilities Manager, Custodial Team	Collaboration with solar installer for needed training and awareness. Site walk-through and energy education program from Focus on Energy Energy Star Portfolio Manager training and use	Reduced energy consumption. Employees are empowered, engaged, proud.
District Communications Manager	Primary liaison for all project communication. Provide regular updates on project status to assist with press releases, email communication, website updates	Anyone wanting to know about this project can easily find the information and resources they need.
Marketing Faculty Environmental Sciences Faculty	Leverage existing Marketing course to create and implement student-led community outreach campaign Training for Env Sciences faculty through Madison College and the Center for Renewable Energy Advanced Technological Education (CREATE). Continue to meet with Edgewood rep to incorporate Environmental Justice and leadership materials into existing curriculum	Increased community awareness in two communities Students gain real-world, project-based experience Clean energy training is integrated into HS curriculum More MG graduates enter clean energy fields; More renewables in Wisconsin A more equitable and just world
Faculty, staff and students at all MG schools	Keep informed on project status through regular updates. Offer tours, fieldtrips to the HS to see the project and learn about it.	Grow excitement about the project, at all levels
OTHER SCHOOL DISTRICTS		
Dane County School District Business Manager's Work Group	Continue on-going work with this group; Provide regular project updates; Host a second "Solar Summit" in 2021.	More Dane county school districts move forward with clean energy projects.
Sun Prairie School District Energy Manager	Continue on-going relationship. MG Custodial Team visits SP to learn about energy management	MG Custodial team learns from peer how to become Energy Managers. Sustained energy reduction in MG District
Sun Prairie School District Energy Manager	Explore what a shared position might look like. One Energy Manager for multiple districts, a low-cost approach for schools who cannot afford their own, on-site Energy Manager	Reduced energy consumption at more schools. Potential model to replicate
Custodial teams from Dane county school districts	Invite to High School during and after project completion for tours of the mechanicals and other system hardware.	More awareness, familiarity and comfort w solar spreads throughout the county. MG Custodial team is empowered, included, proud.
Madison West High School Green Team	Continued contact with alumnae	Relationship building
COMMUNITY / GOVERNMENT		
Monona Grove Education Foundation	Keep informed on project status, especially curriculum opportunities and changes; Provide facility tours; Invite to special events. Project representatives to present at annual MGEF Gala	New curriculum is financed by the Foundation

Appendix B: Stakeholder Registry

Dane County Office of Energy and Climate Change	Co-host of the 2021 "Solar Summit" to Dane County Business Administrator's work group; Publicity of project through Dane county communication vehicles, website, newsletter, social media.	Solar projects throughout the county become more familiar and frequent.
City Council and Sustainability Committees in City of Monona and Cottage Grove	Provide regular updates on project status; invite for site tours, and to special events; Community-wide promotion of project through city vehicles, website, newsletter, social media; Share lessons learned with city officials, department heads, and advise on future municipal projects	Increased public education, awareness, support, buy-in Future municipal projects are easier to implement
Community members with professional marketing, communications experience	Use school communication channels to solicit members to form an ad-hoc committee to assist student campaign, provide guidance and ensure targets are met.	Student-led community outreach campaign is successful
Monona Public Library	Partner with Eco-Action Tuesday program to create community forums about solar energy and this project specifically	Increased public education, awareness, support, buy-in
WVMO Radio station	Work with station staff to create PSAs, and other programming relevant to this project	Increased public education, awareness, support, buy-in
Dane County Board Members from Monona and Cottage Grove	Provide regular updates on project status; invite for site tours, and to special events; Ask that updates be shared with full Dane County Board	Increased public education, awareness, support, buy-in
Business Owners in Monona and Cottage Grove	Regular project updates for education and awareness	Possibly financial donations, Monona businesses increase participation in the city's Sustainable Business Initiative.
Sustainability Committees in neighboring communities; Middleton, Fitchburg, McFarland	Provide regular updates on project status; invite for site tours, and to special events; make project information available.	Increased public education, awareness, support, buy-in
EDUCATIONAL RESOURCES, PARTNERS		
Madison College, Center for Renewable Energy Advanced Technological Education (CREATE)	Professional development to MGSD staff and faculty	A CREATE STEM Educator Solar Institute is developed at Monona Grove High School; More MG graduates enter the clean energy field; More clean energy is created.
Edgewood College, Sustainability Leadership Graduate program	Partner to adopt graduate level, environmental justice and leadership curriculum for HS audience	More MG graduates acknowledge the intersection of race and climate change; and have the leadership tools to affect positive change.
KEEP - Wisconsin K-12 Energy Education Program	Ask reps to bring workshops to our school, to assist in creating energy curriculum for elementary and middle school, not just High School.	New curriculum is developed for all MG students. Clean energy becomes widely understood and accepted by young people.
Focus on Energy	Collaboration with and regular project updates to Chris Seitz, our Energy Manager; Building occupant - energy education program	MG Admins, Facilities professionals learn how to maximize our energy use
Green and Healthy Schools	District to register with these organizations, provide updates on our energy use	we receive recognition and assistance in promoting our green power use, assistance with curriculum
Cool Choices	Bring this program to all schools in the district	Increase awareness of sustainable life choices, not just clean energy

Appendix B: Stakeholder Registry

PROFESSIONAL ORGANIZATIONS		
Wisconsin Association of School Boards	Presence at annual state-wide conference	Increase awareness of this project and the model it offers to other interested districts, connect with decision makers in other districts.
RENEW Energy Summit	Presence at annual conference	
MREA - Midwest Renewable Energy Association	Presence at annual Energy Fair Continue working with Solar on Schools program representative	
Sustain Dane	Present at annual conference	
Monona Herald Independent	Provide regular updates via press release	Increase community awareness, buy-in
Focus on Energy	Collaboration with and regular project updates with our Energy Manager; Building occupant - energy education program	District takes advantage of all services, grows internal capacity, knowledge
WAE - Wisconsin Association of Environmental Educators conference	Present to this platform once we've had a chance to incorporate into our curriculum	Increase awareness of this project and the curriculum resources it offers to other interested districts, connect with decision makers in other districts.
Wisconsin Society of Science teachers		
EPA Green Power Program	District to register with these organizations, provide updates on our energy use	we receive recognition and assistance in promoting our green power use
Green and Healthy Schools		Further assistance with curriculum ideas
Cool Choices	Bring this program to all schools in the district	Increase awareness of sustainable life choices, not just clean energy
Monona East Side Business Association, Cottage Grove Chamber of Commerce	Provide project updates and resources for those interested in sustainable change; Present at luncheons, meetings.	Renewable energy awareness is increased among our business community, and adopted.
Madison area renewable energy professionals	Build partnerships to bring Career Day events to High School, summer jobs, and apprentice programs	More student connections to green energy fields
Sierra Club, Local chapter	Provide project updates, ask for broadcast updates to their members through website, email, newsletters and social media	Increase awareness of this project, the curriculum and resources it offers to other interested parties.
350.org, Local chapter		
Sunrise Madison		
Youth Climate Action Team, local chapter		
Citizens Climate Lobby, local chapter		
WORT's Wisconsin Energy Broadcast	Pitch an idea for a program about this project to hosts Heather Allen and Nan Fee.	
Aldo Leopold Nature Center	Reach out to director for regular project updates possible presentations at events	increase visibility of the project, expand awareness
UW-Madison Nelson Institute	Reach out to director for regular project updates possible presentations at events	Develop new partnerships

Jerrud J. Rossing

Home Address:

413 W. Oak Street
Cottage Grove WI 53527

608-772-6710

jerrud.rossing@mgschools.net

Work Address:

5301 Monona Drive
Monona, WI 53716

*Education:***Certified School Risk Manager Program**

The National Alliance for Insurance Education and Research

February 2012

Master of School Business Management

University of Wisconsin - Whitewater; Whitewater, Wisconsin

December 2009

Continuing Education in Grant Writing

University of Wisconsin - Eau Claire, Eau Claire, Wisconsin

January 2004

Bachelor of Science in Agricultural Economics

Purdue University, West Lafayette, Indiana

May 2002

*International Experience:***Agricultural University of Krakow**

Krakow, Poland

Courses: International Trade, Polish Language, European Union, Polish Agriculture,
Polish Education System, and European Agriculture

January – May 1998

*Current Work Experience:***Director of Business Services**

Monona Grove School District, Monona, WI

Annual Budget: \$54,000,000

Special Projects:

- Passage of \$2,600,000 Operational Referendum
- Passage of \$57,000,000 Facilities Referendum
- Passage of \$930,000 Operational Referendum
- Passage of \$3,100,000 Operational Referendum
- Construction of a \$33,000,000 New Elementary School (Currently in Process)
- Direct and administer the financial management, accounting and budgeting functions of the District
- Serve as the Chief Financial Officer for the District
- Develop multi-year budget forecast for District Superintendent and Board of Education
- Manages and oversees District Cash, Investments and Debit Management
- Provide leadership, direction and development of District policy as it relates to Financial and Operational matters
- Manage and oversee the District purchasing procedures and bidding process of the District
- Administration of the District Risk Management program including school safety
- Supervise and direct oversight of Aquatics, Business Office, Facilities, School Nutrition, and Transportation
- Prepare, assist, and oversee District Annual Audit
- Provide counsel to the District Superintendent and Board of Education on enrollment, financial and policy trends
- Develop and analyze models of assessing the cost of current salary and employee benefits packages and proposals
- Oversight and administration of District Employee Benefit package – Monitoring, Bidding and Recommendations
- Plan, Assist and Development of Professional Development for District Staff
- Support and Communicate with the District Superintendent and Board of Education on financial and operational affairs of the District
- Present financial data to various school and community groups both in written, oral and different media format

July 2010 - Present

Jerrud J. Rossing - Page 2

*Past Relative Work Experience:***Financial Services Manager**

July 2008 – July 2010

Appendix C: Resume of Jerrud Rossing

Hudson School District, Hudson, Wisconsin

Annual Budget: \$58,000,000

Special Projects: Opening of River Crest Elementary School – LEED Gold Certified

- Directed the Financial Services Office on protocol and procedures
- Provided instruction and answered questions related to budget procedures between departments
- Assisted with the development and implementation of the district's budget
- Analyzed financial records of the district
- Coordinated district-wide purchasing of needs supplies, materials and equipment
- Prepared, assisted and oversite of District Annual Audit
- Researched and supported acquisitions of grant for State and Federal funding
- Oversight of the District Duplicating Center
- Prepare and Submitted DPI Financial reports

District Bookkeeper

April 2006 – July 2008

Prairie Farm School District; Prairie Farm, Wisconsin

- Prepare and submit all DPI finance reports
- Serve as the liaison to the Board of Education on financial matters
- Perform and oversee district payroll and accounts payable
- Direct the business office on protocol and procedure
- Maintain all district contracts and employee documentation
- Develop and implement the district's budget
- Analyze and maintain all financial records of the district

Community Education Coordinator

October 2005 – August 2006

Prairie Farm School District; Prairie Farm, Wisconsin

- Planned and organized community educational events
- Facilitated monthly Advisory Board meetings
- Coordinated with other school district community education programs
- Marketed programs to the community

Skills and Knowledge:

- Multi-Tasking, networking, supervision, decision-making, devising and analyzing plans and strategies, time management, anticipating the long-term consequences of decisions, computer applications, organizational, computerized accounting record keeping, self-motivated, communications, team player, strong work ethic, listening, and professional

Activities and Leadership Experiences:

- Wisconsin Educators Risk Management Council – Board Member
- Wisconsin Association of School Business Officials – Member
 - 2019 Mike Roshar WASBO Shining Star Aware Recipient
 - Chairperson of the Madison Area School Business Officials
 - Fall Conference Co-Chair
 - Fall Conference Team Building Chair
 - Presenter:
 - State Jt. Convention: “A Systematic Approach to Budget Reductions”
 - Fall Conference: “Educator Effectiveness and the Business Office”
 - WASBO/WASPA Conference: “Educator Effectiveness Panel”
- Cottage Grove Youth Soccer Club Coach and Treasurer
- Village of Cottage Grove Community Development Authority Committee Member

Monday, January 11th, 2020

To EIP Grant Committee,

On behalf of many of the teachers at Monona Grove High School, we write this letter in support of the proposed installation of a Solar PV system at our school, and the planned curriculum programs associated. We are enthusiastic about our school completing a Solar PV install and the educational opportunities we can provide our students because of it. Completing this project will allow us as teachers to provide a purposeful, engaging, equity-focused, and student-led sustainability curriculum to each and every student that attends our school.

Upon completion of this project, much work will be turned over to the teachers at our school to energize our curriculum to include our new solar array as a focal point in numerous classrooms. Attending trainings, revamping learning goals, creating new hands-on activities, and structuring student-led projects are time-consuming, but the teachers of Monona Grove High School are excited about this opportunity. We know how many jobs will be available to our students in renewable energy in the future. We know how engaging this new curriculum will be. We fully support this project and completing this work.

We believe in the importance of preparing our students for the future, but also in preparing the future for our students. This plan is a large step in accomplishing both of those goals. As adults in these students' lives, we are enthusiastic about showing them the steps we as a district are taking to become more sustainable. Moreover, we are always working to make the world a better place for our students, and we can't think of much that would have more of an impact on that than this project. We are fully in support of our school pursuing this grant, installing a Solar PV system, and creating a curriculum to educate and share with our students and community.

Sincerely,

A handwritten signature in cursive script that reads "Chrissy Frontier".

Science Department Chair
Monona Grove High School



Monona Grove School District

"Promoting Excellence for Global Opportunities"

5301 Monona Drive • Monona, WI 53716-3199

Phone: 608-221-7660 • Fax: 608-221-7688

www.mononagrove.org

January 19, 2021

RE: Monona Grove High School (MGHS) Solar Project Grant Proposal

To Whom it May Concern:

As the Superintendent of Monona Grove School District, I would like to affirm our strong commitment to the goals and objectives for the proposed Monona Grove High School Solar Project grant proposal. Monona Grove School District is proud to demonstrate its leadership in renewable energy and environmental sustainability and we are eager to share our experience as a model for other districts.

Since 2008 the Monona Grove School District has been engaged in a continuous effort to improve the sustainability of district facilities through significant energy and operational efficiency enhancements. We view this project as an important next step in the district's path towards meeting public expectations for reducing dependence on fossil fuels and responsible fiscal management.

Monona Grove School District commits to delivering the necessary infrastructure and in-kind staff support time to successfully implement project activities. This also includes the allocation of faculty preparation time for professional development and lesson planning to integrate solar technology and environmental sustainability across the curriculum.

The new Monona Grove High School solar installation will be the largest rooftop solar system on a Wisconsin high school, and we are eager to use this as a resource for teaching both students and faculty from our district and from other institutions about renewable energy technology.

It is with great enthusiasm that I lend my full support to this project, and I affirm that Monona Grove School District understands and will fulfill its commitments as stated in the application should the district receive this award.

Respectfully,

Daniel W. Olson, Ed.D.
Superintendent

January 19, 2021

RE: The Monona Grove High School Solar Project

To the Energy Innovation Grant Review Panel:

As Mayor of the City of Monona, and on behalf of the Monona City Council, I am pleased to be writing in full support of the Monona Grove School District's Energy Innovation Grant application and the Monona Grove High School Solar Project.

On January 19, 2021, upon recommendation from the City of Monona Sustainability Committee, the Council unanimously approved Resolution No. 21-1-2462 authorizing this letter of support, and the commitments contained herein, to ensure the Project's success and integration into our overall community commitment towards 100% Clean Energy.

This Project, and our School District, are setting extraordinary examples for our two communities, Monona and Cottage Grove, not to mention other school districts throughout Dane County and the state. We're especially pleased to learn of new components planned for the High School curriculum that will build future leaders in the critically needed fields of not only clean energy but also environmental justice, two needed components of true sustainability, and sustainable societies.

The District's commitment echoes our own clean energy goals and our *Resolution to Address Climate Change through 100 Percent Clean Energy and Resilience*, which our City Council passed unanimously in early 2019, and has been working since to meet. Whether school, municipality or residence, we all share the same air, water and soil, and the District's commitment to reduce their reliance on fossil fuel helps us all move toward a cleaner, safer, healthier community.

Commitments we are making in support of this Project include:

- City staff and/or members of our Sustainability Committee connecting with the District's Sustainability Committee so that lessons learned may be shared and replicated as needed for future solar projects within Monona. This may include attending Project related events, inviting members of the Committee to provide regular Project updates, and seeking their counsel and input on future municipal solar projects.
- Engaging and educating citizens of Monona about this Project and its value through various media outlets. This starts with our crowning jewel, WVMO, "the voice of Monona" our very own award-winning community radio station, where PSAs and feature programs will be created.
- Coordination with the Monona Public Library, and more specifically their successful "Eco-Action" program, to hosting forums for discussions about solar energy, this project, the curriculum, and other related topics.
- Leveraging our City website and social media channels to advertise special events, programming, project milestones and outcomes.

VILLAGE OF COTTAGE GROVE

221 E. Cottage Grove Road Cottage Grove, WI 53527



January 18th, 2021

RE: Monona Grove High School Solar Project
Energy Innovation Grant Review Panel,

The Village of Cottage Grove Village Board and Ad-Hoc Sustainability Committee would like to express our utmost support and encouragement for the Monona-Grove School Districts project of putting a 674.7KW rooftop solar PV array on the Monona-Grove High School.

This inspiring project will set an example for other school districts, municipalities and businesses in Dane county and the State. Equally important will be the impact this project will have on the students of Monona-Grove. This project will allow high school students to learn about sustainability, electricity and engineering. Furthermore, the Monona-Grove Sustainability committee has partnership will higher education campuses such as Madison College and Edgewood college to develop a curriculum and provide training in the fields of electrical engineering and fields related to this solar project. This integrated and thorough approach is fully supported by our Village Board and Ad-Hoc Sustainability Committees.

We are also extremely excited for this project because of what it could do for our community. With our Ad-Hoc Sustainability committee being newly formed (2020), the leadership and openness of the Monona Grove Sustainability Committee has been essential for own Village's sustainability plans. The lessons learned from supporting Monona-Grove's project will allow our own solar projects to proceed with fewer complications and at a faster timescale, allowing us to meet our sustainability goals of reducing our net annual electrical consumption for Village operations to 50% of 2020 levels by 2030 and 100% by 2040.

The Cottage Grove Village Board and Ad-Hoc Sustainability Committee fully support this project and fully anticipate that this project will be catalyst for other school districts, municipalities and businesses to complete solar projects of their own in the near future. We encourage the Energy Innovation Grant Review Panel to recognize the merit and significance of this well-thought out and impactful proposal submitted by the Monona-Grove Sustainability committee.

Village of Cottage Grove

A handwritten signature in black ink, appearing to read "John Williams", written over a horizontal line.

John Williams, Village President & Ad-Hoc
Sustainability Committee Member

VILLAGE OF COTTAGE GROVE

221 E. Cottage Grove Road Cottage Grove, WI 53527



Troy Allen, Village Trustee
Jeffrey Lennberg, Village Trustee
Heidi Murphy, Village Trustee & Ad-Hoc
Sustainability Committee Member
Melissa Ratcliff, Village Trustee
Sarah Valencia, Village Trustee
Paul VanderVelde, Village Trustee
Nicholas Hess, Ad-Hoc Sustainability
Committee Chair
Catie Malcheski, Ad-Hoc Sustainability
Committee Member
Jenny Rogers, Ad-Hoc Sustainability
Committee Member

We trust the members of the Energy Innovation Grant Review Panel recognize that the benefits of this Project reach far beyond the MG District. And the City of Monona is prepared to do our part to help lay the groundwork for additional advancements and future projects to come.

Respectfully,

Mary O'Connor
Mayor, City of Monona



January 15, 2021

Public Service Commission of Wisconsin
Office of Energy Innovation
Madison WI 53705

Dear Members of the Grant Selection Committee,

On behalf of Dane County's Office of Energy & Climate Change, I am pleased to submit this letter in support of the Monona Grove School District's request for an Energy Innovation Grant.

Monona Grove School District is proposing to install a solar energy system at their high school as part of the district's broader energy efficiency and clean energy efforts. They aim to use the project to spur additional energy innovations at their district and at other school districts across the state.

As you may know, Dane County has committed to an ambitious path where we aim to achieve countywide carbon neutrality by 2050. That means, of course, that every community in Dane County and all elements within our communities need to do their part to transition to a clean energy economy. School districts are an influential part of every local community; school districts can influence families and businesses in a variety of positive ways. Accordingly, our office is very supportive of efforts like this one.

Dane County established our Office of Energy & Climate Change in 2017 and since then we have worked closely with local governments and school districts to support clean energy initiatives. In the last year we have increased our outreach and engagement with local school districts, working closely with the team at Monona Grove in particular. If Monona Grove's proposal is funded and they are able to install a solar energy system, our office will certainly support their efforts. We maintain both a Clean Energy and Climate Champions map where we showcase projects like this one and we also publish local success stories. Via these and other channels we would aim to leverage Monona Grove's experience to inspire yet more clean energy action.

We are delighted to support this effort and we look forward to collaborating with Monona Grove on this project.

Sincerely,

A handwritten signature in black ink that reads "Kathy Kuntz".

Kathy Kuntz
Director



University of Wisconsin-Stevens Point

College of Natural Resources
Wisconsin Center for Environmental Education

Stevens Point WI 54481-3897
715-346-4973; Fax: 715-346-3025
E-mail: wcee@uwsp.edu
www.uwsp.edu/cnr-ap/wcee

Energy Innovation Grant Program
Office of Energy Innovation
4822 Madison Yards Way
Madison, WI 53705

January 19, 2021

Dear EIGP Selection Committee Members,

It is our pleasure to offer support for Monona Grove High School's application for funding from the OEI for a Solar PV Project.

The Wisconsin K-12 Energy Education Program (KEEP) has a vision of communities making informed energy choices now and for a sustainable future. KEEP was founded in 1997 and has provided energy education coursework and training for over 7,000 K-12 teachers in the past 23 years. KEEP curriculum and activities have since been shared with educators from numerous U.S. states and internationally.

KEEP enthusiastically supports the proposed Monona Grove High School solar project. This project will be a significant investment in renewable energy generation for a K-12 school. Furthermore, MGHS's plans to integrate energy education into the curriculum will help educate a new generation about renewable energy and allow them the opportunity to explore Energy Career pathways.

KEEP offers curriculum and faculty professional development workshops to K-12 educators seeking to incorporate energy education in their instruction. These workshops can be delivered on-site at a K-12 school, and we would be interested to deliver workshops at MGHS once the new solar PV system has been completed. Additionally, we would be pleased to promote MGHS teachers in through our communications channels, including inviting them to present at the Educators Tent KEEP hosts annually at the MREA Renewable Energy Fair.

We are eager to partner with schools who are leading the clean energy transition in Wisconsin. I urge OEI to give its highest consideration to this **Renewable Energy Systems grant proposal**.

Sincerely,

A handwritten signature in cursive script that reads "Anna Haines".

Anna Haines, PhD
Director, WCEE



January 18, 2021

Public Service Commission of Wisconsin, Office of Energy Innovation
Hills Farms State Office Building
North Tower, 6th Floor
4822 Madison Yards Way
Madison WI 53705

Dear Energy Innovation Grant Reviewers,

The Midwest Renewable Energy Association (MREA) is pleased to commit our support to Monona Grove High School Solar PV Project.

MREA is a 501(c)(3) non-profit organization that promotes renewable energy, energy efficiency, and sustainable living through education and demonstration. Together with partners around the Midwest, we work to expand renewable energy adoption through innovative programs, renewable energy training, and educational events. The MREA operates the Solar on Schools program to promote the adoption of Solar Photovoltaic Technology by educational institutions. The MGHS Solar Project represents a significant new landmark solar installation that will help serve as a model for other schools.

If the project is funded, MREA will be interested to feature the MGHS solar installation through the production of a case study fact sheet and inclusion on the Solar On Schools website to share this example with a wider audience.

Each year for the summer solstice, MREA holds the three-day Energy Fair, the longest-running grassroots renewable energy event in the nation. The fair features hundreds of exhibitors and presenters and includes an entire track and an exhibitor tent dedicated to education. We welcome the opportunity to have MGHS faculty and students attend the fair to present on the project, and to share their educational innovations to integrate solar photovoltaic technology into the curriculum.

On behalf of MREA and the Solar on Schools program, I encourage the committee to the MGHS Solar PV Project grant proposal.

Sincerely,

Nick Hylla,
Executive Director



NSF • ATE • CREATE • Renewable Energy Center
Madison Area Technical College
1701 Wright Street, Madison, WI 53704
Tel 608.246.6521 • www.createenergy.org



Energy Innovation Grant Program

January 15, 2021

RE: Monona Grove High School Solar PV Project Grant Proposal

Dear EIGP Review Panel:

On behalf of Madison Area Technical College and the CREATE Energy Center, I am pleased to write this letter of commitment in support of the Monona Grove High School (MGHS) Solar PV Project.

I serve as a member of the Monona Grove School District (MGSD) sustainability committee, and it has been my pleasure to contribute to the development of this proposal. The 674 kW *MGHS Solar PV Project* represents a significant achievement for the Solar on Schools sector. The project will serve as an important milestone for the Wisconsin solar industry and will serve as a prominent example for other schools to replicate.

The CREATE Energy Center's mission is to advance the field of renewable energy by championing exemplary renewable energy projects and educational programs. CREATE promotes energy education, curriculum and professional development, working with a network of over 900 teachers nationwide.

In 2020 Madison College and the CREATE Energy Center earned a Green Power Leadership Award from the US EPA for the solar PV installation at the Truax campus, which is the largest rooftop solar installation in the State of Wisconsin. MGSD administrators and staff have worked with Madison College in the development of this grant proposal, and have incorporated some of the lessons learned and recommended practices from the college into the *MGHS Solar PV Project*.

The College and CREATE are committed to the *MGHS Solar Project* and will help ensure its success by:

- 1) Providing technical expertise, engineering recommendations, draft requests for proposals, and model contracts to help in the design and procurement of the MGHS solar installation.
- 2) Providing professional development to MGSD staff and faculty, including but not limited to, delivering a CREATE STEM Educator Solar Institute at Monona Grove High School.
- 3) Providing resources, tours, and presentations for MGHS faculty and students to promote renewable energy academic opportunities and renewable energy career pathways.
- 4) Disseminating the products and results of the *MGHS Solar Project* with the larger national audience of educators in the CREATE network, through our newsletter, blog, and webinar series.

The *MGHS Solar Project* will provide significant reductions in fossil fuel consumption and emission of airborne pollutants, while also providing sustainability education and outreach that is critical to the health of our environment and the nation's future. Thank you for your consideration of this worthy project.

Sincerely,

Kenneth A. Walz, Ph.D.
Madison College Science, Engineering, and Renewable Energy Instructor
Director of the Center for Renewable Energy Advanced Technological Education (CREATE)
AEE Renewable Energy Professional and NABCEP PV Associate



Grants #1600934

I am Olivia Stauffacher, a student at Monona Grove High School, and I am submitting this letter of support to document all the ways in which my and others' education and living will be improved by the MGHS solar PV project. I have taken biotechnology and environmental science courses in my high school career and I always felt there should be a first-hand scenario we could study and learn from. These solar panels could provide that learning experience for all the students at Monona Grove and even serve as a model for other districts to adopt. We could actively see the change renewable energy has on our school and the surrounding community. A very needed change to add. The number of materials and the amount of energy wasted every year is major. This energy could be saved and gain money for other areas in school. Not only are solar panels an excellent learning opportunity, a money and energy saver, but they also are a step into the future. I believe we need to adapt to the new world we live in and can be the path-pavers for other schools and communities. I am very excited to see the changes my school can implement, starting with solar panels.



Office of the County Board
Dane County Board of Supervisors
Room 106B City-County Building
210 Martin Luther King Jr. Blvd.
Madison, WI 53703-3342

Supervisor Melissa Ratcliff
608.239.6548 / FAX 608.266.4361
TTY 711 (WI-Relay)

January 19, 2021

RE: Monona Grove High School Solar Project

To the Energy Innovation Grant Review Panel:

I am the Dane County Board Supervisor of District 36 which includes Cottage Grove and more than half of the Monona Grove School District. I am expressing my enthusiastic support of the Monona Grove High School rooftop solar project. I am a mother of an 11th grader at the high school currently and I have a 7th grader that will be going there in a couple of years. In addition, I am also on the Village Board of Cottage Grove and agree with the Village Board's support of this project.

This project exemplifies projects that are in line with Dane County's 2020 Climate Action Plan. I believe it will be a model to help other communities, school districts, companies and residents to understand the importance of us all doing our part to help our environment to make it sustainable for future generations. This project shows that investing in solar saves energy and money in the long term. I am excited for the educational opportunities afforded by this project, not only with students, but also with our residents and local municipalities.

As a County Board Supervisor, Village of Cottage Grove Trustee, and parent, I will continue to advocate for and support projects and ideas that will advance a commitment to making our communities environmentally healthy for future generations and am proud of my school district for being a leader in recognizing this opportunity and responsibility to our environment.

Thank you,

Melissa Ratcliff

County Board Supervisor District 36
Village and Town of Cottage Grove and Town of Pleasant Springs
Chair of Public Works & Transportation Standing Committee
ph: 608-239-6548
ratcliff.melissa@countyofdane.com
she/hers

January 21, 2021

Energy Innovation Grant Review Board:

It is my pleasure to support of Monona Grove High School's sustainability initiative, and in particular their current Energy Innovation grant application.

I am an Edgewood College Professor Emeritus with over 40 years of teaching experience in biology, ecology, interdisciplinary environmental studies, and sustainability leadership. I founded and directed Edgewood College's graduate program in Sustainability Leadership until my retirement in 2016, and have continued to be engaged in that program and in related community projects.

The vision of the Sustainability Leadership Graduate Program is:

“...to serve as a collaborative innovation center for those who recognize the urgent call to create abundant, healthy, and prosperous communities. We provide participants with the skills and resources they need to address real-world issues related to their personal and professional goals as they become change agents for sustainability at the local and global levels. We seek to create a community of individuals with diverse interests and backgrounds and a shared passion for creating positive change.”

From the beginning of this program in 2010, we recognized the value of partnership with K-12 education, and a number of teachers and administrators (mostly from the Madison Metropolitan School District) have participated in or collaborated with our program. It is my firm belief that the vision and practice of Edgewood College's graduate program can be, and should be, adapted for students of all ages, and I am happy to support any efforts to move in this direction at Monona Grove High School.

I have been in communication about this with Teresa Radermacher, and we recently met with Monona Grove High School Environmental Sciences faculty (Tyler Kuehl) and a member of the District's Sustainability Committee and School Board (Peter Sobol). I am looking forward to continuing to meet with them and other relevant parties to explore what aspects of Edgewood's SLP program might make sense to adapt to Monona Grove. I am more than happy to consult on resource materials, and provide assistance in developing partnerships and projects within the school and the larger community.

Sincerely,

Jim Lorman, PhD
Professor Emeritus
Edgewood College
lorman@edgewood.edu