



VILLAGE OF DEERFIELD

Greenhouse Gas Reduction Working Group Climate Action Report

Local Actions and Policies to Reduce
Deerfield's Greenhouse Gas Emissions and
Adapt to Climate Change

Produced by

Greenhouse Gas Reduction Working
Group

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*Through partnership with ICLEI – Local
Government for Sustainability (ICLEI)*

Credits and Acknowledgments

All members of the Working Group were appointed by Mayor Daniel C. Shapiro with advice and consent of the Board of Trustees. The Working Group was intended to represent a diverse set of stakeholders and included:

Board of Trustees

- Mary Oppenheim, Chairperson
- Elaine Jacoby

Sustainability Commission

- Donald Anderson
- William Mertes

Go Green Deerfield

- Art Wilde
- Camilla Dadey

Business Community Representative

- Victoria Street, Executive Director of the DBR Chamber of Commerce

Staff Support

- Clint Case, Building and Code Enforcement Supervisor
- Andrew Lichterman, Assistant Village Manager / Dir. of Comm. Development
- Dan Nakahara, Planner
- Robert Phillips, Director of Public Works and Engineering

This Climate Action Plan was developed using a template provided by ICLEI – Local Governments for Sustainability, USA.

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EXECUTIVE SUMMARY

Introduction

In recognition that local governments and municipalities play a lead role in the global effort to fight climate change, the Village of Deerfield Board of Trustees adopted a Proclamation on February 18, 2020, supporting the allocation of resources to achieve greenhouse gas (“GHG”) reduction goals and urged all community stakeholders to join in this effort. Specifically, the Village Board supported the measurable goals of reducing greenhouse gas emissions, in all segments of the community, by 45% by 2030 and becoming 100% carbon neutral by 2050.

In furtherance of the Proclamation, the Village Board established a GHG Reduction Ad Hoc Working Group (“Working Group”) to complete the initial planning work that could lead to later implementation actions. The planning phase included (i) identifying goals by focus area, (ii) recommending high-level programs and policies that could be implemented in the short-term and long-term; and, (iii) describing the structure and resources needed for implementation.

This Climate Action Report (“Report”) is the output of the Working Group and is intended to serve as a guiding document that can inform implementation efforts and future climate/adaption/resiliency plans for longer-term implementation. The document will describe the purpose, scope and process utilized in the creation of this Report. The Report identifies the Village’s baseline GHG emissions inventory and sets a GHG reduction target. Four focus areas are used to organize the mitigation efforts. Along with the discussion of each focus area is an identification of the general resources that are needed to accompany the various strategies. High-level strategies and

noteworthy tactics are summarized in each of the specific focus area chapters while the more detailed tactics can be found in Appendix I. For reference purposes, a self-assessment framework utilizing resources from the Green Region Compact 2 is enclosed as Appendix II. The data set utilized by the Working Group to establish the 2017 GHG emissions baseline is enclosed as Appendix III.

Vision Statement

To continue the Village of Deerfield's rich history of leadership to inspire community action, transform local economies and positively impact peoples' lives by offering innovative and sustainable practices to achieve specific and measurable goals for reducing greenhouse gas emissions.

Purpose

By creating a clear course of action so that everyone has a role in creating and achieving climate and sustainability goals, the Report can help drive and coordinate local efforts toward a reduction in GHG emissions of 45% by 2030 compared to the 2017 baseline year.

The Report is a framework for the development and implementation of actions that reduce the Village's GHG emissions. The Report provides guiding objectives and strategies to realize the Village's GHG reduction goal. The focus was to mitigate our jurisdiction's own local GHG emissions. If every community acted in this manner the global problem of GHG emissions would be solved.

Scope

This Report addresses the major sources of emissions in the Village and sets forth objectives and strategies in three key focus areas associated with the 2030 target goal and a cross-sectional focus area associated with the longer-term 2050 goal. Many strategies will require both the Village of Deerfield and community partners to work together to achieve GHG reductions.

Focus areas include:

- Energy (2030)
- Transportation (2030)
- Waste (2030)
- Ecosystem / Food / Goods & Services (2050)

Future plans should supplement this framework to further, coordinate, measure, and adapt efforts moving forward. In addition to listing actions, the Report discusses how each action will be implemented via timelines, financing, and assignment of responsibilities to departments, community partners, or business sectors where known.

Process

The Working Group held their first meeting on October 21, 2021, and held regular meetings, typically occurring twice a month, with the last meeting being held on May 25, 2022. The Working Group conducted meetings both remotely and in-person and all meetings complied with the Open Meetings Act. All meeting minutes and agendas can be viewed at <http://il-deerfield.civicplus.com/AgendaCenter>.

The first task of the Working Group was to set a baseline year for GHG emissions and reach consensus on the assumptions that led to that baseline emissions inventory. The Working Group utilized industry best practices and protocols to establish the baseline inventory, which are discussed in more detail later in this Report.

Once the baseline inventory was established each focus area could be prioritized and evaluated. The majority of the meetings were devoted to comprehensively evaluating focus areas one-by-one. Once a consensus could be reached on objectives and strategies for a particular focus area, the Working Group began the study of the next focus area. Some focus areas, such as Energy, required more in-depth study, and the Working Group devoted several meetings to this particular topic given the significance of its GHG emissions.

Baseline GHG Findings

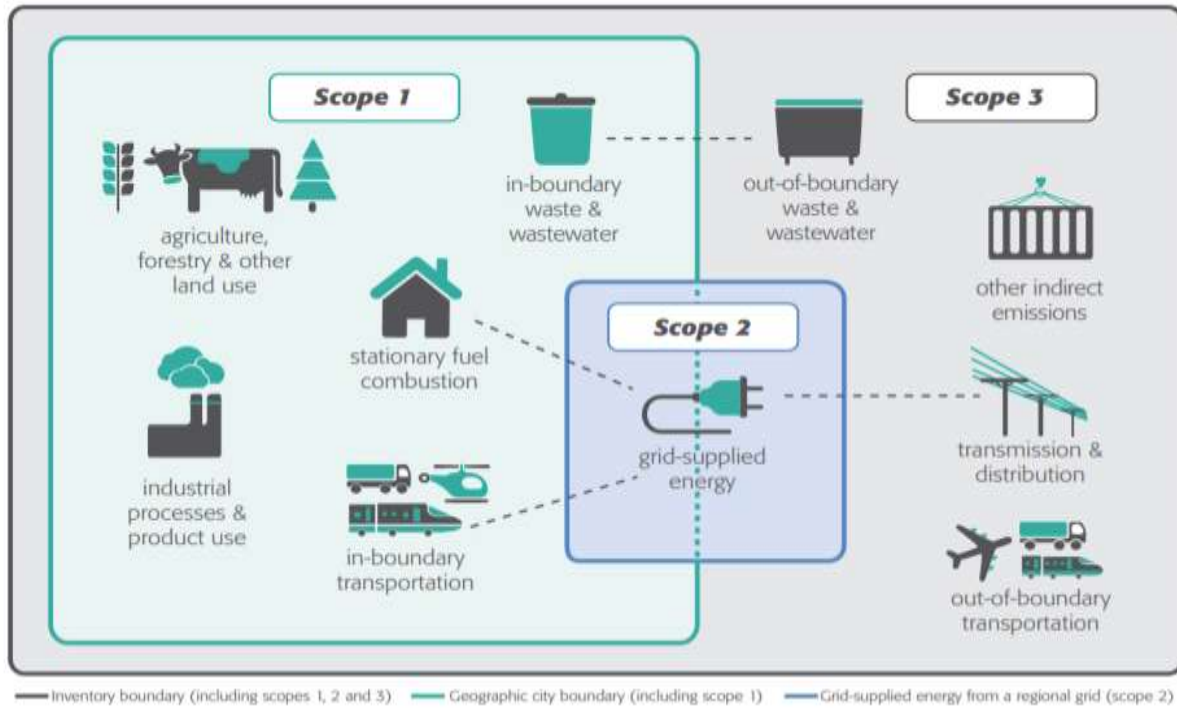
The Working Group utilized the U.S. and Global Protocol for Accounting and Reporting of Greenhouse Gas Emissions standards for computing a 2017 GHG emissions baseline to the best of their ability. These standards were created by ICLEI, an international non-governmental organization that promotes sustainable development, and have been used by municipalities since the early 1990's to help develop community-wide GHG inventories.

The Working Group set a 2017 GHG inventory boundary that covers three scopes consistent with the Global Protocol for Community-Scale Greenhouse Gas Emissions inventories developed by ICLEI. This framework helps to differentiate emissions based on where they are derived from and their direct or indirect impact on the Village's GHG emissions. Scope 1 GHG emissions are from sources located discretely within the Village's corporate limits. Scope 2 GHG emissions occur as a consequence of the use of grid-supplied electricity, heat, steam and/or cooling within the Village's boundary. Scope 3 GHG emissions occur outside the Village's boundary as a result of activities taking place within the Village.

Figure 1 illustrates which emission sources occur solely within the geographic boundary of the Village, which occur outside the Village, and which may occur across boundaries.

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Figure 1



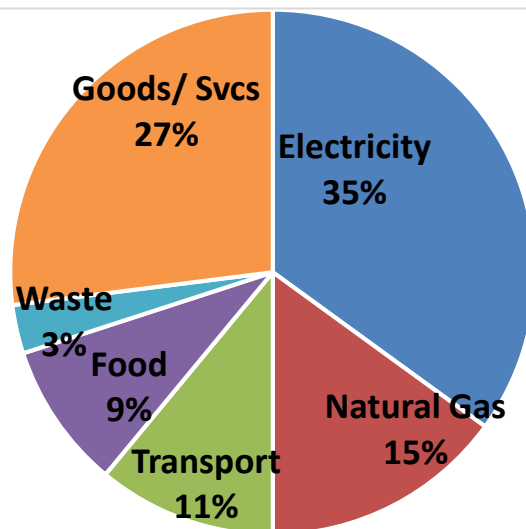
Community-wide emissions represent the sum total of emissions produced within the Village of Deerfield limits as well as emissions resulting from electricity use within the jurisdiction, even if said electricity is generated elsewhere. Government operations are a subset of the total community emissions.

The 2017 baseline community-wide GHG inventory totals 428,798 metric tons of carbon dioxide equivalent (MTCO₂).

A breakdown of the GHG inventory by scope and focus area is illustrated in Figure 2.

Figure 2

Source	MTCO2 2017	Percent
<i>Scope 1 (In Boundary)</i>		
Natural Gas	60,185	14%
Transportation	45,750	11%
<i>Scope 2 (Out of Boundary)</i>		
Electricity	150,913	35%
Municipal Energy	2,184	1%
<i>Scope 3 (Purchases: Goods & Services)</i>		
Goods/ Services*	116,000	27%
Food	42,185	10%
Waste	11,581	3%
Total	428,798	100%



Source: Per Guidelines of U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions

* Goods/ Services emissions modeled based on Cool Climate Map- Berkley

GHG Reduction Target

The GHG reduction target is to reduce emissions by 45% by 2030 compared to the 2017 baseline year. The GHG mitigation efforts associated with achieving the 2030 target goal are the major focus of this report. Additionally, the Village set a target of being 100% carbon neutral by 2050, which is the focus of longer-term programs and should be further studied and refined in subsequent reports.

To achieve the target 2030 goal the following objectives are proposed:

- **Electricity:** 36% of total MTCO₂ (including municipal)
 - **Convert 100% of electricity to renewable sources by 2030**
- **Transportation:** 11% of total MTCO₂
 - **Reduce transportation emissions by 55% by 2030**
- **Waste:** 3% of total MTCO₂
 - **Reduce waste emissions by 66% by 2030**

Implementing strategies to achieve the objectives noted above will result in a 45% reduction of GHG emissions compared to the 2017 baseline year as shown in Figure 3.

Figure 3*

Source	MTCO ₂ 2017	Percent	Mitigation Goals Impact	
			2030	2050
Scope 1 (In Boundary)				
Natural Gas	60,185	14%		14%
Transportation	45,750	11%	6%	5%
Scope 2 (Out of Boundary)				
Electricity	150,913	35%	35%	
Municipal Energy	2,184	1%	1%	
Scope 3 (Purchases: Goods & Services)				
Goods/ Services*	116,000	27%		27%
Food	42,185	10%		9%
Waste	11,581	3%	2%	1%
Total	428,798	100%	45%	56%

*Assumes little or no growth from 2017 baseline

2030 Focus Areas and Mitigation Strategies

Energy:

- Use building energy more efficiently
- Advance renewable energy
- Reduce energy consumption
- Enact policies and programs that supply clean energy
- Engage the community in clean energy practices and efficiencies

Transportation:

- Reduce dependence on gasoline powered vehicles by supporting conversion of municipal fleet, residential vehicles and lawncare equipment to electric power
- Support safe and effective bike and pedestrian transportation that promotes sustainable transportation choices
- Maintain a diverse and efficient transportation infrastructure
- Integrate sustainability into transportation policies, programs and regulations

Waste:

- Establish baseline landfill diversion goals based on waste stream audits of various user types (e.g., residential, commercial, municipal)
- Enact policies that support waste diversion goals including consideration for hazardous and non-curb-side picked up waste
- Reduce waste by supporting the systems of a circular economy that regenerate natural systems, design out waste and pollution, and keep products and materials in use
- Provide infrastructure, programs and policies that support composting and recycling materials across all sectors
- Educate and engage the community in waste reduction, diversion and recycling

ENERGY

Electricity 36% of total MTCO2

OBEJECTIVE: CONVERT 100% OF ELECTRICITY TO RENEWABLE SOURCES BY 2030

Discussion: During the Working Group’s analysis, discussion of energy consumption was bifurcated into: (1) electricity usage and (2) natural gas usage. Electricity accounts for 36% of the total community-wide carbon footprint, or 153,097 MTCO2 for the base

Figure 4

Source	MTCO2 2017	Percent
Scope 1 (In Boundary)		
Natural Gas	60,185	14%
Transportation	45,750	11%
Scope 2 (Out of Boundary)		
Electricity	150,913	35%
Municipal Energy	2,184	1%
Scope 3 (Purchases: Goods & Services)		
Goods/ Services*	116,000	27%
Food	42,185	10%
Waste	11,581	3%
Total	428,798	100%

year 2017. Of the 153,097 MTCO2 from electricity consumption, municipal and government institutions account for 1%, or 2,184 MTCO2 of the total. Natural gas accounts for 14% of the total community-wide carbon footprint, or 60,185 MTCO2 for the base year 2017 (see Figure 4). Due to the substantial impact electricity consumption has on the overall carbon footprint, the Working Group primarily focused their discussion around strategies and tactics that would achieve the **objective of converting 100% of electricity to renewable sources by 2030.**

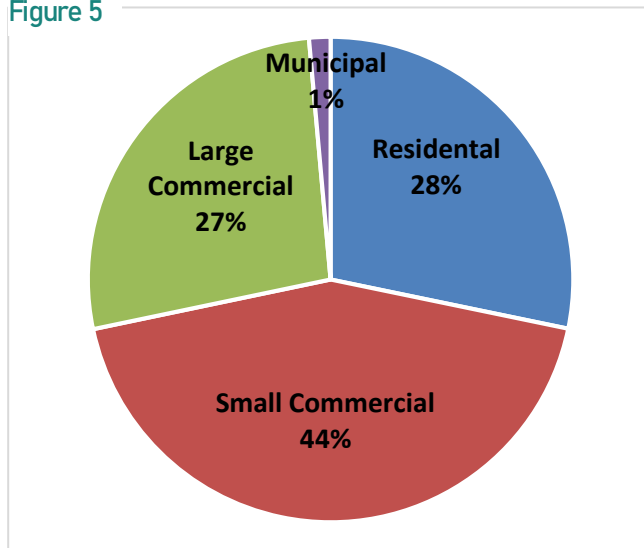
High-Level Strategies

- Use building energy more efficiently
- Advance renewable energy

- Reduce energy consumption
- Enact policies and programs that supply clean energy
- Engage the community in clean energy practices and efficiencies

Electricity Usage

Figure 5



28% of electricity consumption is from residential customers, 44% is from small commercial customers, 27% is from large commercial customers and 1% is from municipal or other government institutions (see Figure 5).

The Village is approximately 81% single-family (detached), 19% multi-family (attached) and composed of 7,323 households (2020 Census).

Source: 2017 ComEd Usage Data

It is estimated that the Village has approximately 300 commercial businesses in operation, the vast majority of those being small businesses that are either sole proprietor or retail chain. Large commercial is defined as customers with 100kW peak usage. Municipal electricity usage includes Village operations, school districts, park district, township, fire protection district as well as street and highway lighting.

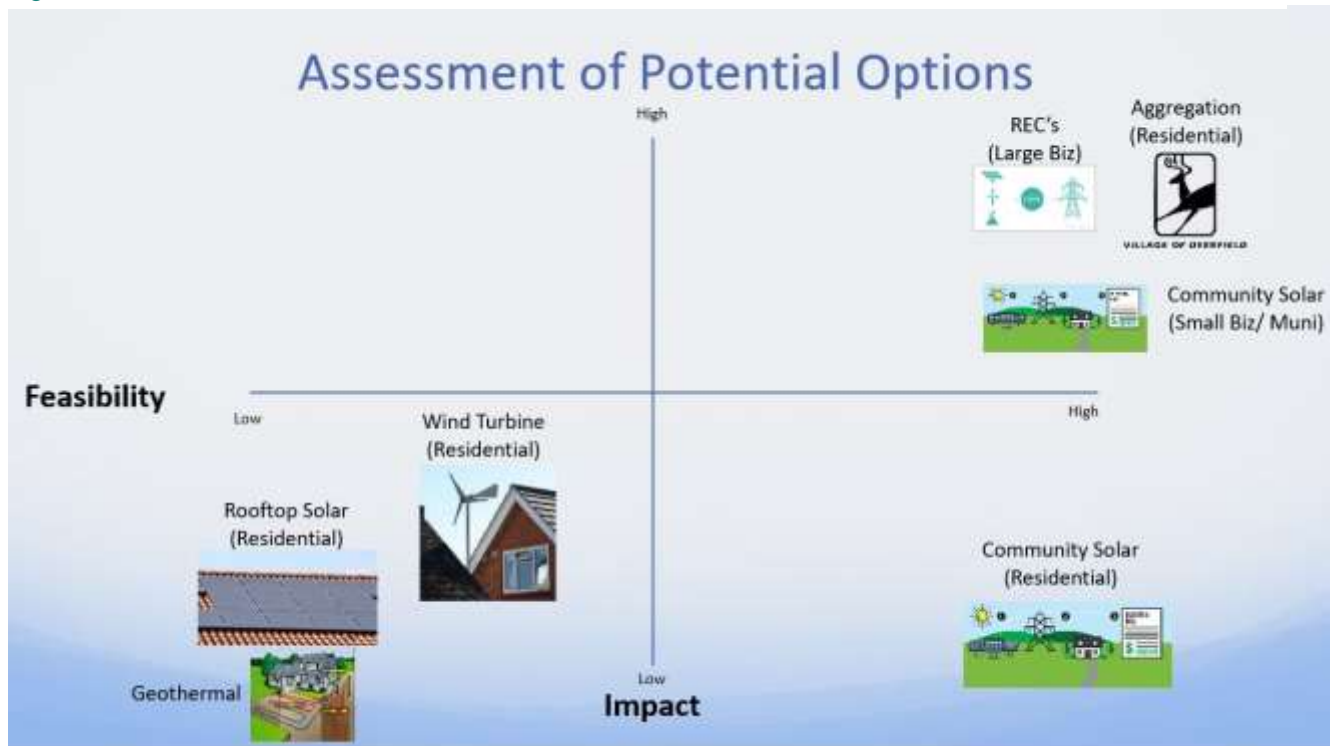
Methodology – Renewable Energy Programs

When trying to determine the cost/benefit associated with each specific tactic the Working Group utilized a prioritization tool to assess the feasibility and GHG mitigation impact for each program or policy suggestion (see Figure 6). This methodology was specifically applied to programs and tactics for achieving 100% renewable energy.

Renewable energy program options include:

- Municipal Aggregation
- Community Solar
- Renewable Energy Credits (RECs)
- Rooftop Solar
- Wind Turbine
- Geothermal

Figure 6



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Assessment:

Programs such as **Community Solar** are **highly feasible** and well underway, and while they are worthwhile and need to continue to be pursued, they are assessed as relatively **low impact** because they require households to “opt-in” and there is limited availability. As such, only around 200 households are actively participating in the program today and this solution does not offer the urgency to reach our 2030 goal, especially when accounting for the participation needed from the business community. In contrast, programs and policies that promote **Renewable Energy Credits** are assessed as being both **highly impactful** at mitigating GHG emissions and **highly feasible**. A Renewable Energy Credit (“REC”) can be purchased for every megawatt-hour (“MWh”) of electricity generated and delivered to the electric grid from a renewable energy resource such as wind or solar.

Notable Tactic - Renewable Energy Credits

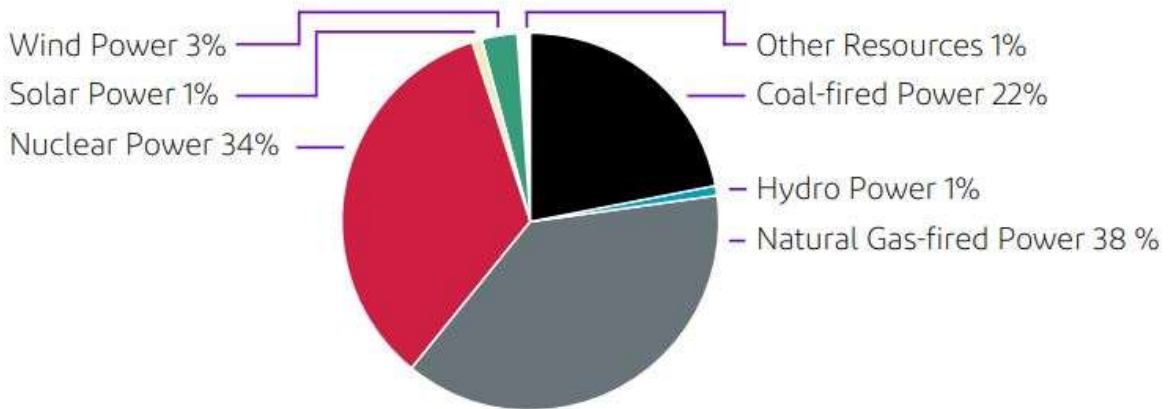
As noted above, RECs were determined to be a highly impactful and highly feasible solution to mitigating GHG emissions in the short-term. This specific program was evaluated by the Working Group at several meetings. An analysis showed that it would cost approximately \$435,000 annually to purchase 144,821 MWh of renewable energy sourcing from RECs. 144,821 MWh reflects the net community-wide electricity consumption to be offset by RECs after accounting for the ComEd supply that comes from carbon-based resources and ComEd’s own REC procurement (*see Appendix III for calculations*). In other words, this approach recognizes that approximately 40% of the electricity sourced by ComEd already comes from non-carbon sources such as nuclear power (34%), wind power (3%) and solar power/other (2%) and therefore these sources do not require the purchase of RECS to offset GHG emissions (*see Figure 7*).

Through the Village’s Community Choice Aggregation Program, the Village already receives approximately \$60,000 in a civic contribution to purchase RECs resulting in an annual net balance of approximately \$375,000 to achieve 100% renewable energy through this program. However, it should be noted that these dollar assumptions reflect

the current REC market, which is about \$3.00 per credit. Historically, the REC market has been volatile and there is uncertainty around future REC pricing.

Figure 7

Sources of Electricity for the 12 months ending December 31, 2021



Source: 2021 ComEd Environmental Disclosure Report

Electric Utility Tax Proposal:

The Working Group determined that the most logical nexus to generate revenue to support a REC purchase would be from the Electricity Utility Tax. The Village adopted a Municipal Electric Utility Tax in 2010 imposing a tax on all persons engaged in the business of distributing, supplying, furnishing or selling electricity for use of consumption within the corporate limits. The Working Group analyzed the tax based on user type and used a weighted average to offer a revised tax schedule that would generate enough revenue to make the REC purchase and increase the portion of the tax in direct proportion to the customers' energy consumption. In other words, since residential customers account for 28% of the energy consumption, the electric utility tax would be increased in a manner whereby residential customers would receive a proportional 28% tax increase. This same methodology was applied to all user types resulting in the tax proposal shown in Figure 8. The dollar impact on a sample user type is shown in Figure 9.

Figure 8

Bracket	Current Tax Rate	Proposed Tax Rate
For the First 2,000 kWh	0.0061	0.0075
For the Next 48,000 kWh	0.004	0.0062
For the Next 50,000 kWh	0.0036	0.0039
For the Next 400,000 kWh	0.0035	0.0048
For the Next 500,000 kWh	0.0034	0.0041
For the Next 2,000,000 kW	0.0032	0.0045

Figure 9

USER	Kwh (Annually)	< 2,000	2,000 - 50,000	50,000-100,000	100,000-500,000	500,000-1M	1M+	Annual Tax Payment	DELTA		
									Annually	Monthly	% Change
Residential Property - Current	12,000	12.20	40.00					\$ 52.20			
Residential Property - Proposed		15.00	62.00					\$ 77.00	\$ 24.80	\$ 2.07	47.51%
Dry Cleaner - Current	17,000	12.20	60.00					\$ 72.20			
Dry Cleaner - Proposed		15.00	93.00					\$ 108.00	\$ 35.80	\$ 2.98	49.58%
Fast Food Restaurant - Current	400,000	12.20	192.00	180.00	1050.00			\$1,434.20			
Fast Food Restaurant - Proposed		15.00	297.60	195.00	1440.00			\$1,947.60	\$ 513.40	\$ 42.78	35.80%
Full Service Hotel - Current	1,200,000	12.20	192.00	180.00	1400.00	1700.00	640.00	\$3,484.20			
Full Service Hotel - Proposed		15.00	297.60	195.00	1920.00	2050.00	900.00	\$4,477.60	\$ 993.40	\$ 82.78	28.51%

The resulting tax proposal would generate approximately \$375,000 in additional revenue and be sufficient to purchase enough RECs to offset 100% of electricity consumption from carbon sources resulting in carbon neutrality and achieving the 2030 energy objective instantaneously. As shown in Figure 9, this tax increase is estimated to cost the average resident an additional \$2.07 per month or \$24.80 per year. In comparison, the same \$375,000 in revenue was generated by increasing the property tax levy it would increase the tax burden to the average \$500,000 home by \$42.00 per year.

The majority of the Working Group felt that the tax proposal would have a huge impact on mitigating GHG emissions for relatively low cost. It was also noted that residents and businesses would be incentivized to pursue energy efficiency improvements to their buildings, resulting in a lower electricity tax payment. Furthermore, it was noted that there are programs available to assist low-income residents and those with a true financial hardship. Lastly, it was noted that the amount of revenue needed from the electric utility tax would decrease each year as the default ComEd energy supply is derived from more renewable energy sources every year, as buildings become more

energy efficient (e.g. solar, wind, insulation, etc.) and as other energy efficiency programs (e.g. Community Solar, Aggregation, etc.) are pursued by the Village.

Due to the highly impactful and highly feasible nature of this program, the Working Group identified community-wide REC purchases as a paramount tactic that could achieve the objective of converting 100% of electricity consumption to renewable sources by 2030. While other energy efficiency programs, such as Community Solar, will continue to be pursued, the “opt-in” nature of those alternative programs are slow and inconsistent with the urgency stated in the energy objective. This is a key distinction that made the community-wide REC purchase program stand out. No other programs were identified that could achieve the stated objective within the established timeframe. Lastly, the Working Group suggested that if at some future juncture there was a federal program resulting in carbon neutral energy production, then the local electric utility tax proposal should be reevaluated.

Dissenting Opinion:

While five members of the Working Group supported the tactic of purchasing RECs and linking that to an electric utility tax increase in order to achieve 100% renewable energy by 2030, two members of the Working Group strongly opposed this approach. The dissenting members felt that this tax would not be palatable to many in the residential or business communities and expressed concern the tax would not be perceived as providing a tangible benefit for the dollars proposed. They saw little support for what they termed a “regressive tax increase”, and instead favored energy efficiency programs that addressed climate change with a more direct and relatable benefit to residents. Citing the global nature of climate change, the dissenting members felt that a nationwide carbon tax was a more appropriate way to address the issue rather than imposing a local tax.

Summary

The Village has long been an innovative leader when it comes to energy efficiency programs. This includes actively retrofitting municipal buildings, offering residents and

businesses energy efficiency programs through partnerships with ComEd and North Shore Gas, facilitating money-saving and carbon footprint-reducing programs on a community-wide scale through Community Choice Aggregation, Community Solar and more. All of these things will continue, program offerings will grow over time and it is expected that incentives will increase while barriers to entry will decrease making these types of energy efficiency offerings more widely available.

While all of that is true, the Working Group prioritized strategies and tactics that could increase the pace of the energy efficiency solutions so that that community could achieve its objective of having 100% of its electricity generated from renewable energy sources by 2030. After studying the focus area of energy in great detail it was determined that the most feasible and most impactful solution to achieving carbon neutral electricity sourcing would be through purchasing RECs on behalf of the entire community. This is a groundbreaking and innovative solution that requires significant investment. The majority of the Working Group favored this tactic and identified a logical nexus of tying the program funding to an electric utility tax proposal because it incentivizes residents and businesses to make energy efficiency improvements to their buildings and, through a weighted average, the tax is imposed on a proportional basis directly tied to a specific user's electricity consumption.

Future energy programs, policies and tactics will tie directly back to the high-level strategies identified in this Chapter. Much work remains in the energy sector with specific short-term focus on energy programs and long-term focus on natural gas solutions.

Resources

The continued identification and support of community-wide energy efficiency programs will be led by Village staff. Development and ongoing facilitation of programs, such as Community Choice Aggregation and Community Solar, require the assistance of expert energy consultants given their complexity. These types of initiatives have most recently

been pursued through efforts of a regional consortium and have achieved economies of scale.

Community outreach, education and advocacy efforts supporting a culture of energy efficiency awareness requires a multitude of stakeholders including formally established commissions, volunteers, economic development engines (such as the Chamber of Commerce) to help engage the business community, and other government/institutional partners such as school districts and the library.

Expenditures associated with continued retrofitting of municipal buildings is not insignificant. Hard costs are associated with consultants to assess and evaluate the appropriateness of retrofits. Purchasing of new, greener appliances can often result in an increased capital expenditure but may result in a decreased operating expense as they consume less energy once in operation. Basic municipal retrofits of lighting fixtures are estimated to be over \$100,000 based on recent quotes.

Notably, the revised electric utility tax proposal is estimated at approximately \$435,000 per year and would cost about \$3.9 million if funded from 2022-2030, depending on changes to the carbon-based source generation in the ComEd default supply and the price of RECs, which fluctuate with market supply and demand.

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TRANSPORTATION

11% of total MTCO2

OBEJECTIVE: REDUCE TRANSPORTATION EMISSIONS BY 55% BY 2030

Discussion: During the Working Group’s analysis it was determined that Transportation accounts for 11% of the total community-wide carbon footprint, or 45,750 MTCO2 for the base year 2017 (see Figure 10). Due to the substantial amount

Figure 10



Source	MTCO2 2017	Percent
<i>Scope 1 (In Boundary)</i>		
Natural Gas	60,185	14%
Transportation	45,750	11%
<i>Scope 2 (Out of Boundary)</i>		
Electricity	150,913	35%
Municipal Energy	2,184	1%
<i>Scope 3 (Purchases: Goods & Services)</i>		
Goods/ Services*	116,000	27%
Food	42,185	10%
Waste	11,581	3%
Total	428,798	100%

of GHG emissions generated from Transportation related sources and the potential impact it could have on mitigating this sector’s carbon footprint, the Working Group prioritized Transportation as a short-term 2030 objective.

Specifically, the Working Group established the **objective of reducing Transportation related emissions by 55% by 2030.**

High-Level Strategies

- Reduce dependence on gasoline powered vehicles by supporting conversion of municipal fleet, residential vehicles and lawncare equipment to electric power
- Support safe and effective bike and pedestrian transportation that promotes sustainable transportation choices
- Maintain a diverse and efficient transportation infrastructure
- Integrate sustainability into transportation policies, programs and regulations

Evaluation – Decarbonize Transportation

When trying to determine the feasibility and cost/benefit associated with promoting strategies and tactics to decarbonize transportation the Working Group began with a review of current Village vehicle sticker sales and an assessment of the Village’s own municipal fleet. According to 2021 Village vehicle sticker sales, approximately 11,232 stickers were sold and of those, approximately 200 were for fully electric vehicles. This equates to approximately 51,667 MTCO₂ from gas powered vehicles (EPA, 2021, para. 4).

The Village municipal fleet is comprised of approximately 55 vehicles and this precise number fluctuates slightly each year. The fleet is comprised of approximately 30% administrative vehicles and 70% heavy-duty or specialty vehicles.

Assessment:

Administrative vehicles include cars, vans and light-duty pickup trucks. These cars are administrative in nature, meaning they are for daily office commuting, inspection vehicles, engineering vehicles or of similar nature. There are approximately 16 vehicles of this nature in the municipal fleet. Heavy-duty or specialty vehicles include police squad cars, street sweepers, 5-ton pickup trucks and other types of public works utility vehicles. There are approximately 39 vehicles of this nature in the municipal fleet.

Notable Tactics – Electric Vehicles

In order to help achieve the high-level strategy of reducing dependence on gas powered vehicles, the Working Group established the specific tactic to:

- Convert 30% of the municipal fleet (or all 16 administrative vehicles) to electric vehicles by 2030
- Convert 90% of the municipal fleet to electric vehicles by 2050
- Convert 50% of residential vehicles to electric vehicles by 2030

Converting 16 administrative vehicles from a gasoline powered combustion engine to an electric motor would result in an estimated annual tailpipe emissions reduction of

73.6 MTCO₂ (EPA, 2021, para. 4). This is a short-term 2030 goal that the Village is already pursuing and the Village expects to receive its first electric vehicle later this year. The longer-term 2050 goal considers that certain heavy-duty or specialty vehicles in the fleet may be challenging to convert to electric vehicles given that the technology is new and still needs time to evolve to the demands placed on these type of work trucks. Therefore, the 2050 goal is established at a 90% gas-to-electric vehicle conversion rate.

Additionally, the Working Group expressed a desire to promote and support residential conversion to electric vehicles. Given the challenges associated with the ambitious goal of reducing residential vehicle emissions by 50%, the Working Group offered the following tactics to help encourage adoption of electric vehicles:

- Installation of municipal Level 2 charging stations in three locations:
 - Village Hall
 - Public Works
 - Public Parking Lot (exact location TBD)
- Encourage the installation of charging stations in commercial, privately owned parking lots
- Adopt building codes that encourage electric vehicle charging stations by making them a permitted use in PUDs and/or certain zoning districts
- Require all new multi-residence developments to be electric vehicle charging station ready by installing prerequisite infrastructure at the time of construction

Converting 50% of residential vehicles to electric vehicles results in a GHG emissions reduction of more than 25,300 MTCO₂ annually (EPA, 2021, para. 4).

Summary

The Village has a long history of devoting financial resources to maintaining transportation infrastructure for vehicles, bicycles and pedestrians. For decades, the Village has utilized various land use and development tools such as: Transit Oriented Developments, Planned Unit Developments and Complete Streets policies to design infrastructure for all types of users and modes of transportation with an emphasis on

interconnectivity, including pedestrian connectivity to public transportation options. These types of organized planning efforts will continue to be pursued to reduce the need for traditional vehicle travel, but new opportunities will be pursued with the rise of technological advances. Notably, the expected growth and advancement of electric vehicles presents the Village with tools to reduce GHG emissions associated with transportation. In the short term, converting significant portions of the municipal fleet from gasoline to electric vehicles and providing new electric vehicle charging station infrastructure for the public are notable tactics that can help the Village accomplish the objective of reducing transportation related emissions by 55% by 2030. In the long term, advancing land use planning policies and increasing public awareness and education around sustainable transportation choices will help to facilitate behavior changes and move people away from gasoline powered transportation.

Resources

Transportation planning will continue to be a major discussion topic during each year's budget planning and multi-year capital improvement plan. The Village has regularly been able to leverage federal and state funds to help advance transportation infrastructure projects and will continue to seek out these types of financial partnerships and opportunities.

The conversion of all 16 administrative vehicles (30% of the entire fleet) from gasoline powered to electric powered vehicles by 2030 is estimated to cost between \$550,000 - \$750,000. Many of these vehicles will be slated for replacement between now and 2030, regardless of the conversion to electric, due to reaching the end of their useful life. While it is expected that electric vehicles will require a modest increase in capital costs to make the initial purchase, the Village should expect to see a similarly proportional decrease in operating costs due to reduced fuel expenses and lower maintenance costs than those which would occur with an internal combustion engine. Fleet mechanics will require additional training to maintain electric vehicles properly, or alternatively, this type of maintenance work may be outsourced.

Installation of electric vehicle charging station infrastructure is significant. Unlike the purchase of replacement vehicles, all of the financial expenditures associated with the installation of charging station infrastructure would be entirely new and would not otherwise occur but for the conversion to electric vehicles. It is estimated that installing the three electric vehicle charging stations, as noted in the tactics discussed above, would cost approximately \$300,000 - \$400,000. However, staff will continue to pursue grant funding to help offset some of these expenses. Additionally, staff is exploring different purchase options - including leasing a charging station rather than owning the station - to reduce the upfront capital costs.

Lastly, staff needs the support of various stakeholder groups and formally established commissions, such as the Sustainability Commission, to help advance the education and awareness efforts related to transportation alternatives discussed above.

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WASTE

3% of total MTCO2

OBEJECTIVE: REDUCE WASTE EMISSIONS BY 66% BY 2030

Discussion: During the Working Group’s analysis it was determined that Waste accounts for 3% of the total community-wide carbon footprint, or 11,581 MTCO2 for the base year 2017 (see Figure 11). Due to the substantial amount of GHG emissions

Figure 11

Source	MTCO2 2017	Percent
<i>Scope 1 (In Boundary)</i>		
Natural Gas	60,185	14%
Transportation	45,750	11%
<i>Scope 2 (Out of Boundary)</i>		
Electricity	150,913	35%
Municipal Energy	2,184	1%
<i>Scope 3 (Purchases: Goods & Services)</i>		
Goods/ Services*	116,000	27%
Food	42,185	10%
Waste	11,581	3%
Total	428,798	100%



generated from Waste related sources and the potential impact we could have on mitigating this sectors carbon footprint the Working Group prioritized Waste as a short-term 2030 objective.

Specifically, the Working Group established the **objective of reducing Waste related emissions by 66% by 2030.**

High-Level Strategies

- Establish baseline landfill diversion goals based on waste stream audits of various user types (e.g. residential, commercial, municipal)
- Enact policies that support waste diversion goals including consideration for hazardous and non-curb-side picked up waste.

- Reduce waste by supporting the systems of a circular economy that regenerate natural systems, design out waste and pollution, and keep products and materials in use
- Provide infrastructure, programs and policies that support composting and recycling materials across all sectors
- Educate and engage the community in waste reduction, diversion and recycling

Waste Baseline and Diversion Opportunities

The Working Group utilized the 2019 Solid Waste Management Plan Update from the Solid Waste Agency of Lake County (SWALCO) to analyze waste baseline information and set diversion rate goals. The 2019 SWALCO plan calculates and measures disposal rates using the unit of pounds per capita per day (pcd). This unit is a consistent way to measure the amount of waste generated per capita per day across municipalities and sectors. In 2017, the Village of Deerfield had a disposal rate of 1.45 pcd. A lower pcd value indicates that homes in the Village are sending less waste to the landfill each day. The Village has met the 2015 disposal rate goal of 1.60 set by SWALCO in their previous County-wide waste plan. SWALCO has since established a new disposal rate goal for Lake County communities of 1.35 pcd by 2030 (SWALCO, 2019 p.2-8). The new goal of 1.35 pcd by 2030 has been previously adopted by the Village’s Sustainability Commission and was again endorsed as a minimum goal to reach by the Working Group.

For reference, a comparison of disposal rates for several Lake County communities is shown in Figure 12.

Figure 12 Source: SWALCO, 2019. * denotes communities meeting 2015 disposal rate goal

SWALCO MEMBER COMMUNITY PROGRESS TOWARDS GOAL DISPOSAL RATE					
SWALCO Member	2014	2015	2016	2017	2018
Antioch	1.32	1.33	1.93	1.95	1.99
Bannockburn	3.88	1.48	2.73	1.96	1.71
Beach Park	1.41	1.84	2.09	1.86	1.97
Deer Park	2.21	2.22	2.14	2.25	2.16
Deerfield*	1.87	1.83	1.85	1.45	1.56
Fox Lake	1.03	1.10	2.21	2.25	1.96
Grayslake	1.38	1.28	1.85	2.04	1.91
Green Oaks*	2.14	1.77	1.81	1.71	1.53
Gurnee	1.30	1.21	1.85	2.04	1.90
Hainesville	2.03	2.10	2.40	2.15	2.30
Hawthorn Woods	2.38	2.36	2.30	1.81	1.84
Highland Park*	1.44	1.63	1.61	1.70	1.58



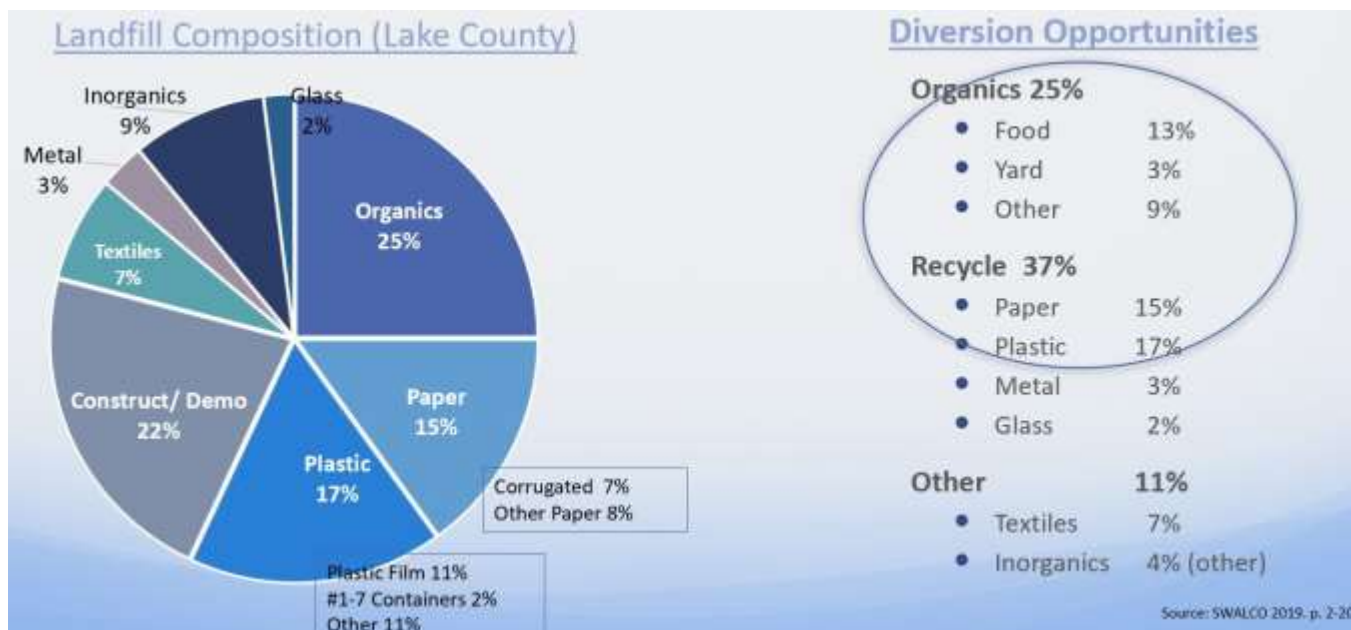
With an understanding of the 2017 disposal rate, the Working Group was able to evaluate waste streams and identify opportunities to further divert materials from the landfill. Based on 2019 SWALCO data for the Village of Deerfield, 44% of the waste stream is residential and 56% of the waste stream is commercial. 33% of the residential waste stream is being diverted from the landfill and only 13% of the commercial waste stream is being diverted from the landfill leaving lots of opportunity to achieve great diversion rates, especially related to commercial waste.

Figure 13



Furthermore, the Lake County landfill composition is made up of 25% organic material and 37% recycling material. 13% of the organic material is food waste and 17% of the recycling material is plastic, most notably plastic film and single-use plastics (SWALCO, 2019, p. 2-20).

Figure 14



Notable Tactics – Year-Round Residential Curbside Composting

The baseline information noted above does not account for the year-round residential curbside composting program that was implemented in April 2021. The Village is just concluding its first year of the program and recent field surveys have indicated that residential organic containers have a 30% utilization rate and preliminary reports indicate that organic diversion rates have increased by as much as 2-4%. Future education and awareness campaigns will focus on increasing residential utilization rates and will also include significant efforts to get commercial properties to increase recycling participation and to begin composting. Recycling and composting services are already available to commercial property owners but need to be further leveraged to incentivize commercial property owners to adopt and implement these services. Achieving broad adoption of recycling and composting programs among residents and commercial property owners will help to achieve the 1.35 pcd diversion rate and reduce waste related emissions. The key focus of future education efforts and programs will be to get organics and plastics out of the landfill. This might require future solid waste contracts to include options for disposing of plastic film at the curb, instead of requiring residents to bring them to a centralized disposal location, which is the current condition.

Summary

The Village has set a diversion goal of 1.35 pcd by 2030. The greatest areas to increase landfill diversion are related to the commercial sector and will require broad adoption of recycling and composting by commercial producers of waste. To be clear, recycling and composting services are being offered to commercial users now but have little utilization. Future solid waste contract negotiations should attempt to establish pricing structures that incentivize behavioral changes that increase diversion rates.

For instance, the current commercial waste contract offers up to 4 cubic yards of recycling to be serviced once a week, free of charge. This type of pricing structure is an attempt to incentivize commercial users to shift their waste streams away from the landfill and to reduce costs by utilizing more recycling services. There may be ways to structure pricing for organic services for commercial property owners in a similar manner with the intent of driving further landfill diversion.

Resources

The Working Group placed a large emphasis on educating and bringing awareness to commercial property owners about the environmental and economic benefits of recycling and composting. In the past, the Village of Deerfield and the Deerfield-Bannockburn-Riverwoods Chamber of Commerce have held joint seminars with restaurants and other commercial users to educate them about the Village's various waste services. These types of events should be repeated on a regular basis but they require significant time to plan and coordination with various stakeholders including SWALCO and the Village's contractual waste hauler.

Similarly, efforts to promote residential curbside composting to the public take significant amounts of staff time and require new innovative techniques including: providing residents with composting toolkits, creating online games and videos, and coordinating curriculum and events with school districts. Advancing community-wide "zero-waste" efforts also requires additional resources in the form of providing public

compost containers and incorporating composting and recycling at Village sponsored events.

If future solid waste hauling contracts are able to achieve reduced rates through competitive bidding, then those savings should be considered for reinvestment into programs that support waste reduction and diversion. Alternatively, if new curbside services, such as plastic film collection, are added to the base service level then end-user rates may increase or necessitate government subsidies and a reallocation of resources.

Due to the complexity and expertise needed, negotiating new contract provisions and creating new and innovative waste diversion programs often requires assistance from outside consultants such as SWALCO and other expert matter advisers. Historically, the advancement of waste diversion programs has required relatively modest hard costs but required very high amounts of soft costs in terms of staff time and attention.

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2050 OBJECTIVES

Ecosystem / Food / Goods & Services

OBJECTIVE: CARBON NEUTRAL BY 2050

Discussion: During the Working Group’s analysis it was determined that the GHG emissions associated with the focus areas of Ecosystem (e.g. land, trees, water), Food and the consumption of Goods/Services were particularly challenging to address in the

Figure 15

Source	MTCO2 2017	Percent
Scope 1 (In Boundary)		
Natural Gas	60,185	14%
Transportation	45,750	11%
Scope 2 (Out of Boundary)		
Electricity	150,913	35%
Municipal Energy	2,184	1%
Scope 3 (Purchases: Goods & Services)		
Goods/ Services*	116,000	27%
Food	42,185	10%
Waste	11,581	3%
Total	428,798	100%



short-term and were instead the focus of the long-term strategy to reach carbon neutrality by 2050. Base year measurements indicate that **Food and Good/Services contribute 37% of the total GHG emissions or 158,185 MTCO2** (see Figure 15).

Ecosystem and land use patterns were largely discussed as mitigation and adaption tools to respond to climate change and increase the community’s resiliency.

High-Level Strategies - Ecosystem

- Increase and sustain a robust tree canopy

- Integrate green infrastructure and resiliency strategies into Village development and planning
- Facilitate conversion to sustainable landscape practices
- Decrease emissions from gas powered lawn and garden equipment
- Educate and engage community on sustainable landscape practices and trees

High-Level Strategies - Food

- Educate and engage community in personal and environmental benefits of eating plant-based diets
- Facilitate offering more plant-based food choices to the public at-large

Evaluation – Ecosystem

Ecosystem was evaluated as it relates to land, water and trees. Several detailed tactics were offered with regard to further encouraging native and drought resistant landscaping, protecting the urban tree canopy and utilizing water as efficiently as possible during everyday municipal operations. For example, the Working Group wanted to pursue tactics that promote native landscaping on residential lots through a native garden registry program and programs that incentivize residents to remove invasive species through a reward/bounty program. Additionally, the Village will continue pursuing efforts to convert publicly-owned open spaces to pollinator/native gardens rather than grass, which requires ongoing turf maintenance and does little to support the broader ecosystem.

The Working Group identified that land use development in the Village is guided through technical documents such as the Village’s Development Code, Subdivision Code, Municipal Code and Zoning Ordinance. In addition, the Tree Preservation Ordinance is another technical tool that serves to protect and preserve the urban forest. Some of these documents have recently been updated to emphasize sustainable practices and the remaining documents will be reviewed in detail by staff to further incorporate sustainable principles, where appropriate. Amendments to the various Codes requires either formal public hearings or a public meeting process, which

allows for public transparency, and cannot be approved administratively. Given this fact, staff will need to receive input from multiple stakeholders including various commissions, multiple departments and legal counsel as part of preparing comprehensive sustainable overhauls to these guiding land use/development documents.

Using the Village’s GIS data and aerial photography, the Working Group identified that 17% of the Village’s impervious surface area is owned by the Village of Deerfield and 83% of the impervious surface area is private property or non-Village owned. It was acknowledged that a stormwater user fee is currently in the research phase and will be further considered by the Village Board later this year. The stormwater fee is intended to be a user fee that equitably charges customers for their use of the Village’s stormwater sewer infrastructure analogous to a water user fee. The fee serves to keep pace with necessary maintenance demands placed on the storm sewer system by all of its users.

Figure 16

	Area sq ft (non village owned)	Acres (non village owned)	Percent (non village owned)	Area sq ft (village owned)	Acres (village owned)	Percent (village owned)	Total (sq ft)
Sidewalk	7,231,062	166.0023416	72.49%	2,743,986	62.99325069	27.51%	9,975,048
Building	37,428,346	859.2365932	99.60%	150,916	3.464554637	0.40%	37,579,262
Paved Area	30,657,055	703.7891414	97.32%	845,217	19.4035124	2.68%	31,502,272
Path	126,123	2.895385675	49.75%	127,387	2.924403122	50.25%	253,510
Recreation Sub Area	1,032,871	23.71145546	96.82%	33,942	0.779201102	3.18%	1,066,813
Road	7,329,746	168.2678145	33.92%	14,282,231	327.8749082	66.08%	21,611,977
Driveway	5,811,419	133.4118228	100.00%	0	0	0.00%	5,811,419
Total	89,616,622	2057.314555	83.13%	18,183,679	417.4398301	16.87%	107,800,301

Evaluation – Food

The Working Group placed a large emphasis on bringing awareness to the environmental and health impacts of meat production and educating the community about the ways that eating a plant-rich diet can reduce our carbon footprint. It was discussed that globally, food is a major contributor to GHG emissions when accounting for elements of the food production process (notably the way land is utilized) and food distribution. The Working Group believed that advocacy was the appropriate tool to help champion this effort opposed to government regulation.

The Village of Deerfield and other governmental entities have the opportunity to lead those advocacy efforts and serve as an example for other industry leaders to follow. This could include tactics such as passing a resolution in support of “Meatless Mondays” and seeking united support from community partners.

The Working Group also suggested various ways to increase the general public’s access to plant-based meals. Those tactics included actions such as identifying partners to host community gardens (e.g. park district, houses of worship, etc.) and to incentivize plant-based restaurants to locate in the Village through possible business license reductions or waivers.

Evaluation – Goods and Services

Goods and Services represent GHG emissions that occur outside the Village due to consumables purchased by residents and businesses within the Village. For instance, this category accounts for the GHG emissions from out-of-boundary transportation, water/wastewater production, electricity transmission and distribution, or other indirect emissions as a result of activities occurring in the Village. This GHG emission estimates for this category were sourced from the University of California-Berkeley Cool Climate Project. Due to the indirect nature of these GHG emissions, many times municipal climate action reports intentionally omit this category from their work plan. Other than the Working Group determining this source of GHG emissions to be a 2050 objective,

no formal evaluation or analysis was conducted. Further consideration should be given to the relevancy of including this category in subsequent climate action reports.

Summary

Ecosystem, Food and the consumption of Goods and Services are the focus of 2050 GHG emission reduction efforts. The Working Group recognized that the high-level strategies associated with these focus areas are intended for long-term planning, but that does not mean that certain actions cannot be implemented now. Planting trees to grow the tree canopy and increasing the amount of ground cover acreage are long-term tactics that can start now and will result in greater carbon sequestration in the future. Additionally, efforts around food education and changing peoples' dietary behavior can take a long time and require years of repeated public messaging. Similarly, launching new economic development tools to attract plant-based retailers and restaurants can also take years before the benefits of such programs are realized. Furthermore, the Working Group acknowledged that these focus areas are less directly tied to GHG emissions but are better framed as discussions related to long-term land use adaption and resiliency. It is in recognition of these types of practical challenges that the Working Group established these focus areas as objectives for 2050.

Resources

Many of the tactics identified in this section require continued and new advocacy efforts to raise awareness and education. Increasing awareness around water conservation has been a multiyear effort of the Sustainability Commission and these efforts need to continue. New educational campaigns will need to be created to raise awareness of the benefits of plant-based diets. This demands significant staff time and content creation often requiring assistance from outside video and media consultants.

Expert consultants and legal resources are also needed to revise municipal governing documents and regulatory codes, such as the Subdivision Code and Zoning Ordinance, so they better capture the sustainable land use practices identified in this report.

As the Village converts its own land from turf to native gardens, upfront capital expenditures are required and ongoing maintenance costs are expected, especially in the first 1-3 years to help the gardens get established. The Village does not have this expertise on staff and has historically contracted with experts to ensure the gardens are established and serve their ecological functions properly. Similarly, as new residential native garden certification programs are created, this same type of ecological expertise will need to be contracted annually. Not accounting for the initial capital costs, it is estimated that an outsourced ecological contract to oversee Village owned and privately-owned native gardens can range from \$60,000-\$100,000 annually. Additionally, the Village maintains a healthy public tree canopy through a combination of in-house and outside consultants with an annual expenditure of approximately \$450,000.

Notably, the stormwater user fee is a separate policy discussion before the Village Board but preliminary estimates indicate that the Village spends \$1 million annually on storm sewer maintenance. This figure does not account for large scale infrastructure/capital improvements but rather represents the cost of simply keeping the current storm sewer system functioning properly.

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CONCLUSION

The Village of Deerfield Board of Trustees recognized the threat that climate change poses to the world and the lead role that municipalities have in mitigating the effects of GHG emissions. As a result, the Village Board convened a Working Group to assess the Village's carbon footprint and to establish a path forward to mitigate our impact.

The Working Group spent approximately six months reviewing key data sources to establish a 2017 GHG emissions baseline and setting high-level objectives to obtain the Village Board's goal of achieving a 45% reduction in GHG emissions by 2030.

Specifically, the Working Group is recommending that the Village Board approve three objectives:

- **Convert 100% of electricity to renewable sources by 2030**
- **Reduce transportation emissions by 55% by 2030**
- **Reduce waste emissions by 66% by 2030**

Achieving the objectives noted above will result in a 45% reduction of GHG emissions compared to the baseline year and satisfy the goal established by the Village Board in the February 18, 2020 Proclamation.

Notably, the Village Board is not being asked to endorse specific strategies and tactics at this time. Should the Village Board accept the report and recommendation of the Working Group, specific programs and policies that are included in this report and detailed in Appendix I will be presented to the Village Board for consideration at a future date.

Next Steps

If endorsed by the Village Board, staff will work with numerous stakeholders including citizen action groups, boards and commissions, sister government agencies and the public at-large to implement the strategies and tactics for each objective over the next 8 years.

Specific tactics will be presented to the Village Board in the form of future programs, policies and requests for resources. This may take the form of future agenda items, requests for purchases, staffing proposals and budget presentations. Additionally, many of the tactics will simply be operationalized into the everyday business decisions of the Village, which has long been part of the Village's sustainability efforts.

This is an initial report drafted without the benefit of expert sustainability consultants or professional subject matter experts. Future consideration should be given to authoring a professional sustainability plan that can refine GHG emission models, offer ongoing forecasting and include a broader discussion of the Village's adaptation and resiliency efforts. One of the first studies recommended would be to complete a 2022 GHG emissions inventory that could be compared to the initial 2017 baseline so that monitoring and forecasting can begin immediately.

Given the ongoing monitoring that is needed to ensure that the Village remains on track with meeting its 2030 goals, it is recommended that formal inventory and forecasting models be completed on a quadrennial schedule. This offers enough time to take into consideration technological advances or new programs and policies that change the context of the climate change discussion. The 4-year cycle is also a short enough interval to allow for strategies and tactics to be revised if they are not meeting the 2030 goal.

Given the scale and urgency of the actions outlined in this report, additional resources will likely be needed. Some items are high-cost, low staff-time but the majority of the action items are determined to be high-staff demand and low-cost relative to the Village's overall budget. Some notable exceptions to this include the suggested REC

program and installation of EV charging station infrastructure. As a service organization, approximately 70% of the Village's annual operating budget is allocated to personnel. The Village's services are delivered by people and as new sustainable programs, initiatives, and policies are enacted, additional personnel devoted to the success and oversight of those programs will likely be required.


The Working Group is thankful to the Village Board for their consideration of this matter and will present the report to the Village Board at the June 6, 2022 meeting.

ENERGY

APPENDIX I

During the Working Group’s analysis, discussion of energy consumption was bifurcated into: (1) electricity generation and (2) natural gas generation. Electricity accounts for 36% of the total community-wide carbon footprint, or 153,097 MTCO2 for the base year 2017. Due the substantial impact electricity consumption has on the overall carbon footprint, the Working Group primarily focused their discussion around strategies and tactics that would achieve the **objective of converting 100% electricity to renewable sources by 2030**.

STRATEGY		Responsible Stakeholder
Use Building Energy More Efficiently		
TACTICS	Conduct energy audits and retrofit municipal buildings, facilities, and street lights for maximum efficiency. [S]	
	Explore opportunities for high performance and net zero new construction. [S]	
	Establish a policy requiring ENERGY STAR appliances for all new Village equipment purchases. [S]	

STRATEGY		Responsible Stakeholder
Reduce Energy Consumption		
TACTICS	Power down equipment when possible. [S]	



Municipal/
Government



Residential



Commercial



Schools



Park District





[S]





Short Term
2030 Goal

[L]

Long Term
2050 Goal

ENERGY

STRATEGY		Responsible Stakeholder
Advance Renewable Energy		
TACTICS	Install and operate renewable energy systems in municipal buildings and facilities. [S]	
	Explore use of power purchase agreements, leasing and other strategies to finance renewable energy systems. [S]	
	Procure renewable energy for public facilities. [S]	
	Collaborate to provide access to Community Solar. [S]	

STRATEGY		Responsible Stakeholder
Engage the Community in Clean Energy Practices and Efficiency		
TACTICS	Engage residential and commercial property owners to optimize building efficiency. [S]	
	Leverage programs such as demand response, energy efficiency incentives, and PACE financing. (Property Assessed Clean Energy). [S]	
	Partner with electric and gas utilities to promote energy efficiency programs to the community. [S]	
	Publicly recognize institutional and private buildings that achieve specific energy efficiency targets. [S]	
	Show public support for installation by hosting solar home tours and incentivizing solar companies to attend public events. [S]	



Municipal/
Government



Residential



Commercial



Schools



Park District

[S]

Short Term
2030 Goal

[L]

Long Term
2050 Goal

ENERGY

STRATEGY		Responsible Stakeholder
<h2>Enact Policies and Programs That Supply Clean Energy</h2>		
TACTICS	<p>Enact Community-wide REC purchase program to offset all carbon sources of electricity (when feasible, purchase RECs that supply Northern Illinois power grid). [S]</p>	
	<p>Adopt current Illinois Energy Conservation Code (IECC) and report compliance. [S]</p>	
	<p>Encourage clean energy systems in residential and commercial building construction and design. [S]</p>	
	<p>Use best practices in each category of green building standards, including aspects of LEED Platinum, Passive House (PHIUS), Green Globes, Living Building Challenge, American Institute of Architects (AIA) 2030, and Enterprise Green Communities. [S]</p>	
	<p>Facilitate installation of renewable energy technologies (e.g. solar, geothermal) through adopting building and zoning codes such as achieving Sol Smart Gold Status. [S]</p>	
	<p>Establish a Solar Ready Ordinance to require residential and encourage all new multifamily residential and commercial buildings to be solar ready based on Village's Solar Ready Guide, with flexibility for site suitability. [S]</p>	
	<p>Consider policy options to transition newly constructed commercial buildings away from natural gas and towards electrification. [S]</p>	



Municipal/
Government



Residential



Commercial



Schools



Park District

[S]





Short Term
2030 Goal

[L]

Long Term
2050 Goal

TRANSPORTATION

During the Working Group’s analysis it was determined that Transportation accounts for 11% of the total community-wide carbon footprint, or 45,750 MTCO2 for the base year 2017. Due to the substantial amount of GHG emissions generated from Transportation related sources and the potential impact we could have on mitigating this sector's carbon footprint, the Working Group prioritized Transportation as a short-term 2030 objective. Specifically, the Working Group established the **objective of reducing Transportation related emissions by 55% by 2030.**

STRATEGY		Responsible Stakeholder
Reduce Dependence on Gasoline Powered Vehicles by Supporting Conversion of Municipal Fleet, Residential Vehicles & Lawncare Equipment to Electric Power		
TACTICS	Advocate for broad adoption of clean fuel fleets for utilities, businesses, other agencies, etc. [S]	
	Replace retiring village fleet vehicles with appropriate zero or low emission alternatives (purchase 16 EV fleet vehicles by 2030). [S]	
STRATEGY		Responsible Stakeholder
Support Safe and Effective Bike and Pedestrian Transportation That Promotes Sustainable Transportation Choices		
TACTICS	Provide bicycle parking at municipal facilities, commercial districts, transit stations and in other public gathering locations. [S]	
	Encourage residents and visitors to walk and bike. [S]	



Municipal/
Government



Residential



Commercial



Schools



Park District
















[S]

Short Term
2030 Goal

[L]

Long Term
2050 Goal

TRANSPORTATION

STRATEGY		Responsible Stakeholder
<h2>Maintain a Diverse & Efficient Transportation Infrastructure</h2>		
TACTICS	Collaborate to provide alternative fuel infrastructure at public sites (install 3 EV stations by 2030). [S]	  
	Incorporate trees and other green infrastructure elements into roadway design and maintenance for functionality and aesthetics. [S]	
STRATEGY		Responsible Stakeholder
<h2>Integrate Sustainability Into Transportation Policies, Programs & Regulations</h2>		
TACTICS	Enact and enforce anti-idling policies for public fleet vehicles. [S]	
	Designate "No Idling" zones at schools, transit stations etc. [S]	  
	Educate the community on the negative impacts of car idling. [S]	    
	Adapt building codes to accommodate and encourage alternate fuel infrastructure (e.g. require all new multi-residence buildings to be capable of level 2 EV charging). [S]	 



Municipal/
Government



Residential



Commercial



Schools



Park District

[S]











Short Term
2030 Goal

[L]

Long Term
2050 Goal

WASTE

During the Working Group’s analysis it was determined that Waste accounts for 3% of the total community-wide carbon footprint, or 11,581 MTCO2 for the base year 2017. Due to the substantial amount of GHG emissions generated from Waste related sources and the potential impact we could have on mitigating this sector's carbon footprint, the Working Group prioritized Waste as a short-term 2030 objective and established the **objective of reducing Waste related emissions by 66% by 2030.**

STRATEGY		Responsible Stakeholder
Establish Baseline Landfill Diversion Goals Based on Waste Stream Audits of Various User Types		
TACTICS	Conduct waste stream audits for municipal operations to identify waste reduction opportunities. [S]	
	Conduct waste stream audits for Residential and Commercial to establish baseline by waste source (mirror Lake County categories). [S]	   
STRATEGY		Responsible Stakeholder
Enact Policies that Support Waste Diversion Goals Including Consideration for Hazardous & Non-Curbside Picked Up Waste		
TACTICS	Collaborate with waste haulers for proper disposal of all types of waste (e.g. hazardous, pharma, electronics, textiles). [S]	 
	Create recycling/reuse outlets to recycle targeted items not accepted by the curbside program (e.g., plastic bags, sheet plastic, shredded paper). [S]	  



Municipal/
Government



Residential



Commercial



Schools



Park District








[S]

Short Term
2030 Goal

[L]

Long Term
2050 Goal

WASTE

STRATEGY		Responsible Stakeholder
TACTICS	Provide year-round curbside recycling/ composting infrastructure community wide. [S]	
	Ensure infrastructure (bin size and accessibility) is consistent with supporting composting, recycling, and landfill goals. [S]	
	Structure waste pricing to be economically advantageous to compost/ recycle, and, economically disadvantageous to landfill waste. [S]	
	Direct Waste Hauler contract savings to fund Waste diversion policies & programs. [S]	
	Add public receptacles (Compost, Recycle, Landfill) in all Village buildings, including impactful visual locations that communicate the benefits/consequences of each. [S]	
	Add plastic film to curbside pick up program. [L]	
	Encourage commercial & multifamily recycling and composting, including making receptacles easily accessible and clearly visible to tenants. [S]	



Municipal/
Government



Residential



Commercial



Schools



Park District

[S]

Short Term
2030 Goal

[L]

Long Term
2050 Goal

WASTE

STRATEGY		Responsible Stakeholder
Reduce Waste By Supporting The Systems Of A Circular Economy That Regenerate Natural Systems, Design Out Waste And Pollution, And Keep Products And Materials In Use		
TACTICS	Ban or discourage the use of products resulting in unmanageable waste (e.g., plastic bags, plastic bottles, other single use plastics). [S]	
	Include composting at Village sponsored public events (e.g., Harvest Fest, Family Days, Winter Market). [S]	
	Eliminate policy barriers to on-site composting. [S]	
	Maintain construction and demolition recycling ordinance and establish incentives for reuse of homebuilding materials rather than disposal. [S]	
	Require food service retailers to use biodegradable, compostable or recyclable packaging. [L]	
	Require reusables for dine-in restaurants and sustainable takeout food wares. [L]	
	Eliminate single use plastics in everyday use at Village facilities. [L]	



Municipal/
Government



Residential



Commercial



Schools



Park District







[S]

Short Term
2030 Goal

[L]

Long Term
2050 Goal

WASTE

STRATEGY		Responsible Stakeholder
EDUCATE AND ENGAGE THE COMMUNITY IN WASTE REDUCTION, DIVERSION AND RECYCLING		
TACTICS	Conduct at least 2 community wide events per year to interact and educate residents on 3rd bin composting, plastics, and recycling (use large scale forums, such as shredding events, to interact with large groups of residents). [S]	
	Partner with Park District, Library and other local government agencies to leverage waste education events. [S]	
	Partner with School Districts 113 and 109 to develop a school wide annual "Zero Waste at Home" program. [S]	
	Plan comprehensive waste diversion events annually including 2X/year electronic collection events, 1X/year paper shredding event, and household chemical waste collection etc. [S]	
	At a minimum, achieve a waste diversion goal of 1.35 pcd by 2030 which is consistent with the 2019 SWALCO Waste Plan. [S]	
	Partner with Chamber of Commerce and other business groups to host peer-to-peer food scrap/composting education events for commercial business operators and restauranteurs. [S]	



Municipal/
Government



Residential



Commercial



Schools



Park District

[S]







Short Term
2030 Goal




[L]

Long Term
2050 Goal

ECOSYSTEM

Ecosystem was evaluated as it relates to land, water and trees. Several detailed tactics were offered with regard to further encouraging native and drought resistant landscaping, protecting the urban tree canopy and utilizing water as efficiently as possible during everyday municipal operations. For example, the Working Group wanted to **pursue tactics that promote native landscaping on residential lots through a native garden registry program and programs that reward residents for removing invasive species.**

STRATEGY		Responsible Stakeholder
Increase & Sustain a Robust Tree Canopy		
TACTICS	Conduct a Village-wide Tree Canopy Survey and Carbon Sequestration Study. [S]	
	Establish species diversity goals and set annual planting targets. [L]	
	Create an invasive tree replacement program. [L]	 
	Preserve the existing canopy via the Tree Preservation Ordinance. [S]	 

STRATEGY		Responsible Stakeholder
Integrate Green Infrastructure & Resiliency Strategies Into Village Development & Planning		
TACTICS	Implement Best Management Practices (BMPs) to reduce water pollution. [S]	
	Provide more habitats for native plants and animals including establishment of native garden registration on private property. [L]	   
	Implement processes that mimic the functions of nature (e.g., bioswales). [S]	   



Municipal/
Government



Residential



Commercial



Schools



Park District







[S]




Short Term
2030 Goal

[L]

Long Term
2050 Goal

ECOSYSTEM

STRATEGY		Responsible Stakeholder
Facilitate Conversion to Sustainable Landscape Practices		
TACTICS	Increase the use of native species and pollinator restoration areas in landscaping. [S]	
	Replace turf with native plantings to withstand drought conditions and reduce the use of herbicides and pesticides. [S]	
	Promote eco-friendly gardening practices. [S]	
	Require native and drought resistant plants in Village approved landscape designs. [L]	
	Create annual "Bounty" Program offering a reward to residents for removal of invasive species. [L]	
	Create ecologist certified residential native garden registry program. [L]	













STRATEGY		Responsible Stakeholder
Decrease Emissions From Gas Powered Lawn & Garden Equipment		
TACTICS	Adopt the use of zero-emission tools to replace two-stroke and four-stroke equipment by village services (i.e., retire and replace gas-powered mowers, blowers, etc.). [L]	
	Adopt policies to reduce or prohibit the use of gasoline-powered residential lawn equipment. [S]	
	Encourage landscape contractors to transition to sustainable practices. [S]	



[S]

[L]

ECOSYSTEM

STRATEGY		Responsible Stakeholder
Educate & Engage Community on Sustainable Landscape Practices & Trees		
TACTICS	Promote/host an annual tree walk and education event. [S]	  
	Promote/host an annual sustainable yard tour program. [S]	 
	Promote/host native plant/tree giveaway events annually. [S]	 
	Partner with Library and community groups to host educational seminars that promote sustainable landscape design around topics such as eradicating invasive species (e.g. buckthorn) and attracting insects, butterflies and other pollinators with native gardens. [S]	   
	Create specific certifications and signage for community partners to display their sustainable landscape efforts. [S]	



Municipal/
Government



Residential



Commercial



Schools



Park District

[S]

Short Term
2030 Goal

[L]

Long Term
2050 Goal

FOOD

The Working group placed great emphasis on bringing awareness to the environmental and health impacts of meat production and educating the community about the ways that eating a plant-rich diet can reduce our carbon footprint. It was discussed that globally, food is a major contributor to GHG emissions when accounting for elements of the food production process notably the way land is utilized and food distribution. The Working Group believes that **advocacy is the appropriate tool to help champion this effort, opposed to government regulation.**

STRATEGY		Responsible Stakeholder
<h2>Educate & Engage Community in Personal & Environment Benefits of Plant-Based Diets</h2>		
TACTICS	Establish and promote organic community gardens on public and private properties. [L]	
	Host a series of educational programs for the public, in collaboration with community partners, on the benefits of plant-based diets. [S]	
	Encourage food stores to promote local and organic foods. [L]	
	Partner with retailers to discourage the use of toxic pesticides and herbicides in gardens. [L]	
STRATEGY		Responsible Stakeholder
<h2>Facilitate Offering More Plant-Based Food Choices to the Public At-Large</h2>		
TACTICS	Encourage residents and community partners to have a completely vegetarian menu once a week (e.g. Meatless Monday campaign). [L]	
	Strive to include options for local, organic or plant-based food at Village-organized events. [S]	
	Incentivize restaurants with plant-based or sustainably-produced protein menus to relocate/open in Deerfield. [L]	
	Partner with community groups such as houses of worship to offer support with winter/year round Farmers Market. [S]	



[S]

[L]

APPENDIX II



CLIMATE

OBJECTIVE

> STRATEGY

+ ADVANCED STRATEGY

Already achieved	In Progress	Planned for next 6 months	Planned for next 12-18 months	Interested in pursuing	Not planned	Not relevant	Contact Initials	Notes	Link to Resource
	X								
				X					Y
		X							Y
		X							
		X							
			X						Y
	X								Y
X									
					X				
					X				Y
X									
					X				Y
	X								
	X								Y
				X					Y
					X				Y
									Y
			X						Y
				X					Y
									Y

CLIMATE

Category

GOAL

Greenhouse Gas Emissions

Reduce greenhouse gas emissions

C1
C1a
C2
C2a
C2b
C+3
C+4
C+5

Establish a Greenhouse Gas (GHG) emission reduction target:
>Utilize US EPA's Local Climate Action Framework to plan and evaluate climate strategies
Measure and monitor GHG emissions
>Measure and monitor GHG from municipal operations
>Measure and monitor GHG community wide
+ Verify and report climate action to Carbon Climate Registry
+ Participate in carbon offset program
+ Commit to the Compact of Mayors

Air Quality

Maintain clean and healthful air

C6
C7
C8
C9
C10
C11

Regulate burning of landscape waste
Facilitate compliance of federal air quality standards by businesses
Participate in Illinois Partners for Clean Air
Discourage the use of high-emitting small engines, such as for landscaping
Reduce volatile organic compound (VOC) emissions for municipal operations by using low VOC cleaners, paints, and paving practices
Establish policies to meet Illinois Dept of Public Health Indoor Air quality standards

Resiliency

Develop resiliency to climate change impacts

C12
C12a
C13
C+14
C+15


Coordinate resiliency efforts with federal, state and regional planning agencies
>Prepare Pre-Disaster Hazard Mitigation Plan
Collaboratively manage urban heat islands
+ Assess infrastructure and public safety threats from extreme weather events
+ Develop a resiliency plan to protect assets, public health, and provide essential services through natural and man-made disasters

Education & Outreach


Engage the community in climate change mitigation and adaptation

C16
C17
C18

Educate the public about climate change
Participate in Cool Communities
Inform the community about air quality index and air pollution action days

ECONOMIC DEVELOPMENT	Category	 GOAL	OBJECTIVE		Already achieved	In Progress	Planned for next 6 months	Planned for next 12-18 months	Interested in pursuing	Not planned	Not relevant	Contact Initials	Notes	Link to Resource	
			> STRATEGY												
			+ ADVANCED STRATEGY												
	Workforce Development	<i>Promote innovation and a competitive workforce</i>	ED1	Connect local businesses with education training, and jobs related to sustainability						X					Y
	ED2		Advocate for the development of a competitive 'green workforce'						X						
	ED3		Advocate for new opportunities in the clean energy industry							X					Y
Innovation		ED4	Encourage green innovation among residents and local businesses				X								
		ED5	Collaborate to support innovation centers						X						Y
Green Economy	<i>Cultivate local and sustainable development, jobs, and businesses</i>	ED6	Attract and retain businesses that practice and promote sustainability				X								
		ED7	Recognize and support businesses who practice and promote sustainability		X										Y
		ED8	Promote local goods and services		X								ON-GOING		
		ED9	Create and promote a community brand featuring natural resources or cultural characteristics of community		X										Y
	ED10	Promote tourism featuring natural and cultural assets of the community		X										Y	
Policy		ED11	Promote the economic prosperity of the community		X										
		ED12	Advocate for expanded job opportunities and sufficient wages		X										


ENERGY	Category	GOAL	OBJECTIVE	Already achieved	In Progress	Planned for next 6 months	Planned for next 12-18 months	Interested in pursuing	Not planned	Not relevant	Contact Initials	Notes	Link to Resource		
														> STRATEGY	
														+ ADVANCED STRATEGY	
ENERGY	Energy Efficiency	Use energy for building and facilities efficiently	E1	> Conduct energy audits of municipal facilities	X							ON-GOING	Y		
			E2	Support energy audits and retro-commissioning studies of residential, commercial and institutional facilities	X								ON-GOING	Y	
			E3	> Conduct retro-commissioning studies to optimize public facility performance		X									Y
			E4	> Implement operational changes recommended in the retro-commissioning study		X									
			E5	Implement energy efficiency measures that have a short-term payback (i.e. lighting, occupancy sensors)	X										Y
			E6	Implement energy efficiency measures that have a longer-term payback					X						
			E7	Collaborate with utilities and other agencies to upgrade streetlight equipment and integrate smart technologies		X									
			E8	Achieve ENERGY STAR certification for municipal buildings					X				WRF		Y
			E+9	+ Utilize performance contracts to finance large energy efficiency projects						X					Y
			E+10	+ Demonstrate extreme energy efficiency with a model Passivhaus building							X				Y
			E+11	+ Budget and plan for long-term energy efficiency equipment upgrades						X					
ENERGY	Renewable Energy	Advance renewable energy	E12	Install and operate renewable energy systems at municipal facilities				X							
			E12a	> Use power purchase agreements, leasing and other strategies to finance renewable energy systems				X				PAST PPA		Y	
			E13	Support the adoption of renewable energy technologies in the community		X									
			E13a	>Adopt codes and permitting practices that support renewable energy systems in the community	X										Y
			E13b	> Facilitate access to renewable energy systems through collaborative purchasing for residents and business					X						Y
			E14	Procure renewable energy for public facilities						X					Y
			E14a	>Become a US EPA Green Power Community		X									Y
			E15	Support procurement of renewable energy through community choice aggregation	X										Y
			E16	Develop renewable energy capacity targeting underutilized public properties (i.e. brownfields)						X					
E+17	+ Collaborate to provide access to community solar	X										Y			
ENERGY	Energy Management	Reduce energy consumption	E18	Power down equipment when possible	X										
			E19	Participate in demand response programs	X										
			E20	Track and benchmark energy consumption through ENERGY STAR Portfolio Manager					X						Y
			E21	Utilize energy management expertise (i.e. Building Operator Certification and Certified Energy Manager)						X					Y
			E22	Participate in energy management challenges and programs						X					Y
			E+23	+ Utilize performance contracts to finance energy efficiency projects when feasible						X					Y
ENERGY	Policy	Enact policies that support clean energy	E24	Adopt current Illinois Energy Conservation Code (IECC) and report compliance									Y		
			E25	Facilitate the adoption of renewable energy technologies (i.e. solar, geothermal) by adapting building and zoning codes	X										
			E+26	+ Collaborate to advance Property Assessed Clean Energy (PACE) policies						X					Y
			E+27	+ Adopt 'stretch codes' setting higher standards for energy efficiency than IECC	X										Y
			E+28	+ Enact an ordinance requiring periodic benchmarking for large energy users						X					Y


Category	 GOAL	OBJECTIVE		Already achieved	In Progress	Planned for next 6 months	Planned for next 12-18 months	Interested in pursuing	Not planned	Not relevant	Contact Initials	Notes	Link to Resource
		> STRATEGY											
		+ ADVANCED STRATEGY											
		E+29	+ Negotiate franchise agreement with utilities to exercise lump sum payment option to finance clean energy						X				
Education & Outreach	<i>Engage the community in clean energy practices</i>	E30	Partner with electric and gas utilities to promote energy efficiency programs to the community	X									Y
		E31	Promote the use of ENERGY STAR certified appliances and equipment					X					Y
		E32	Publicly recognize institutional and private buildings that achieve a specific energy efficiency targets					X					
		E33	Collaborate to educate the community about clean energy options		X								

Category	GOAL	OBJECTIVE	Already achieved	In Progress	Planned for next 6 months	Planned for next 12-18 months	Interested in pursuing	Not planned	Not relevant	Contact Initials	Notes	Link to Resource	
			> STRATEGY										
	+ ADVANCED STRATEGY												
Sustainable Development	<i>Encourage strategic development that upholds sustainability principles</i>	L1 Reduce sprawl by promoting infill development to reduce adverse impacts on natural resources and infrastructure demands							X			Y	
		<i>L1a</i> >Encourage the development of compact and complete residential neighborhoods	X										
		<i>L1b</i> >Protect greenfields and open space						X					
		<i>L1c</i> >Redevelop underutilized or contaminated properties		X									Y
		L2 Prioritize redevelopment projects and infrastructure investment for transit-served locations		X									Y
		<i>L2a</i> >Pursue transit oriented development and transit-supportive land uses in new development	X									ON-GOING	
		<i>L2b</i> >Seek public-private partnerships to create transit-oriented developments	X									ON-GOING	
		L3 Collaborate with neighboring communities to jointly create sustainable developments							X				
		L4 Encourage conservation design to protect natural resources						X					Y
		L5 Promote Sustainable Sites Certification for commercial and institutional landscapes							X				Y
		L6 Integrate resiliency into land development decisions							X				Y
		L7 Support local food production by assuring access to affordable land								X			
		L8 Evaluate proposed developments for on groundwater levels and water quality.							X				
Land Preservation	<i>Conserve restore and enhance natural features and ecosystems</i>	L9 Using data such as the Green Infrastructure Vision and the Illinois Natural Areas Inventory, watershed plans, identify key natural assets, landscape features, parcels with high value for connectivity and ecosystem function						X				Y	
		L10 Conserve key natural assets and open space	X										
		<i>L10a</i> >Through direct acquisition and management						X				Y	
		<i>L10b</i> >Through collaborations and cooperative agreements such as conservation easements						X				Y	
		L11 Guide future development to conserve natural topography, views, drainage patterns, existing vegetation, and historic or cultural assets		X									
		L12 Prioritize the acquisition, dedication and management of lands to create connected greenways		X									
		L13 Prioritize the acquisition of land to protect groundwater recharge areas		X									
		L14 Manage public and private landscapes to optimize ecosystem services and support biodiversity		X									Y
		<i>L14a</i> >Collaborate to restore prairie, wetland, forest and other important ecosystems in the community		X									
		<i>L14b</i> >Monitor and control invasive species in natural areas and throughout the community		X									Y
		<i>L14c</i> >Ensure long-term maintenance and management of protected natural areas within Conservation Design development							X				
L15 Protect and restore soil integrity		X											
<i>L15a</i> >Enforce soil erosion and sediment control regulations for construction sites		X											
Parks & Open Space	<i>Support networks of accessible, well-used and enjoyable parks</i>	L16 Develop a park and open space master plan							X				
		L17 Maximize the amount of public spaces and parks accessible to residents							X				
		<i>L17a</i> >Collaborate to provide access to under-utilized land (i.e. utility right of ways) for trails, community gardens, and sustainable landscapes						X					
		<i>L17b</i> >Optimize linkages between parks and open spaces					X						
		<i>L17c</i> >Work with developers to integrate and develop open space reserves and trails in developments						X					
		<i>L17d</i> >Collaborate with private property owners to create vibrant public gathering spaces (placemaking)						X				Y	
		L18 Enhance parks, open space, and recreational opportunities accessible to all residents							X				
		<i>L18a</i> >Collaborate with park and forest preserve districts		X									
		<i>L18b</i> >Collaborate to create and maintain hiking, biking, canoe and other recreational trails						X					
		<i>L18c</i> >Collaborate to provide accessible recreational services involving parks and open space						X					
L19 Foster healthy community relationships through the use of open space						X							


Category	GOAL	OBJECTIVE	Already achieved	In Progress	Planned for next 6 months	Planned for next 12-18 months	Interested in pursuing	Not planned	Not relevant	Contact Initials	Notes	Link to Resource		
			> STRATEGY											
			+ ADVANCED STRATEGY											
Urban Forestry	Sustain a robust urban forest canopy	L20	Conduct a community wide urban tree canopy assessment or collaborate on a regional study				X							
		L21	Conduct an inventory and assessment of trees on public right of ways	X										
		L22	Develop and implement a management plan to assure a long term vitality of the urban forest		X								Y	
		L23	Maintain the health and integrity of existing trees		X									
		L23a	>Maintain the health of trees on public right of ways		X									
		L23b	>Collaborate with utilities to maintain trees compatible with overhead powerlines		X								Y	
		L23c	>Practice integrated pest management to sustain urban forest health		X								Y	
		L23d	>Assess structural integrity of trees and proactively mitigate risks through strategic removal and other actions		X								Y	
		L24	Plant trees to sustain and renew the urban forest	X								ON-GOING	Y	
		L24a	>Continually plant hardy, site-appropriate trees to meet tree canopy goals		X							ON-GOING	Y	
		L24b	>Engage resident in public stewardship through cost-share planting programs		X							50/50		
		L24c	>Using canopy analysis data, strategically plant trees to optimize public health and stormwater benefits						X					
		L25	Diversify the urban forest for long term resilience		X									
		L26	Earn recognition for urban forest stewardship as a Tree City USA	X										Y
		L27	Harvest and utilize high value wood products from trees that must be removed						X					Y
		L+28	+ Optimize tree planting and protect existing trees for maximum carbon storage/sequestration and energy savings	X										Y
Landscapes	Sustain beautiful landscapes that provide ecosystem services	L29	Manage traditional, cultivated landscapes sustainably		X									
		L29a	>Replace turf with sustainable landscaping alternatives						X					
		L29b	>Manage lawns using natural products and low-impact practices		X									
		L29c	>Encourage community-wide use of integrated pest management to reduce impacts from fertilizers and pesticides					X						
		L29d	>Use integrated pest management strategies for municipal landscapes to reduce impacts from fertilizers and pesticides		X								Y	
		L30	Increase the quality and amount of sustainable landscaping in the community		X									
		L30a	>Use native and sustainable landscaping on municipal properties		X									
		L30b	>Promote native and sustainable landscaping initiatives community wide by connecting residents to plants and information		X								Y	
		L30c	>Increase the amount of sustainable landscaping in the community through subdivision and development codes		X									
		L30d	>Encourage planting and registering of pollinator gardens through the Million Pollinator Garden Challenge		X								Y	
L30e	>Adopt the Mayors Monarch Pledge		X								Y			
L31	Maintain beautiful landscapes and streetscapes to enhance gateways, business districts and important public spaces	X										Y		
Policy	Achieve greater livability through sustainable land use and housing policies	L32	Adopt codes and incentives that guide sustainable development that maximizes social benefits and minimizes infrastructure demands		X									
		L32a	>Modify zoning and building regulations to allow mixed-use		X									
		L32b	>Use zoning and development regulations in strategic locations to increase walkability		X									
		L32c	>Promote site design that encourages the development of vibrant, walkable, commercial areas		X									
		L33	Enact and enforce land use policies that protect valuable natural assets and support resiliency					X						
		L33a	>Enact and enforce land-use policies that preserve open space						X					
		L33b	>Enact and enforce policies that preserve and restore functioning wetlands		X							RETENTION BASINS		
		L33c	>Enact policies that require conservation design best management practices to protect natural resources						X				Y	
L33d	>Protect sensitive aquifer areas via land use regulations							X						
L33e	>Protect key natural assets and open space through zoning and planned unit developments								X					
L33f	>Enact and enforce a tree preservation ordinance to protect valuable trees on private property	X												

Category	GOAL	OBJECTIVE	> STRATEGY	+ ADVANCED STRATEGY	Already achieved	In Progress	Planned for next 6 months	Planned for next 12-18 months	Interested in pursuing	Not planned	Not relevant	Contact Initials	Notes	Link to Resource				
LAND Education, Outreach & Engagement	Cultivate a conservation ethic in the community	L34	Integrate resiliency strategies into development policies and plans					X						Y				
		L35	Facilitate the retention of farms and other working lands							X								
		L36	Enact an ordinance that requires ample sustainable tree and landscape planting for new development and redevelopments					X										
		L37	Collaborate with state and federal partners to prepare for and respond to invasive pest threats							X					Y			
	L38	Engage the community in programs and special events to celebrate nature, such as Arbor Day and Earth Day	X											Y				
	L39	Educate the community about the value of trees, native and sustainable landscaping		X														
	L40	Engage community volunteers in land stewardship activities on public and shared landscapes		X										Y				
	L41	Educate city staff about forest, wetlands and prairie best management practices		X														
	L42	Encourage beautiful, sustainable landscaping on private property						X						Y				
	L43	Enlist volunteer groups to help in acquisition and stewardship of public lands		X										Y				
L44	Engage residents through a natural resources, conservation and/ or tree commission									X								
L45	Educate planning commissioners about sustainable development principles and conservation strategies		X															
L46	Engage local farmers to adopt conservation practices									X								


LEADERSHIP	Category	 GOAL	OBJECTIVE		Already achieved	In Progress	Planned for next 6 months	Planned for next 12-18 months	Interested in pursuing	Not planned	Not relevant	Contact initials	Notes	Link to Resource
			> STRATEGY											
			+ ADVANCED STRATEGY											
Leadership	Enlist support for GRC2 goals through regional, state and national leadership	LP1	Engage with academia and non-governmental organization to support the GRC2							X				
		LP2	Engage with state and national municipal associations to align actions with GRC2							X				Y
		LP3	Report local and regional environmental data to advance national and international collaborative efforts (e.g., GHG reporting, water supply planning)				X							
		LP4	Share information about municipal leadership in sustainability broadly in the community and externally		X									
		LP5	Seek recognition for community sustainability achievements		X									Y
Advocacy	Advocate for policies that align with and advance the GRC2	LP6	Advocate for state policies and investment that support municipal advances in sustainability		X									
		LP7	Advocate for federal policies and investment that support municipal advances in sustainability		X									
		LP8	Seek collaboration with the business sector to support municipal sustainability, (e.g., product stewardship)		X							COMPOST	Y	
Collaboration	Work collaboratively towards a sustainable region	LP9	Partner with other local governments to achieve efficiency and sustainability	X								NSEAC		
		LP10	Participate with regional, state and federal initiatives to plan and achieve sustainability					X						
		LP11	Partner with non-governmental organization to advance sustainability in the community and regionally		X									


MOBILITY	Category	GOAL	OBJECTIVE	Already achieved	In Progress	Planned for next 6 months	Planned for next 12-18 months	Interested in pursuing	Not planned	Not relevant	Contact Initials	Notes	Link to Resource		
				> STRATEGY										Notes	Link to Resource
				+ ADVANCED STRATEGY											
															
MOBILITY	Bike and Pedestrian	Support safe and effective active transportation	M1	Identify gaps in pedestrian and the bicycle networks and barriers to active modes of travel	X								Y		
			M2	Create a bicycle and pedestrian plan to improve connectivity in the community and beyond				X							
			M3	Implement recommendations from the bicycle and pedestrian plan					X					Y	
			M3a	>Earn Bicycle Friendly Community designation				X						Y	
			M3b	>Earn Walk Friendly Community designation				X						Y	
			M4	Collaborate with regional partners to connect on-and off-road bicycle facilities with existing and planned regional trail networks	X										
	M5	Provide bicycle parking at municipal facilities, business districts and transit stations and in neighborhoods	X										Y		
	Transportation Infrastructure	Maintain a diverse, safe and efficient transportation network	M6	Maintain streets and sidewalks for efficiency and safety without harming natural resources	X										
			M7	Maintain efficient traffic flow within and around the community		X									
			M8	Synchronize traffic signals to reduce vehicle idling	X										
			M9	Incorporate sustainable roadways into capital improvement planning, proactively plan for major transportation infrastructure improvements		X									
			M10	Collaborate to develop transportation infrastructure with context sensitivity		X							COMPLETE ST	Y	
			M11	Coordinate with regional transportation agencies to maximize bicycle, pedestrian, vehicular transit, and rail connectivity and mobility		X									
			M12	Collaborate to provide alternative fuel infrastructure at public sites					X						
M13			Incorporate trees and other green infrastructure elements into roadway design and maintenance for functionality and aesthetics		X										
M+14	+ Use the Envision checklist and infrastructure sustainability rating system to guide project development					X					Y				
Stewardship	Support efficient transportation that uses resources wisely	M15	Support regional transportation innovation		X										
		M16	Support coordinated investment to improve efficiency in passenger and freight railroads		X						METRA PILOT				
		M17	Collaborate to support a network of alternate fueling infrastructure					X							
		M18	Advocate for broad adoption of clean fuel fleets (i.e utilities, businesses, other agencies etc.)					X							
		M19	Support strong national fuel efficiency standards					X							
		M20	Seek both public and private partnership to finance transportation system improvements					X							
		M21	Strategically manage parking policies and priorities to advance sustainability					X					Y		
M22	Create Safe Routes to School					X					Y				
Policy	Integrate sustainability into transportation policies, programs and regulations	M23	Enact and enforce anti-idling policies for public fleet vehicles	X											
		M24	Designate no idling zones at schools, transit stations etc.	X											
		M25	Adapt engineering standards to incorporate sustainable practices into roadway construction and maintenance while assuring public safety		X										
		M26	Adapt building codes to accommodate and encourage alternate fuel infrastructure					X							
		M27	Adopt a Complete Streets policy to benefit all road users	X									Y		
		M28	Revise subdivision code to promote active transportation, i.e., street sanctions that require bicycle facilities and sidewalks					X					Y		
Shared-use Mobility	Promote public and sustainable transportation choices	M29	Collaborate to maintain and enhance transit facilities		X										
		M30	Collaborate to expand regional transit capacity and improve service		X										
		M31	Expand local transit connections to meet identified needs		X						REVA				
		M32	Collaborate to provide multi-modal transportation options to resolve the first and last mile barrier		X						SHUTTLE BUG				
		M33	Encourage municipal employees to use alternative modes of transportation to commute to work					X							
each		M34	Encourage residents and visitors to walk and bike					X				Y			
		M35	Promote the availability of regional transit options		X							Y			


MOBILITY	Category	GOAL	OBJECTIVE	Already achieved	In Progress	Planned for next 6 months	Planned for next 12-18 months	Interested in pursuing	Not planned	Not relevant	Contact Initials	Notes	Link to Resource
Education & Outreach	Promote public and sustainable transportation choices	M36	Collaborate with the community's largest employers to offer flex scheduling, telecommuting, public and active transportation		X								
		M37	Educate the community on the negative impacts of car idling		X								Y
		M38	Advocate for mass transit funding		X								
		M39	Encourage active transportation and community building in an open streets event						X				Y

Category	 GOAL	OBJECTIVE		Already achieved	In Progress	Planned for next 6 months	Planned for next 12-18 months	Interested in pursuing	Not planned	Not relevant	Contact Initials	Notes	Link to Resource		
		> STRATEGY													
		+ ADVANCED STRATEGY													
MUNICIPAL OPERATIONS Lead by Example	<i>Lead by demonstrating sustainable values and practices</i>	MO1	Support or create an interdisciplinary team to coordinate internal sustainability efforts						X						
		MO2	Dedicate staff to direct sustainability initiatives	X											
		MO3	Leverage state/federal and private grants and resources to advance sustainability	X											
		MO4	Educate and train staff on sustainability practices	X											
		MO5	Achieve third party certification for sustainable public facilities	X										Y	
		MO5a	>Achieve LEED or Green Globes certification for public buildings	X										Y	
		MO5b	>Achieve Sustainable Sites Certification for public landscapes							X				Y	
		MO5c	>Achieve ENVISION certification for public infrastructure							X				Y	
		MO6	Formalize sustainability goals and plans	X											
		MO6a	>Adopt the Greenest Region Compact			X								Y	
		MO6b	>Use the GRC Framework to create a sustainability plan and formally adopt it			X								Y	
		MO+7	Consolidate and/or share the delivery of public services with other local governments	X										Y	
		MO+8	+ Establish municipal finance practices to re-invest cost savings into sustainability initiatives	X									AGG 2.0		
Sustainable Operations	<i>Integrate sustainability into all municipal operations</i>	MO9	Adopt an environmental purchasing policy						X				X		
		MO10	Extend useful life of physical assets	X											
		MO11	Manage special events sustainably	X									Y		
		MO+12	Integrate sustainability into capital planning	X											
		MO+13	Inventory, assess and manage municipal assets sustainably					X							
MUNICIPAL OPERATIONS Municipal Fleet	<i>Operate a safe, clean and efficient fleet</i>	MO14	Operate a safe, clean and efficient fleet	X											
		MO14a	>Conduct baseline fleet analysis						X				Y		
		MO14b	>Optimize fleet performance by reconciling tasks and vehicle types							X					
		MO14c	>Increase fleet efficiency through driver education and training							X					
		MO14d	>Modify and retrofit vehicles to use alternate fuels							X			Y		
		MO14d	>Migrate fleet to alternate fuel vehicles					X					Y		
		MO15	>Certify as an IEPA Illinois Green Fleet							X			Y		
		MO15	>Join Chicago Area Clean Cities Coalition and report reduction of petroleum fuel consumption annually							X			Y		
MO+17	+ Collaborate with businesses, industry leaders and other agencies to develop alternative fuel infrastructure							X							
Data Management	<i>Collect and manage data to advance sustainability</i>	MO18	Track, analyze and manage data to advance sustainability			X							Y		
		MO18a	>Establish performance metrics			X									
		MO18b	>Collect and organize data			X									
		MO18c	>Report and share data			X									
		MO18d	>Continue to track and monitor data over time			X									
		MO+10	+ Use 'smart' technology to efficiently manage waste, water, fleet, air and energy data							X					


Category	GOAL	OBJECTIVE		Already achieved	In Progress	Planned for next 6 months	Planned for next 12-18 months	Interested in pursuing	Not planned	Not relevant	Contact Initials	Notes	Link to Resource	
														> STRATEGY
														+ ADVANCED STRATEGY
Arts and Culture	Promote cultural vibrancy in the community	SC1	Preserve and maintain the community's historic assets		X							DAHS		
		SC2	Integrate historical and cultural assets through community programming		X								DAHS	
		SC3	Formalize support for culture and the arts		X								FAC	
		SC4	Engage community volunteers through an arts/culture-oriented citizen advisory group		X								FAC	
		SC5	Foster understanding of diverse cultural traditions		X								LIB/FAC	Y
		SC6	Promote beauty and livability in community design, stewardship, and through partnerships		X									
Health & Safety	Foster a culture of health, safety and wellness	SC7	Protect all residents from the effects of pollution		X									
		SC8	Create a community that is resilient and well-prepared for disaster		X									
		SC9	Connect community members to existing services that support health and wellness		X								CLEARINGHOUSE	
		SC10	Ensure high quality essential human services programs are available and utilized		X									
		SC11	Collaborate with state and federal partners to prepare for and respond to pest and disease threats to public health		X								COVID-19	
		SC12	Collaborate to offer active and healthy lifestyle programs to residents								X		PARK DIST	
		SC+13	+ Support balanced, active play for families								X		PARK DIST	Y
		SC+13a	>Become recognized as a Playful City USA								X		PARK DIST	Y
		SC+14	+ Prioritize safe practices and collaborate to reduce accidental injuries and death					X						
		SC+14a	>Become certified as a Safe Community							X				Y
		SC+15	+ Integrate planning, policies and programs to accommodate residents of all ages and abilities					X					CRC	
Local Food	Increase access to sustainably grown local food	SC16	Educate and engage the community in a sustainable food culture				X							
		SC17	Incorporate local and healthy options into public food-service procurement and events		X									
		SC18	Support and promote family and community gardens		X								NATIVE GARDENS	
		SC+19	+ Analyze and assess the current food system							X				
		SC+20	+ Support innovative technologies for food production and distribution							X				
Social Justice	Sustain community principles that are welcoming, inclusive and equitable	SC21	Cultivate and preserve a welcoming and inclusive community character		X							PLEDGE; ONGOING	Y	
		SC22	Support social justice and equity throughout the community		X							CRC	Y	
		SC23	Promote diversity of housing stock accessible to diverse residents		X								Y	
		SC24	Distribute public services and resources equitably in the community		X								ONGOING	
Sustainable Community	Promote a sustainable identity for the community	SC25	Promote third party certification for sustainable private facilities					X				LEED		
		SC25a	>Promote green certification for private buildings					X					Y	Y
		SC25b	>Promote ENVISION certification for private infrastructure					X					Y	
		SC26	Develop and maintain a community brand that highlights sustainability		X								Y	
		SC26a	>Participate in the Green Office Challenge						X				Y	
		SC+27	+ Assess sustainability achievements relative to comparable cities		X									
		SC27a	>Participate in the STAR Community Rating System						X				Y	
		SC28	Incentivize green building in new construction and re-construction							X			Y	
Policy	Assure local policies and codes support sustainability	SC29	Identify existing Code impediments sustainable building and site best practices					X						
		SC30	Develop housing policies, programs, and regulations designed to support and promote sustainability					X						
		SC31	Revise and/or develop codes to promote sustainable building and site practices					X						
		SC32	Enact policies to preserve dark skies						X				Y	
		SC+33	+ Incentivize green building in new construction and re-construction						X				Y	
		SC+34	+ Require third-party green building certification for appropriate new construction							X				

Category	 GOAL	OBJECTIVE		Already achieved	In Progress	Planned for next 6 months	Planned for next 12-18 months	Interested in pursuing	Not planned	Not relevant	Contact Initials	Notes	Link to Resource		
		> STRATEGY													
		+ ADVANCED STRATEGY													
Education	Cultivate community values based on principles of sustainability	SC35	Educate the community about sustainability initiatives using existing municipal communication outlets (i.e., cable TV, newsletters)		X										
		SC36	Assure community education messages are accessible in all languages and formats						X						
		SC37	Use community festivals, lectures, workshops and other events to share information about sustainability		X										
		SC38	Distribute sustainability information and resources provided by other allied organizations and government agencies		X									Y	
		SC39	Collaborate to incorporate sustainability into school curricula		X										
		SC40	Collaborate to assure equitable access to quality education in the community					X							
		SC+41	+ Formalize an environmental education strategy		X								SUST ANNUALLY		
		SC+42	+ Develop/ distribute a green building manual						X						
	Outreach and Engagement	Cultivate community values based on principles of sustainability	SC43	Utilize strategic partnerships with other community organizations to promote sustainability		X							PK, LIB, GO GREEN, E		
			SC44	Participate in regional and national sustainability networks		X							NSEAC		
			SC45	Encourage the community to participate in sustainability initiatives and events		X									
			SC46	Establish or strengthen an inter and intra/agency Green Team			X							WORKING GROUP	
			SC47	Engage residents in sustainability initiatives through an environmentally-focused citizen advisory group		X								SUST	
			SC48	Foster positive communication and collaboration among local and regional institutions		X									
SC49			Reach out and remove barriers to include all residents in civic affairs		X										
SC50			Host environmentally focused event(s)		X										
SC51			Encourage residents and businesses to contribute their time and resources to sustain the community		X									Y	
SC52			Promote green building practices to residents, businesses and developers					X						Y	
	SC+53	Create an award or recognition program to encourage and report sustainable behaviors for residents at home					X					Y			
	SC+54	Create an award or recognition program to encourage and report sustainable actions by local businesses					X					Y			

WASTE & RECYCLING	Category	 GOAL	OBJECTIVE	Already achieved	In Progress	Planned for next 6 months	Planned for next 12-18 months	Interested in pursuing	Not planned	Not relevant	Contact Initials	Notes	Link to Resource		
			> STRATEGY												
			+ ADVANCED STRATEGY												
WASTE & RECYCLING	Waste Reduction	Support sustainable material management	WR1 Set a specific waste reduction goal:	X								1.35 PCD			
			<i>WR1a</i> > Set a waste reduction goal for municipal operations				X								
			<i>WR1b</i> > Set a waste reduction goal for the community	X											
			WR2 Promote and practice waste reduction & recycling in municipal operations	X											
			WR53 Reduce the use of paper in municipal offices		X										
			WR4 Conduct waste audits to identify waste reduction opportunities					X							Y
			WR5 Support exchange of goods and services among residents (i.e. Rummage Sale, Sporting Goods Swap)							X					
			WR+6 + Adopt a Pay-As-You-Throw program							X					
			WR+7 Support by-product synergies among industries							X					Y
			WR+8 Make public events "zero waste"						X						Y
WASTE & RECYCLING	Recycling	Recycle materials across all sectors	WR9 Establish and strive for specific recycling goals:												
			<i>WR9a</i> > Establish and strive for a residential recycling goal		X								1.35 PCD		
			<i>WR9b</i> > Establish and strive for a multi-family recycling goal					X							
			<i>WR9c</i> > Establish and strive for a commercial & institutional recycling goal					X							
			WR10 Provide curbside recycling for residents	X											
			WR11 Provide access to recycling infrastructure and services at public places	X										DOWNTOWN	
			WR +12 Support regional efforts for developing a food scrap composting services	X										CURBSIDE	Y
WASTE & RECYCLING	Waste Diversion	Divert waste from landfills	WR13 Collaborate to Support proper disposal of:												
			<i>WR13a</i> > Support proper disposal of household hazardous waste	X									SWALCO		
			<i>WR13b</i> > Support proper disposal of pharmaceutical and personal care product waste	X										PD	
			<i>WR13c</i> > Support proper disposal of fats, oils and grease (FOGs)	X										CD	
			<i>WR13d</i> > Support proper disposal of electronic waste	X										SWALCO	
			WR14 Collaborate to provide recycling service for items not suitable for curbside pickup e.g. clothing, shoes, Christmas trees and lights		X									SWALCO	
			WR15 Facilitate biosolid re-use in the community (e.g. landscaping)							X					Y
WASTE & RECYCLING	Policy	Enact policies that cause sustainable material management	WR16 Require commercial & multi-family recycling		X							ENCOURAGEMENT	Y		
			WR17 Establish a construction & demolition recycling policy	X											
			WR18 Eliminate policy barriers to on-site composting		X										
			WR19 Engage with Solid Waste agencies to manage waste sustainably	X											Y
			WR20 Ban or discourage the use of products resulting in unmanageable waste (e.g. plastic bags)							X					
WASTE & RECYCLING	Education & Engagement	Engage the community in waste reduction and recycling	WR21 Educate the community on recycling and composting practices		X								Y		
			WR22 Educate the community to reduce waste by consuming less and reusing		X									Y	
			WR23 Discourage fly dumping and littering	X											
			WR24 Organize a community wide clean-up day						X						
			WR25 Engage community volunteers in recycling education and events		X										

Category	 GOAL	OBJECTIVE		Already achieved	In Progress	Planned for next 6 months	Planned for next 12-18 months	Interested in pursuing	Not planned	Not relevant	Contact Initials	Notes	Link to resource	
		> STRATEGY												
		+ ADVANCED STRATEGY												
WATER	Water Conservation <i>Use and distribute water efficiently</i>	W1	Reduce community water consumption per capita						X					
		<i>W1a</i>	>Implement water efficiency measures at all municipal facilities					X						
		<i>W1b</i>	>Encourage residents and businesses to identify and mitigate water loss		X									Y
		W2	Become a US EPA WaterSense Partner					X						Y
		W3	Designate a staff Water Conservation Coordinator to manage water conservation programs						X					
		W4	Participate in regional efforts and programs to conserve water						X					
		<i>W+5</i>	Provide customer incentives to retrofit using high efficiency, Water Sense appliances and fixtures						X					Y
		<i>W+6</i>	Provide water use audits to customers					X						
		<i>W+7</i>	Collaborate with energy utilities to integrate water conservation into energy audits for residential customers		X									
	<i>W+8</i>	Collaborate to encourage commercial, industrial and institutional customers to conserve water					X						Y	
	Water Quality <i>Protect and improve water quality</i>	W9	Protect surface and groundwater from runoff and contamination		X								ILLICIT DISCHARGE	
		<i>W9a</i>	>Avoid the use of coal tar sealants on municipal property		X								BANNED VILLAG	Y
		<i>W9b</i>	>Resolve to eliminate unnecessary landscape pesticides and fertilizer use on municipal property		X									Y
		<i>W9c</i>	>Use sensible salting strategies to reduce chloride contamination		X									Y
		W10	Collaborate to identify sensitive aquifer recharge areas						X	O				Y
		W11	Support post-development runoff reduction and mitigation		X									
		W12	Inventory and inspect septic systems							X				
	W13	Collaborate with regional initiatives to protect Lake Michigan and the Mississippi River		X									NBWS GROUP	
	W14	Label storm drains indicating the destination of discharge		X									SOME	
	Water Infrastructure <i>Manage water system assets sustainably</i>	W15	Operate an efficient water utility that delivers clean, healthful, water		X									
<i>W15a</i>		>Control water loss by auditing water supply system using AWWA protocols		X									Y	
<i>W15b</i>		>Periodically detect system leaks and develop a strategic plan for repair		X									Y	
W16		Comprehensively and sustainably manage water infrastructure		X										
<i>W16a</i>		>Develop a water infrastructure asset management plan to sustain the system		X									Y	
<i>W16b</i>		>Implement the water infrastructure asset management plan to sustain the system		X										
<i>W16c</i>		>Meter 100% of customers with automated reading technology		X										
<i>W16d</i>		>Implement sub-metering for multi-family housing customers							X					
<i>W16e</i>		>Detect and repair water system leaks		X										
<i>W16f</i>		>Repair and replace inefficient water supply infrastructure		X										
<i>W16g</i>		>Support property owners in timely repair of service lines through third-party warranty program							X				Y	
W17		Invest water revenues into sustaining water infrastructure		X										
W18		Coordinate street, utility and water infrastructure projects		X										
W19		Seek both public and private financing partnerships for infrastructure improvements		X										
W20	Riparian communities: Collaborate with other agencies to assess dam performance and support removal when								X			Y		
Infrastructure	W21	Participate in the Community Rating System for flood mitigation and planning		X									Y	
	W22	Participate in the National Flood Insurance Program allowing residents to access flood insurance		X										
	W23	Implement green infrastructure best management practices on municipal properties						X						
	<i>W23a</i>	>Build or retrofit paved surfaces with permeable materials							X					
	<i>W23b</i>	>Install and maintain bioswales, filter strips, trees, rain gardens, and other functional landscapes		X										

WATER	Category	GOAL	OBJECTIVE	Already achieved	In Progress	Planned for next 6 months	Planned for next 12-18 months	Interested in pursuing	Not planned	Not relevant	Contact Initials	Notes	Link to resource		
				> STRATEGY										Notes	Link to resource
				+ ADVANCED STRATEGY											
WATER	Stormwater Management and Green Infr	Optimize the use of natural and built systems to manage stormwater	W24	Encourage residents and businesses to adopt green infrastructure practices				X							
			W24a	>Collaborate to provide rain barrels, plants and other resources to allow resident to capture and store rainwater	X										
			W25	Encourage residents and businesses to reduce flood risks on their property	X										
			W25a	>Incentive overhead basement sewer conversion					X						
			W25b	>Encourage property owners to disconnect downspouts from sewers and direct flow to landscaping					X						
			W26	Enhance natural features of stormwater detention and retention systems	X										
			W27	Collaborate to enhance wetlands for improved ecosystem services	X									DETENTION BASINS	
			W28	Collaborate with regional and state agencies to sustainably manage stormwater	X										
			W+29	+ Use USEPA Water Quality Scorecard to develop a systems approach to optimize stormwater	X										Y
			W+30	+ Establish a stormwater utility funding mechanism	X										Y
WATER	Policy	Enact policies to protect water resources	W31	Conduct a water rate study to determine sustainable rate structure	X							2021			
			W32	Adopt full-cost pricing policies for water service					X					Y	
			W33	Amend code to require water efficiency and conservation in commercial and residential development				X				2018 IRC		Y	
			W34	Incorporate conservation practices into new development guidelines and incentives				X							
			W35	Adopt a water conservation policy and/or plan inclusive of all customers and municipal operations	X										Y
			W35a	>Enact and enforce regulation to control of wasteful water practices	X										
			W35b	>Enact and enforce outdoor watering regulations responsive to drought conditions	X										Y
			W35c	>Regulate or incentive water efficiency for customers managing large landscapes						X					
			W36	Update stormwater ordinance to integrate Illinois State Model Local Stormwater Ordinance	X										Y
			W37	Adopt codes that enable rainwater harvesting for non-potable uses					X						
			W38	Adopt a resolution supporting the Great Lakes and St. Lawrence River Basin Water Resources Compact					X						
			W39	Review and adopt codes to eliminate barriers to green infrastructure BMPs including cisterns, green roofs, bioswales, permeable paving					X						
			W40	Allow flexibility (off-site management, payment-in-lieu) to allow developments to meet stormwater management requirements sustainably						X					
W41	Enact codes that protect surface and groundwater from runoff and contamination	X													
WATER	Stewardship	Practice stewardship of water resources	W42	Sustain supply of high-quality public water	X										
			W43	Ensure drinking and wastewater systems are operating efficiently	X										
			W44	Utilize treated effluent as a valuable water resource					X						
			W45	Participate in watershed planning and stewardship efforts	X									Y	
			W46	Implement municipal recommendations from watershed plan					X						
			W46	Allow public access and encourage stewardship of community waterways					X						
			W48	Support regional and statewide water supply planning and stewardship					X					Y	
			W49	Contribute local data on water supply, quality and operations to support state and regional stewardship	X									Y	
			W+50	+ Enact a water offset policy for water neutral community growth					X					Y	
WATER	Outreach	Engage the community	W51	Educate and support the community to conserve water	X								Y		
			W52	Educate the community on the value of clean and safe drinking water	X										
			W53	Promote tap water over bottled water	X									Y	
			W54	Educate the community on practices that reduce contamination of water resources	X									Y	
			W55	Support private well-owners in water quality monitoring and stewardship							X			Y	

Category	 GOAL	OBJECTIVE		Already achieved	In Progress	Planned for next 6 months	Planned for next 12-18 months	Interested in pursuing	Not planned	Not relevant	Contact Initials	Notes	Link to resource	
		> STRATEGY												
		+ ADVANCED STRATEGY												
Education and Community	Engage the community in water stewardship	W56	Educate customers about public water supply and wastewater operations through media and events		X									
		W57	Educate the community on benefits and practices of green infrastructure					X						Y
		W58	Educate and support the community in preparing for and managing floods		X									Y
		W59	Collaborate to teach water conservation and stewardship in schools					X						
		W60	Collaborate to raise watershed awareness and foster stewardship					X						

The member municipalities of the Metropolitan Mayors Caucus seek a vibrant, sustainable future for their communities and the greater Chicago region. The consensus goals of the Greenest Region Compact aim for enhanced quality of life for residents; protection and stewardship of the environment and sustainable economic

To become the most sustainable and successful region in the United States, they, therefore, support the following consensus goals of the Greenest Region Compact and agree to work to achieve them, both in their own communities and in collaboration throughout the region:



Climate

- Reduce greenhouse gas emissions
- Maintain clean and healthful air
- Develop resiliency to climate change impacts
- Engage the community in climate change mitigation and adaptation



Economic Development

- Promote innovation and a competitive workforce
- Cultivate local and sustainable development, jobs, and businesses



Energy

- Use energy for buildings and facilities efficiently
- Advance renewable energy
- Reduce energy consumption
- Enact policies that support clean energy
- Engage the community in clean energy practices



Land

- Encourage strategic development that upholds sustainability principles
- Conserve, restore and enhance natural features and ecosystems
- Support networks of accessible well-used and enjoyable parks
- Sustain a robust urban forest canopy
- Sustain beautiful landscapes that provide ecosystem services
- Achieve greater livability through sustainable land use and housing policies
- Cultivate a conservation ethic in the community



Leadership

- Enlist support for GRC2 goals through regional, state and national leadership
- Advocate for policies that align with and advance the GRC2
- Work collaboratively towards a sustainable region



Mobility

- Support safe and effective active transportation
- Maintain a diverse, safe, and efficient transportation network
- Support efficient transportation that uses resources wisely
- Integrate sustainability into transportation policies, programs, and regulations
- Promote public and sustainable transportation choices



Municipal Operations

- Lead by demonstrating sustainable values and practices
- Integrate sustainability into all municipal operations
- Operate a safe, clean and efficient fleet
- Collect and manage data to advance sustainability



Sustainable Communities

- Promote cultural vibrancy in the community
- Foster a culture of health, safety, and wellness
- Increase access to sustainably grown local food
- Sustain community principles that are welcoming, inclusive and equitable
- Promote a sustainable identity for the community
- Ensure local policies and codes support sustainability
- Cultivate community values based on principles of sustainability



Waste & Recycling

- Support sustainable material management
- Recycle materials across all sectors
- Divert waste from landfills
- Enact policies that cause sustainable material management
- Engage the community in waste reduction and recycling



Water

- Use and distribute water efficiently
- Protect and improve water quality
- Manage water system assets sustainably
- Optimize the use of natural and built systems to manage stormwater
- Practice stewardship of water resources
- Enact policies to protect water resources
- Engage the community in water stewardship

APPENDIX III

Carbon Emissions from Electricity Usage in Deerfield For 2017 (Scope 2)

Prepared: 1/23/2019 George McClintick

Input Parameters	(Inputs in blue font)	Sources
Carbon Dioxide Emissions	1243 lbs. CO2/mWh*	eGRID for 60015 Zip Code in 2016*
Nitrogen Oxides and Sulfur Dioxide are not included in calculations.		
Households in Deerfield	6,893	U.S.Census Bureau, 2013-2017
2017 cost/kWh	\$0.063	Citizens Utility Board, May 22, 2017

mWh = megawatt-hour
 kWh = kilowatt-hour

990.48lbs. ComEd Environmental Disclosure Report, June 30, 2017 (CO2 only)
 * 2016, total output emission rate. Used by Evanston
 eGrid is widely used for official CO2 emission inventories.
 eGrid includes transmission & distribution losses, hence higher values than ComEd Env. Disclosure Report
 Also, renewable power replaces coal at the margin and not the avg. emission amount.

Revenue Classes	Revenue Class Nm	Data in kWh										Data supplied from ComEd via Andrew Lichterman				
		201701	201702	201703	201704	201705	201706	201707	201708	201709	201710	201711	201712			
SUM(Billing Usage Qty)	SUM(Billing Usage Qty)	SUM(Billing Usage Qty)	SUM(Billing Usage Qty)	SUM(Billing Usage Qty)	SUM(Billing Usage Qty)	SUM(Billing Usage Qty)	SUM(Billing Usage Qty)	SUM(Billing Usage Qty)	SUM(Billing Usage Qty)	SUM(Billing Usage Qty)	SUM(Billing Usage Qty)	SUM(Billing Usage Qty)	SUM(Billing Usage Qty)	SUM(Billing Usage Qty)		
01	RESIDENTIAL	7,436,816	5,630,749	5,292,153	4,990,504	5,201,606	7,358,425	8,593,560	8,085,450	6,021,602	6,493,142	5,189,789	6,428,441			
03	SMALL COMM INDUST	11,529,958	10,006,637	9,521,146	8,957,876	8,904,709	9,800,421	10,533,119	10,509,188	9,087,865	9,469,233	8,931,263	10,802,981			
05	LARGE COMM INDUST	9,019,162	7,079,049	6,247,208	5,683,972	5,223,521	5,597,568	5,650,125	5,476,457	4,901,003	5,458,027	5,900,651	6,696,588			
06	STREET AND HIGHWAY LIGHT	172,485	153,859	145,233	138,076	125,639	126,160	125,795	120,050	122,634	127,346	135,701	148,169			
25	SMALL US GOVERNMENT	217,007	189,313	168,010	165,169	162,810	196,054	215,086	196,559	172,854	180,655	161,765	208,214			

CO2 Emissions for 2017

	kWh	mWh	pounds of CO2	Metric Tons of CO2	Percent	Metric tons CO2/ household/yr
Residential	76,722,237	76,722.24	95,365,741	43,250	28%	6.27
Small Commercial	118,054,396	118,054	146,741,614	66,549	43%	
Large Commercial	72,933,331	72,933	90,656,130	41,114	27%	
Street and Highway Light	1,641,147	1,641	2,039,946	925	1%	
Small US Governemnt	2,233,496	2,233	2,776,236	1,259	1%	
Total for Deerfield	271,584,607	271,585	337,579,667	153,097		
	131,960,529	1,131,602.53	4.166666667	192,010		Using national average for kWh conversion, from EPA Avert tool. Assumes marginal power plants.
	0.49	2,131.05				

Total Municipal Usage for 2017 (Street and Highway Light plus Small US Government)

3,874,643 kWh	
3,875 mWh	Cost per Illinois Wind REC \$0.80
4,816,181.25 pounds of CO2	Cost for 100% Village Green Electricity \$ 3,100
2,184 metric tons of CO2	

Residential Monthly Average Usage for 2017	All Classes Usage for 2017 (See table above for list of classes)
6,393,520 kwh/month	271,584,607 kWh
928 kwh/month/household	271,585 mWh
\$58.43 Average monthly bill	337,579,667 pounds of CO2
11,130 kwh/year/household	153,097 metric tons of CO2

Andrew Lichterman: "Small US Government" includes: Village operations, two school districts, Park District, Township and Fire Protection District. Schools Districts are probably the largest usage.

For ComEd Data: Small Commercial/Industrial are accounts with annual peak demand of 100KW or less.

For Municipal aggregation purposes: Small businesses are accounts with annual energy usage of 15,000 kWh or less.

Note: Page 60 of Evanston Aggregation RFP states that customers with peak demand of 100 kW or less are eligible for the aggregatin program. (email of Mar 6, 2019)

3,874,643 kWh	Residential Metric tons for Eight City Consortium
1000	439,211 tons/year
3874.643 kW approx. power required for Village	
\$ 4,986,945 Approx.total cost for residential energy 2017	
50,000 Energy Saveings under Aggregation 2.0	
1.00% Percent savings	

**Carbon Emissions from Natural Gas Usage in Deerfield
For 2017**

Input Parameter	Source
0.0053 Metric tons/therm <i>(Inputs in blue font)</i>	https://www.epa.gov/energy/greenhouse-gases-equivalencies-calculator-calculations-and-references US National weighted average.

	therms	Metric Tons CO2	Percent
Commercial	3,089,974.2	16,376.9	27.2%
Industrial	54.7	0.3	0.0%
Residential	8,265,687.6	43,808.1	72.8%
Total	11,355,716.5	60,185.3	

Metric tons CO2/household/year
6.355

Average therms/household/year
1199

**North Shore Gas Company
Gas Therms Usage Report for City of Deerfield**

1/1/2017 through 12/31/2017

Data only for corporate limits of Deerfield

Data Received from Andrew Lichterman Dec 18, 2018

	Retail	Transportation	Total Therms
Commercial	2,741,664.5	348,309.7	3,089,974.2
Industrial	54.7	0.0	54.7
Residential	7,858,841.6	406,846.0	8,265,687.6
Total	10,600,560.8	755,155.7	11,355,716.5

10,600,560.8 755,155.7 11,355,716.5

Transportation column refers to gas that is purchased through third party gas suppliers and transported through North Shore pipes.

Carbon Emissions from Vehicle Usage in Deerfield per year

Input Parameters (Inputs in blue font)	Source
0.00889 metric tons of CO2/gallon of gasoline	EPA/ Department of Transportation
22 weighted average combined fuel economy for cars and light trucks (miles/gallon)	Federal Highway Administration, 2016
16,425 average household miles traveled per year(VMT)	CMAP 2015 Travel Trends (See box to right)
6.64 metric tons of CO2/household/year	
6,893 number of households in Deerfield	U.S.Census Bureau, 2013-2017
For Entire Residential Community	
45,750 metric tons of CO2 /year	
747 Household gallons/year	
\$ 0.18 Federal gas tax/gal	
\$ 0.37 Illinois gas taxes/gal (on average)	
\$ 0.56 Total gas tax for Illinois drivers/gal	
\$ 416.00 Average Annual gas tax per household	\$ 40.00 Social cost per ton of CO2 (cost of economic impact)
\$ 265.49 Average Social Cost of Carbon footprint from gas usage	https://www.edf.org/true-cost-carbon-pollution
\$ 150.51 Difference	

Chicago Metropolitan Agency for Planning CMAP 2015 Travel Trends		
	Per Deerfield Household	Total for Deerfield
	Daily Miles	Annual Miles
Average miles driven (range):	40	14,600
	50	18,250
Average:	45	16,425
		113,217,525

Evanston uses CMAP regional data, "tempered" with local fuel sales.

0.998 ratio of CO2 emitted per gallon to total GHG emissions	Federal Highway Administration, 2016
--------------------------------------------------------------	--------------------------------------

Burning gasoline only produces CO2 and water. <https://slate.com/news-and-politics/2006/11/how-does-one-gallon-produce-19-pounds-of-carbon-dioxide.html>

Atmosphere composition:	Methane	CO2	
	0.000001867	0.000415	https://www.epa.gov/ghgemissions/understanding-global-warming-potentials#Learn%20why
	Parts per million	415	https://www.climate.gov/news-features/understanding-climate/climate-change-atmospheric-carbon-dioxide
	1.867	2018	CO2 highest in 3 million years

Sources of methane		
Fossil fuel production	0.33	https://whatsyourimpact.org/greenhouse-gases/methane-emissions
Livestock	0.27	https://phys.org/news/2019-03-methane-atmosphere-surginq-scientists.html
Landfills and waste	0.16	
Biomass burning	0.11	Not clear where the rapid increase in methane is coming from.
Rice agriculture	0.09	
Biofuels	0.04	
	1	
CH4 80 times more powerful in short term, than CO2		
Responsible for a quarter of global warming? (EDF)		

Food Scraps to Compost (1 ton scrap=.88 MTCO2)	Landfill Tons	% Organics	Organics Tons	MTCO2/ ton	
Plant Based Eating????	11456	0.25	2864	0.88	2,520

Lifecycle GHG Emissions for Food
 Source: ICLEI Community Protocol Version 1.2

SC.1.2 Food Emissions Factor

The life cycle EF for food is obtained from EIOLCA. The EF for food is estimated as 1.6 kg-CO2e/2002\$ for a typical US household diet. The following table shows some of the typical EF for food commonly reported by CES.

Table SC.1.1. Food EFs for various fEIOLCA GHG EF (kg-CO2e/2002\$)

Food at home

Cereals and bakery products	0.85
Meats, poultry, fish, and eggs	1.86
Dairy products	2.39
Fruits and vegetables	0.89
Other food at home	0.98

From: Hillman, T. (2008). Doctoral Dissertation.

SC.1.3 Sample Calculation

The annual expenditures for food at home for a community of 4,000 households is reported as \$3,200 /HH in 2002\$. The local government uses restaurant sales tax data to determine that total expenditures at restaurants by residents and visitors equated to \$10 million in 2002\$. The life cycle GHGs for food consumed by the whole community is computed as follows:

Life Cycle GHGs from food consumption at home = (\$3,200 /HH/yr)(4,000 HH)(1.6 kg-CO2e/2002\$)(1 mt/1,000 kg) = **20,480 mt-CO2e**
 Life Cycle GHGs from food consumption at restaurants = (\$10,000,000/yr)(0.25)(1.6 kg-CO2e/2002\$)(1 mt/1,000 kg) = **4,000 mt-CO2e.**

Per Household	5.12
Alt: use Restaurant Sales Tax receipts to calculate	1.00
	6.12

Life Cycle GHGs from total food consumption = (20,480 mt-CO2e) + (4,000 mt-CO2e) = **24,480 mt-CO2e**

Deerfield Calculation

Home MT/ HH	5.12
Restaurant MT/HH	1.00
Total Food Consumption MT/ HH	6.12

	Annual Expenditure	Total # Households	Total Drfld Rest. Sales Tax Receipts	% of Restaurant Tax Receipts pay for food	Emissions Factor	Emissions MT convert	Total MT / GHG's	Total per HH
Home	\$ 12,000	6,893			1.6	0.001	132,346	19
Restaurant			18,000,000	0.25	1.6	0.001	7,200	#DIV/0!
Total							139,546	#DIV/0!

Deerfield Total # HH's	6,893
Total Food Consumption MT/ HH	6.12
Total Food MT/ CO2 for Deerfield	42,185

Food spending as a share of income declines as income rises

Food spending and share of disposable income spent on food across U.S. households, 2019



Source: USDA, Economic Research Service using data from U.S. Bureau of Labor Statistics, Consumer Expenditure Survey, 2019.

Deerfield - REC BUDGET ALL SOURCES

CATEGORIES	MATH	VALUES	NOTES
Electric Consumption			
Residential (MMBTU, 2017)	A	181,000	SLOPE: State and Local Planning for Energy (NREL)
Commercial (MMBTU, 2017)	B	496,000	SLOPE: State and Local Planning for Energy (NREL)
Industrial (MMBTU, 2017)	C	213,000	SLOPE: State and Local Planning for Energy (NREL)
SUBTOTAL Electricity Consumption (MMBTU, 2017)	D=A+B+C	890,000	
Conversion Factor (MMBTU/MWh)	E	3.412	
SUBTOTAL Electricity Consumption (MWh, 2017)	F=D/E	260,844	
Offsets			
Total Electricity Consumption (MWh, 2017)	G=F	260,844	
ComEd Supply from Carbon-Based Resources (6/20-6/21)	H	60.0%	ComEd Environmental Disclosure
Total Electricity Consumption from Carbon-Based Resources (MWh)	I=G*H	156,506	
ComEd REC Procurement (%)	J	7.5%	IPA RPS Funding and Budget Update (12/28/2020)
SUBTOTAL Net Electricity Consumption to be Offset (MWh, 2017)	K=I*(1-J)	144,821	
Costs			
Net Electricity Consumption to be Offset (MWh, 2017)	L=K	144,821	
Number of RECs required	M=L	144,821	
Average cost of RECs	N	\$3.00	ICAP Energy LLC, REC Brokering Sheet (Michigan RECs)
Cost to achieve 100% Renewables	O=M*N	\$434,462	
- Contribution from Municipal Aggregation	P	\$60,000	
= Remainder Budget to achieve 100% Renewables	Q=O-P	\$374,462	

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