



# Renewable Energy Study Update

April 2020

League of Women Voters of Edina

<b>Introduction</b>	2
<b>About This Update</b>	2
<b>Minnesota Energy Landscape</b>	3
<b>Renewables Energy Sources</b>	3
Solar Energy	3
Community-Based Solar Gardens	4
Wind Energy	4
<b>Economics of Energy</b>	5
Pricing	5
<b>Renewable Energy Programs</b>	6
National	6
State of Minnesota	6
<b>City of Edina</b>	7
City Operations	7
Businesses	8
2016 Electricity Action Plan	8
Building Benchmarking Ordinance	9
Participation in Climate Mayors	9
Energy and Environment Commission (EEC)	10
Sustainability Manager	10
2018 Comprehensive Plan	10
<b>Edina Public Schools (EPS)</b>	10
<b>Conclusion</b>	11
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## Introduction

In 2005, the League of Women Voters of Edina (LWVE) published “A Study of Renewable Energy”<sup>1</sup>. The study explored opportunities for using renewable energy within Edina to power city buildings, schools, park facilities, businesses and homes. The study was the foundation for the LWVE Position Statement on Renewable Energy<sup>2</sup>, and for taking action with the Edina City Council.

Much has changed since 2005. Fifteen years ago Renewable Energy (RE) was a possibility, but today it is a reality. Nationally, the percentage of electricity from renewable sources has grown from a mere 2% of total electricity production, to 19% in 2019 and it is expected to surpass that generated from natural gas.<sup>3</sup> In 2019, Minnesota Governor Tim Walz announced a program to make electrical production 100% carbon free by 2050.<sup>4</sup> The city of Edina has adopted many of the LWVE recommendations, including the formation of an Energy and Environment Commission (EEC) and adding renewable energy sources to the power mix.

The 2005 study was motivated in part by energy security and independence concerns. While the US has transformed itself from an energy importer to an oil and natural gas exporter, the adverse effects of climate change are now an urgent problem. Despite the increased adoption of RE and carbon-reducing initiatives at the National, State and in Edina, carbon emissions in the atmosphere are still rising. This update is a checkpoint of the progress made to date with a focus on the City of Edina. It hopes to provide LWVE members with the tools to continue its effort in promoting RE as a key contributor in mitigating the effects of climate change.

## About This Update

At the 2019 LWVE Annual Meeting, members voted to update the study to aid the revision of the Renewable Energy Position. The RE position statements became partly obsolete because the City of Edina has implemented some of the recommendations LWVE advocated for in 2005. The goal of the revision is to make the position relevant to the present and future, while remaining true to the initial goal of promoting RE and advocating for city-wide implementation.

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<sup>1</sup> <https://lwvedina.org/wp-content/uploads/LWV-Edina-Renewable-Energy-April-2005.pdf>

<sup>2</sup> <https://lwvedina.org/renewable-energy/>

<sup>3</sup> <https://www.greentechmedia.com/articles/read/eia-renewables-will-overtake-natural-gas-in-us-power-mix>

<sup>4</sup> <https://www.mprnews.org/story/2019/03/04/walz-carbon-free-electricity-2050>

## Minnesota Energy Landscape

In 2018, Minnesota ranked eighth in the nation in electricity generating capacity and seventh in the nation in total generation from wind energy. The state's wind farms generated 11.3 million megawatthours of electricity that year, or 18% of the state's total net generation.

Coal is no longer the largest source of energy for power generation. Utility-scale electricity generation from coal was 75% in 2005 (1), 53% in 2011 and again dropped to 37% in 2018, in part because coal use decreased but also because total generation from all sources increased due to more demand. In actual metric tons burned, i.e. coal production only decreased by about 15% short tons since 1990.<sup>5,6</sup>

Minnesota's two nuclear power plants, Monticello and Prairie Island, accounted for 23% of the state's net electricity generation in 2018.<sup>(5)</sup>

## Renewables Energy Sources

The 2005 study reviewed several sources of renewable energy. In this update, we focus on two: solar and wind, because they are the most relevant for the City of Edina.

### Solar Energy

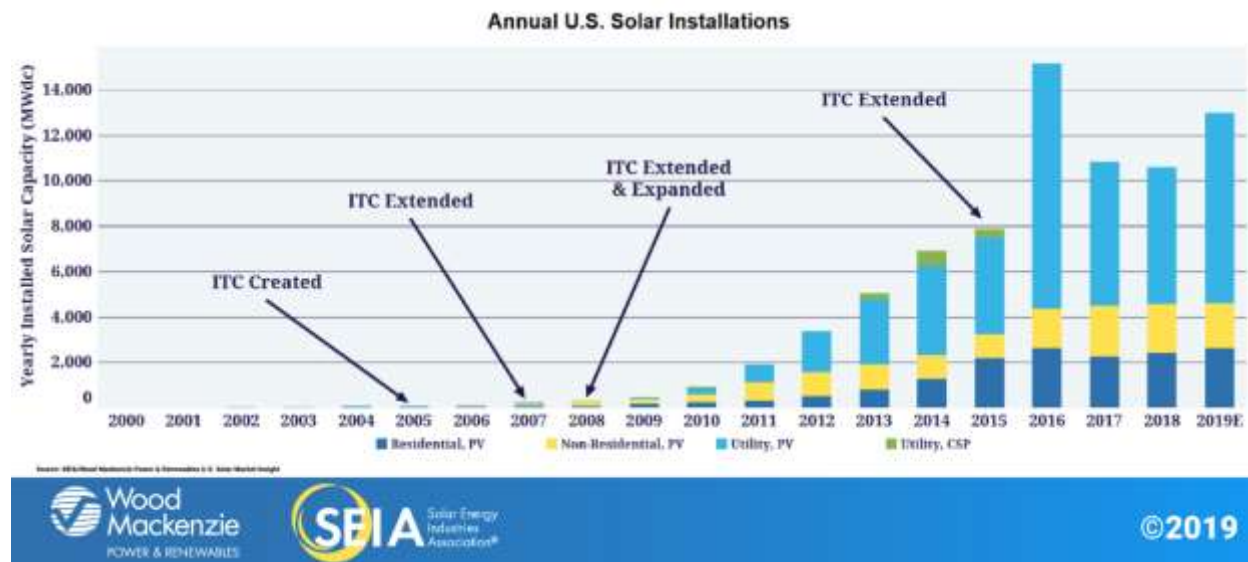
The solar energy industry was in its infancy in 2005, but it is booming in 2019, with 71.3 GW of installed capacity, enough to power 13.5 million homes across the US. The state's total solar capacity is now about 882 megawatts — enough to power over 100,000 homes — according to the new data. The major contributors to its success have been the 70% fall in the price of solar panels and the availability of Solar Investment Tax Credits (ITC). The Solar Energy Industry association (SEIA) predicts that total installed solar capacity will more than double over the next 5 years, and reach 100 GW by 2021.<sup>7</sup>

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<sup>5</sup> <https://www.eia.gov/state/?sid=MN>

<sup>6</sup> <https://www.eia.gov/state/seds/seds-data-complete.php?sid=MN>

<sup>7</sup> <https://www.seia.org/solar-industry-research-data>



Minnesota total solar capacity was about 882 megawatts in 2018— enough to power over 100,000 homes — according to the Department of Commerce.<sup>8</sup> Most of the growth is due to installations of community-based solar gardens.

### Community-Based Solar Gardens

Residential installation of solar panels can be costly and cumbersome. Community solar gardens allow homeowners to purchase solar energy without the burden of home installation.

A community solar project (aka a solar garden)—is a small solar power plant whose electricity is shared by members. Project participants benefit from the electricity generated by the community solar farm, which costs less than the price they would ordinarily pay to their utility.

Minnesota’s community solar program, launched in December 2014, hit a record 656 megawatts of operational capacity in January 2020.<sup>9</sup> Customers are seeing lower rates, for a total of more than \$2.2 million in February 2020, for 17.3 million kilowatt-hours consumed.

## Wind Energy

Since 2005, wind capacity has grown five fold, from 711 MW to 3500 MW in 2016.

Large wind farms include the Buffalo Ridge Wind Farm (225 MW), the Fenton Wind Farm (205.5 MW), the Nobles Wind Farm (201 MW), the Odell Wind Farm (200 MW) and the Bent Tree Wind Farm (201 MW).<sup>10</sup>

<sup>8</sup> <https://www.mprnews.org/story/2019/02/26/minnesotas-solar-capacity-jumped-almost-50-percent-last-year>

<sup>9</sup> <https://ilsr.org/minnesotas-community-solar-program/>

<sup>10</sup> [https://en.wikipedia.org/wiki/Wind\\_power\\_in\\_Minnesota](https://en.wikipedia.org/wiki/Wind_power_in_Minnesota)

Xcel customers in Edina can subscribe to Windsource, a program where customers choose how much of their electricity usage is billed at the wind energy rate. Windsource adds, on average, \$0.01/kWh to the energy cost compared to natural gas or coal. For a typical home using 900 kWh a month, it would add \$9/month to be 100% Windsorce-powered.

## Economics of Energy

### Pricing

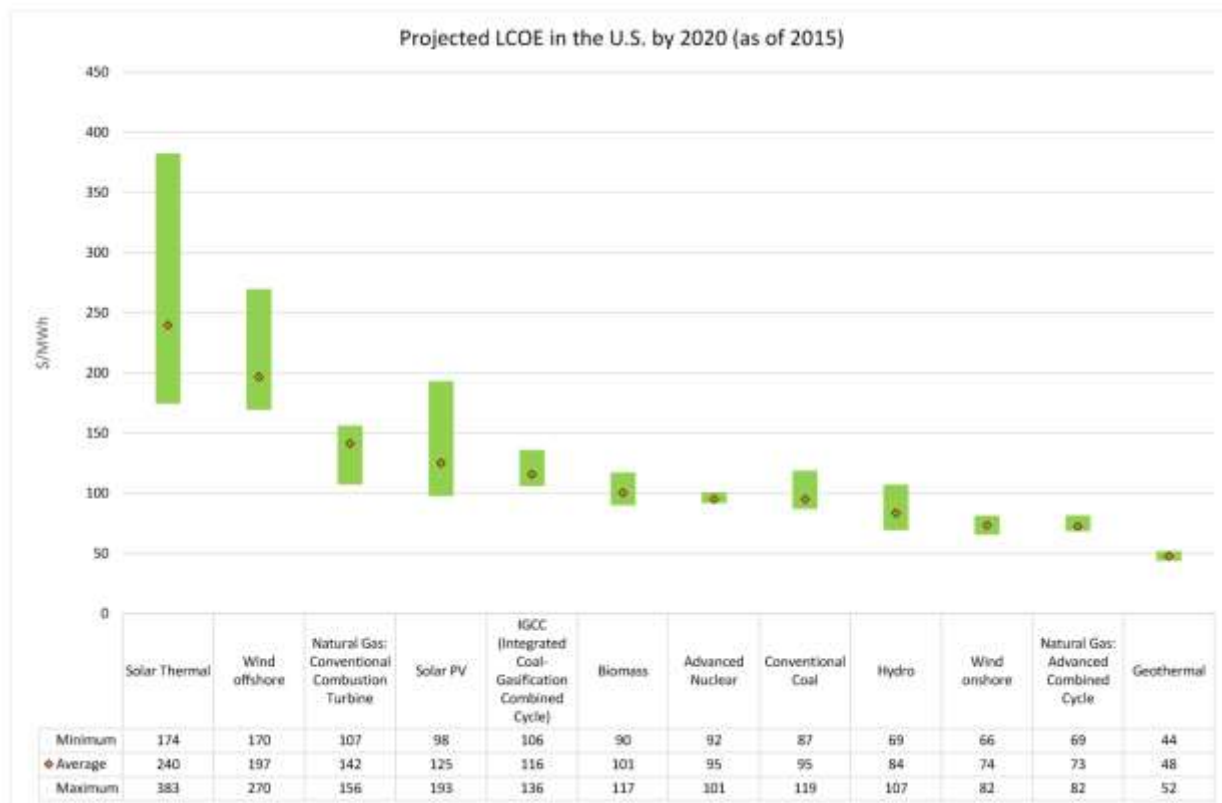
Different energy production sources can be compared with each other using the Levelized Cost of Electricity, or LCOE.<sup>11</sup> The LCOE of an energy-generating asset can be thought of as the average total cost of building and operating the asset, per unit of total electricity generated over an assumed lifetime.

Solar photovoltaic (PV) and wind costs have dropped 88% and 69% since 2009, respectively. Meanwhile, coal and nuclear costs have decreased by 9% and increased by 23%, respectively. As can be seen in the chart below, onshore wind energy is now at price parity with natural gas, while Solar PV generated electricity is cheaper than that generated by conventional natural gas turbines.<sup>12</sup>

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<sup>11</sup> [https://en.wikipedia.org/wiki/Levelized\\_cost\\_of\\_energy](https://en.wikipedia.org/wiki/Levelized_cost_of_energy)

<sup>12</sup> [https://www.eia.gov/forecasts/aeo/electricity\\_generation.cfm](https://www.eia.gov/forecasts/aeo/electricity_generation.cfm)



[https://www.eia.gov/forecasts/aeo/electricity\\_generation.cfm](https://www.eia.gov/forecasts/aeo/electricity_generation.cfm)

## Renewable Energy Programs

### National

A compilation of US programs and incentives is found at the Energy Information Administration website: <https://www.eia.gov/energyexplained/renewable-sources/incentives.php>

### State of Minnesota

Minnesota reached its renewable electricity standard goal of 25% by 2025 using wind, solar, biomass, and hydropower in 2018, well ahead of the target date. Minnesota is also on course to reach its current solar electricity standard of 1.5% by the end of 2020.<sup>13</sup>

In March 2019, Governor Tim Walz announced a plan for all carbon-free electricity by 2050.<sup>14</sup> Walz's plan would require utilities to prioritize efficient, clean energy sources over fossil fuels for new power generation. The proposal would raise efficiency standards for investor-owned electric utilities, such as Xcel energy, and include help for low-income households to make their

<sup>13</sup> <https://www.scientificamerican.com/article/minnesota-is-on-track-to-meet-its-renewable-energy-goals/>.

<sup>14</sup> (<https://www.mprnews.org/story/2019/03/04/walz-carbon-free-electricity-2050>)

homes more energy-efficient. Xcel Energy has already pledged to make its electricity carbon-free by 2050 and it will include nuclear power to reach this goal.<sup>15</sup>

The Minnesota Commerce Department offers residents and businesses incentives to offset the cost of solar installation. The Solar\*Rewards Program provides residential and commercial customers with 10 years of annual incentive payments based on the solar energy system's annual production. Solar\*Rewards are available to Xcel customers on a first-come, first-served basis, with \$10 million available in 2020 and \$5 million in 2021.

Minnesota offers additional tax incentives. In addition, personal property consisting of solar electric energy systems is exempt from property taxation. The list of all available incentives is found at [www.dsireusa.org](http://www.dsireusa.org)

## City of Edina

Tara Brown, Sustainability Manager for the City of Edina, provided information on the state of RE in the City through email exchanges.

### City Operations

Solar panels were installed on the roof of Edina City Hall in 2012. The system is estimated to generate savings of \$1,300 a year. The City completed maintenance to maximize production in 2019.

A solar array of 2,000 panels was installed in 2018 on the roof of the Public Work Facility. The City leases the rooftop space to Cooperative Energy Futures, which runs and maintains the solar garden. As of today, 66 residents have subscribed and the array is meeting the production capacity of 664 kW. Subscribers enroll in a pay-as-you go subscription, avoiding costly upfront payments. Under the pay-as-you-go model, subscribers pay for their share of the array in installments, and take advantage of Renewable Energy Credits (REC) over the course of the 25-year subscription. By the end of the term, subscribers would save a cumulative 23-24 percent off their energy bill.

At present the City does not plan further solar installations. However, 40-50% of the City electricity is subscribed to solar gardens on 25 year contracts.

Edina is SolSmart Gold certified. SolSmart is led by the International City/County Management Association and The Solar Foundation and it is funded by the U.S. Department of Energy Solar Energy Technologies Office.<sup>16</sup> It recognizes cities, counties, and regional organizations for making it faster, easier, and more affordable to go solar. The organization provides no-cost

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<sup>15</sup>

[https://www.xcelenergy.com/company/corporate\\_responsibility\\_report/library\\_of\\_report\\_briefs/a\\_carbon\\_free\\_future](https://www.xcelenergy.com/company/corporate_responsibility_report/library_of_report_briefs/a_carbon_free_future)

<sup>16</sup> <https://www.solsmart.org>



technical assistance to help communities become "open for solar business." In recognition of their achievements, communities receive designations of SolSmart Gold, Silver, and Bronze. Edina was awarded the highest designation, Gold.

## Businesses

The Edina Emerald Energy Program (EEEP) provides business property owners with financing options for renewable energy or energy efficient building improvements through partnership with the St. Paul Port Authority (SPPA) Program called Pace of MN.<sup>17</sup> The Grandview Tire & Auto location on 70th Street used EEEP to install a 27-kilowatt solar panel system. Complete data from businesses were not available. Western National Mutual also has installed solar panels.

Note that the EEEP page on the City of Edina is no longer active. The latest financing activities appear to be from 2013.<sup>18</sup>

A Google search at the Google Project Sunroof project returned a total of 39 installations in Edina as of November 2018, which includes the City, schools, businesses and residential installations.

## 2016 Electricity Action Plan

The 2016 Electricity Action Plan sets goals for reductions of Greenhouse Gases (GHG). The first goal was to reduce GHG emissions by 7.5% (the goal was 18 months from 2016). Unfortunately the City could not reach the full goal in the 18 month period. However, the City and the Energy and Environment Commission (EEC) continue to work on these projects. For example, the City updated the liquor store cooler doors and condensers. They are seeing 15 to 45% decrease in electricity use since the replacement.<sup>19</sup> Now two of the three liquor stores are Energy Star certified for 2019 which means they are in the top 25% energy efficiency of similar types/uses of the building.

The goal of having 750 homes/year adopting energy savings plans in their homes was achieved. Home Energy Squad (HES) visits hit a new high in 2019. Thanks in part to a condo association signing up for audits. The goal of having businesses reduce electricity usage by 2%/year was achieved mainly through lighting retrofits and new buildings taking on energy efficiency improvements beyond code.

During the last quarter of 2006, the City sent a survey to 200 businesses to find out more about their energy use practices. Unfortunately, the response rate was less than 1%. Given the low response, neither the EEC nor staff have done another survey. Instead, they created relationships and messages that would resonate with targeted audiences. Activities included

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<sup>17</sup> <https://www.minnpace.com>

<sup>18</sup> <https://edinamag.com/article/alan-ackerberg-parasole/going-green-edina-emerald-efficiency-program>

<sup>19</sup> [https://www.hometownsource.com/sun\\_current/free/edina-liquor-stores-earn-energy-star-certification/article\\_93ff3c3e-4773-11ea-a2f0-8b8b91e321f9.html](https://www.hometownsource.com/sun_current/free/edina-liquor-stores-earn-energy-star-certification/article_93ff3c3e-4773-11ea-a2f0-8b8b91e321f9.html)

outreach to the 50th and France Business and Professional Association and the Edina Chamber of Commerce, Rotary meetings, engagement of tenants at Centennials Lakes on energy efficiency, speaking to condo associations when replacing roofs, and starting the Green Business Recognition program.

## Building Benchmarking Ordinance

The Edina City Council approved an efficient building benchmarking ordinance on June 4th, 2019.<sup>20</sup> Commercial buildings account for 60% of energy usage in Edina. This ordinance is one way Edina is working to improve energy efficiencies throughout the city.

Owners of existing commercial and multi-family buildings over 25,000 square feet will have to benchmark their buildings' energy usage with the online Energy Star Portfolio Manager provided by the Environmental Protection Agency (EPA).<sup>21</sup> Edina is the 31st city in the nation and the second in Minnesota, after Minneapolis, to require benchmarking through this program. The city will collect data and provide guidance to building owners on what they can do to decrease energy consumption.

Hennepin County has identified a consultant that will help manage and successfully administer the benchmarking program. The program is estimated to save 1%-2% annually. In addition, CenterPoint Energy and Xcel Energy have recently made updates to their system which will now allow building owners to automatically send energy use information to Energy Star Portfolio Manager. Energy Star Portfolio Manager then compares the energy use of the building to similar buildings and gives it a benchmarking score, similar to the Energy Star labels consumers see when shopping for appliances.

Building owners will receive training and onboarding support to this program through the consultant and will have access to a helpline and an online help portal. More information about the program will be mailed to businesses in early 2020.

## Participation in Climate Mayors

In 2019, Edina Mayor Jim Hovland was nominated to the Climate Mayors Steering Committee.<sup>22</sup> The Climate Mayors coalition is a non-partisan group of 438 mayors to date that have pledged to uphold the goals of the Paris Agreement in their cities and reduce harmful greenhouse gas emissions. The steering committee has 24 members and St. Paul Mayor Melvin Carter was also named to the committee. Participants collectively come together to share at the Federal level what cities are doing and what they need.

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<sup>20</sup> [https://www.hometownsource.com/sun\\_current/free/city-of-edina-establishes-energy-benchmarking-ordinance/article\\_9d14aa00-8d1c-11e9-b8e7-f71bc0f5894b.html](https://www.hometownsource.com/sun_current/free/city-of-edina-establishes-energy-benchmarking-ordinance/article_9d14aa00-8d1c-11e9-b8e7-f71bc0f5894b.html)

<sup>21</sup> <https://www.energystar.gov/buildings/facility-owners-and-managers/existing-buildings/use-portfolio-manager>

<sup>22</sup> <http://www.startribune.com/st-paul-mayor-melvin-carter-and-edina-mayor-jim-hovland-named-to-national-climate-mayors-committee/565933322/>

As a Climate Mayors member city, Edina has prioritized climate actions by implementing an Energy Action Plan, creating Green Fleet recommendations, and implementing an energy benchmarking ordinance.

## Energy and Environment Commission (EEC)

The Edina Energy and Environment Commission was established in 2006, following advocacy action by LWVE upon completion of the 2005 Study. The Commission advises the City Council on energy conservation, waste reduction and environmental and conservation efforts. The City publishes the work of the commission on its website, as well its bylaws and member composition at <https://www.edinamn.gov/1545/Energy-Environment-Commission>.

## Sustainability Manager

In 2015 , Edina created the position of Sustainability Manager to support the work of the EEC and the City. Tara Brown has been in this role since 2015.

## 2018 Comprehensive Plan

Chapter 8 of the 2018 Comprehensive plan is dedicated to Energy and the Environment. The current draft states:<sup>23</sup>

“The City of Edina will take actions to address climate change, including greenhouse gas reduction and solid waste reduction.”

## Edina Public Schools (EPS)

We contacted Eric Hamilton, Director of Building & Grounds by email. He reported that the schools are pursuing energy efficiency and building comfort. Regarding renewables, EPS is not pursuing wind power, but they are focusing on solar installations. Three systems are planned as of December 2019, described in the table below.

Location	System Size (kW DC)	kWh 1st year estimate
EPS - Cornelia	406	488,000
EPS - Transportation	30	36,050
EPS - High School	3	34 *

★ EPS is waiting on structural review results.

The installer is Mouli Engineering Inc. ([www.solarpod.com](http://www.solarpod.com))

<sup>23</sup> <https://www.edinamn.gov/647/Comprehensive-Plan>

The Sun Current article “Solar Power comes to Edina Schools”, dated November 6, 2019, described these systems in detail.<sup>24</sup>

The system on the roof of the transportation facility is already in use. The system atop Cornelia Elementary's new roof is scheduled to be installed in summer 2020 and it is projected to save \$45,500 over 10 years.

The installations were made possible through a collaboration with Clean Energy Resource, a local non-profit working with the Minnesota’s Office of Enterprise Sustainability.<sup>25</sup> Their initiative, “Solar Possible”, facilitated the request-for-proposal process within the Xcel Energy service area.<sup>26</sup> Proposals from three prequalified vendors were evaluated based on electricity rate schedule, system size, expected first-year production, starting rate, rate escalation and product guarantee. Mouli Engineering, a Minnesota company, was approved to install solar arrays by SolarPod.

The solar installation at EPS High School will be an eight-panel solar array specifically geared toward academic use to be incorporated into the curriculum of STEM classes and the Environmental science class. The student-led Project Earth club raised funds for the purchase of the array, which will be oriented for data collection, comparison, and other studies. The electricity generated by the array will feed into the Project Lead The Way lab at the high school.

## Conclusion

Use of RE in the City has progressed thanks to a combination of favorable factors: reduction in the price of installation, subsidies through various financing mechanisms, and the will of the state of MN and Edina City Council to reduce GHG emissions.

The City of Edina has implemented many of the recommendations made by LWVE in 2006 and it is continuing to increase RE adoption. Despite progress, the effects of Climate Change are now self evident. One example is damage from increasing rainfall and groundwater issues because of increased rainfall. It is clear that RE implementation needs to be supplemented by other programs on energy conservation and protection of the environment to increase the City’s resilience. As of March of this year, the City Council is reviewing a new Flood Risk Reduction Strategy to combat flooding.<sup>27</sup>

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<sup>24</sup> [https://www.hometownsource.com/sun\\_current/free/solar-power-comes-to-edina-schools/article\\_a7174cd2-00b3-11ea-b369-a7ce67544116.htm](https://www.hometownsource.com/sun_current/free/solar-power-comes-to-edina-schools/article_a7174cd2-00b3-11ea-b369-a7ce67544116.htm)

<sup>25</sup> <https://mn.gov/admin/government/sustainability/>

<sup>26</sup> <https://www.cleanenergyresourceteams.org/solar-possible-new-joint-purchasing-effort-agencies-local-governments-schools>

<sup>27</sup> [https://www.hometownsource.com/sun\\_current/community/edina-strategy-aims-to-combat-flooding-increasing-rainfall/article\\_be095392-69f7-11ea-8361-c783fbf44fa3.html](https://www.hometownsource.com/sun_current/community/edina-strategy-aims-to-combat-flooding-increasing-rainfall/article_be095392-69f7-11ea-8361-c783fbf44fa3.html)

For the past eight years, Edina has been undergoing a boom in multi-unit residential buildings following the 2008 recession. Studies have shown that households living in apartments use about half of the energy than those living in single family homes.<sup>28</sup> The new Building Benchmark Ordinance could be helpful in monitoring actual energy savings. Currently, none of the new constructions have included solar panels and building owners have not advertised offsetting their energy use through RE programs. The economics of introducing RE in apartment buildings should be studied, taking in consideration added costs and rent affordability.

All-in-all, Edina has made significant progress in RE since 2005. However, there is more to be done. LWVE should continue to support a RE coalition; should continue to advocate for RE technology for the City and EPS buildings; and to advocate for the establishment of a goal of a percentage of City energy to come from RE sources over the next 5-10 years.

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<sup>28</sup> <https://www.eia.gov/todayinenergy/detail.php?id=11731>