

Bright Climate Future 2035

Planning for a Low-Emissions, Prepared, and Engaged Village of River Forest

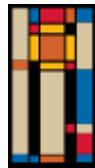
Spring 2024

Bright Climate Future 2035:

Planning for a Low-Emissions, Prepared, and Engaged
Village of River Forest

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Executive Summary

Rapid cuts in GHG emissions and swift actions for climate adaptation are imperative to avoid detrimental loss of life, biodiversity, and infrastructure in River Forest and beyond.

The Intergovernmental Panel on Climate Change (IPCC) issued an urgent call to action following the release of their report on Impacts, Adaptation and Vulnerability in February 2022. The IPCC report highlights the challenge of climate resilience development under existing warming projections of 1.5°C (2.7°F). The report warns that surpassing the 2°C (3.6°F) threshold will render such efforts impossible in some regions across the world.¹

Creating the Sustainability Commission in 2017 was the first step in the Village addressing the impacts of climate change. In June 2022, Cathy Adduci, River Forest Village President, demonstrated the priorities of the community by joining the Cross-Community Climate Collaborative (C4). The Village further demonstrated climate related commitments by joining the Metropolitan Mayors Caucus (MMC), a membership organization in the Chicago region that set a goal of reaching a 65% reduction in emissions from a 2005 baseline by 2040. This aligns the goals of participating municipalities toward the target of achieving a 100% reduction in GHG emissions by 2050.²

River Forest has consistently made commitments to reducing greenhouse gas emissions via partnerships like the Cross-Community Climate Collaborative (C4) and the Metropolitan Mayor's Caucus. This commitment of emissions reduction is imperative for advancing collective global efforts against climate change.

Future impacts on River Forest remain uncertain, yet the inevitability of further climate change is clear. River Forest has a unique opportunity to lead the Chicago region to take bold action within a rapidly narrowing timeframe to ensure a livable and prosperous community for future generations.

THIS PLAN RESPONDS TO THE CLIMATE CRISIS

River Forest boasts an extensive single-family housing stock, a dense canopy coverage with a high-quality floodplain forest, multimodal transportation options, and most importantly, a motivated community. With these assets, River Forest has the potential to prepare for the uncertainty ahead. River Forest will accomplish this by addressing emissions reduction and preparedness with strategies that center on buildings and energy, transportation, infrastructure resilience, and community engagement.

BUILDINGS & ENERGY

The Village prides itself on its quality housing and unique, historic aesthetic. However, as the climate crisis escalates, it becomes imperative to address the impact of built structures on greenhouse gases (GHG). Residential emissions are the primary contributor to GHG emissions within the municipality, necessitating urgent action from both residents and local authorities. To combat this, the *Bright Climate Future 2035* plan targets residential building emissions, aligning with the findings



Source: Austin Busch

¹ Intergovernmental Panel on Climate Change. (2022, February 28). Retrieved from <https://www.ipcc.ch/2022/02/28/pr-wgii-ar6/>

² Metropolitan Mayors Caucus. (2021). Climate Action Plan for the Chicago Region 2021. Retrieved from <https://mayorscaucus.org/wp-content/uploads/2021/12/Climate-Action-Plan-For-the-Chicago-Region-2021-by-MMC-NOAA.pdf>

from the Chicago Metropolitan Agency for Planning (CMAP), showing River Forest's higher per capita residential energy consumption compared to neighboring areas. These strategies focus on decreasing residential energy consumption and electrifying homes, while also encouraging non-residential buildings to prioritize energy efficiency. Benchmarking utilities usage will offer the ability to see the progress of the initiatives taken.

TRANSPORTATION

This plan proposes initiatives to transform River Forest into a sustainable, accessible, and equitable transportation hub. This involves converting roadways into Complete Streets to make room for pedestrians, cyclists, and public transportation, installing more bike facilities, and expanding electric vehicle (EV) charging infrastructure. These transportation actions leverage River Forest's existing transit services and walkable infrastructure, while aiming to increase alternative modes of transportation, enhance connectivity, and establish an abundant EV charging network.

RESILIENCE

In anticipation of climate-related challenges that are likely to be experienced in the Midwest such as intensified heatwaves and flooding, this plan advocates for proactive adaptation strategies. River Forest can reduce the risk of property damage and strengthen community resilience by investing in green infrastructure and preserving natural ecosystems. This plan aims to identify upgrades to infrastructure to be resilient to new environmental risks resulting from a global temperature increase of 2 degrees celsius to making River Forest an adaptable and prepared village.

COMMUNITY ENGAGEMENT

Central to the success of this plan is community engagement and outreach. This plan aims to involve a diverse network of stakeholders, including residents, businesses, institutions, and nonprofits. By focusing efforts on awareness and participation, the plan ensures broad support for climate initiatives and aligns its strategies with the values and aspirations of the River Forest community. In this era of climate crisis, the importance of community involvement is imperative as meaningful change often begins at the grassroots level. This plan calls to empower each community member to take ownership of their current and future practices regarding environmental stewardship and climate change mitigation to be an engaged and informed village.

Collectively working towards a bright climate future reminds us that we are not powerless in the face of looming environmental threats, and that we can all be active agents of change.

Bright Climate Future 2035's recommended actions:

Weatherization: Implement measures to reduce energy consumption in buildings.

Electrification: Transition HVAC systems and appliances to lower-emitting electric sources.

On-site Electricity Generation: Harness clean, local energy to power electric systems.

Energy Usage Optimization: Implement benchmarking to monitor progress and enhance efficiency.

Accommodate All Users: Road conversions and implementation of Complete Streets Initiative.

Promote Cycling: Ensure adequate and secure bike parking facilities are available/strategically placed throughout the Village.

Public EV Charging: Invest in public EV charging stations in River Forest

EV Development Standards: Mandate electric vehicle charging infrastructure in multi-family and commercial developments

Tree Protection: Promote community protection of the Village's trees.

Soil Health: Prioritize soil health to enhance carbon capture.

Stormwater Management: Protecting roads and sidewalks from extreme temperatures and weather events.

Biodiversity: Enhance ecosystem connectivity and biodiversity throughout the Village.

Climate Data: Measure and monitor climate data with a centralized and accessible database.

Community Empowerment: Educate and empower residents in an equitable manner to take action within their own lives towards climate mitigation, resilience, and adaptation.

Collaboration: Build new and foster existing partnerships with key stakeholders inside the Village and neighboring communities through cross-community collaboration.

This climate action plan provides a roadmap for River Forest to address the complex impacts of climate change. *Bright Climate Future 2035* builds upon the current commitments of the community and urges further ambitious actions. At the center of this is nurturing a collaborative culture of change among Village government, residents, and partnering stakeholders.

The achievement of this plan's goals are contingent on multiple factors both within and outside the control of the Village and its residents. Local adoption rates of individual-based actions will affect the Village's overall emissions reduction. External factors, in particular the reduction in overall emissions from the local electric grid, will also significantly impact the effectiveness of the recommended actions. As with the global push to address climate change, individual actions are both necessary to accomplish this goal, but are insufficient in themselves without greater public and private collective action. This moment requires all Village leaders and residents to do their part to produce the future *Bright Climate Future 2035* imagines.³



Source: Austin Busch

³ Village of River Forest, Community Profile, 2024 https://www.vrf.us/guides/guide/2?utm_source=%2fgovernment%2fabout-river-forest&utm_medium=web&utm_campaign=redirect

VISION

By the year 2035, River Forest will significantly reduce greenhouse gas emissions and adopt resilient policies and practices, leading the Chicago region on climate initiatives.

The community will accomplish this through protecting the Village's natural resources, preparing for the impacts of climate change, and working toward becoming a net-zero community, thus ensuring a resilient and prosperous future for our residents and future generations.



Goals

Considering River Forest's current trajectory, *Bright Climate Future 2035* imagines three climate futures for the Village, beyond a business-as-usual approach. These future outcomes are not mutually exclusive, and are intended to be reached in tandem. Each individual future outcome is expressed in a goal, which guides the actions recommended in *Bright Climate Future 2035*.



THE LOW-EMISSIONS VILLAGE

Future outcomes:

- Delay or avoid the worst consequences of extreme climate change
- Become a model community for future transformation
- Enjoy cost savings from increased efficiency



Goal:

65% reduction in localized greenhouse gas emissions from a 2007 baseline within 10 years.



THE ADAPTABLE & PREPARED VILLAGE

Future outcomes:

- Reduce risk of expensive property damage and health outcomes
- Protect and improve natural ecosystems
- Prevent declining property values



Goal:

Upgrade infrastructure to be resilient to new environmental risks resulting from a global temperature increase of 2 degrees celsius.



THE ENGAGED & INFORMED VILLAGE

Future outcomes:

- Increase community buy-in
- Participation is inclusive of diverse voices from across the community
- Community feels secure and prepared for the future ahead



Goal:

Empower each community member to take ownership of the actions and results of their current and future practices regarding environmental stewardship and climate change mitigation.

Evaluation Criteria

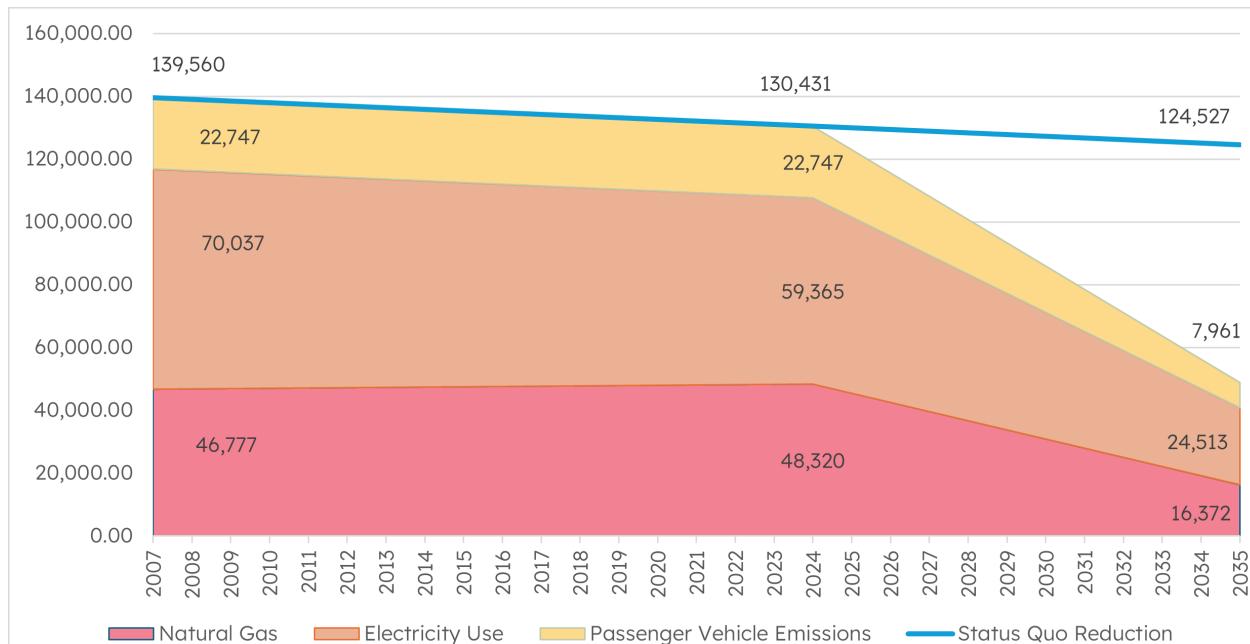
The village expressed the need for high-impact, cost-efficient actions that can be quickly and easily implemented, working within the village's constrained resources and abilities (for example, a lack of home rule meant raising taxes to pay for new initiatives or disincentivize unsustainable practices was not feasible). Following this guidance and priorities, *Bright Climate Future 2035*'s planning team developed the following criteria to identify and evaluate several pathways and select a final set of climate actions:

CRITERIA	SYMOLOGY & RATIONALE
IMPACT	 Goal: THE LOW-EMISSIONS VILLAGE <ul style="list-style-type: none"> Measured in GHG emissions reduction potential, quantified in mtCO₂e when possible.
	 Goal: THE ADAPTABLE & PREPARED VILLAGE <ul style="list-style-type: none"> Low: Improvements in resilience are indirect. Medium: Effects are adjacent or secondary to preparing the village for climate change threats. High: Directly impactful in preparing the village for climate change threats.
	 Goal: THE ENGAGED & INFORMED VILLAGE <ul style="list-style-type: none"> Low: Improvements to community engagement are not direct. Medium: Effects are adjacent or secondary. High: Directly impactful in creating a village that's engaged in fighting climate change and preparing for its threats.
ADMINISTRATIVE BURDEN	<p>The amount of staff resources needed to adopt and implement, facilitate or operate the action. The team considered whether new municipal staff positions or entire departments would need to be created within the River Forest government, and how much staff time may be necessary.</p>
	Easily able to implement with existing staff capacity and structure.
	Requires some added administrative capacity, staff, training, equipment, services, etc., temporarily during the planning and implementation process.
	Involves wholly new government functions, administrative or operational capabilities, laws/ordinances, taxing authorization/referendum, etc.
COST	<p>The annual and total cost of the proposed action to the Village of River Forest and/or its residents:</p>
\$	Little to no new capital spending; costs are limited to staff time, materials, and planning, and/or are the responsibility of parties other than the village or individual residents.
\$\$	New capital spending is limited to moderate relative to current municipal budget.
\$\$\$	Large amounts of new capital spending necessary, with new revenue sources or outside funding likely needed.
IMPLEMENTATION TIME	<p>How quickly the proposed action can be prepared and implemented, estimated in months or years.</p>

Greenhouse Gas Emissions

The climate change mitigation sections of this plan recommend actions which work towards The Low-Emissions Village goal of a 65% reduction in River Forest's GHG emissions from 2007. The aggressive mitigation timeline was created for River Forest to mirror the interim reduction goal of 65% by 2040 of 2005 GHG levels, set by the Metropolitan Mayors Caucus.² The Village has already opted in to this plan and as a regional leader can enact a Climate Action Plan to meet this essential goal. River Forest GHG inventory calculated 2007 numbers for transportation, natural gas, and electricity usage, as well as 2019 baseline numbers were available and used in Figure 11.

Figure 11: Reduction Target vs. Status Quo^{7,18}



Source: CMAP & River Forest

Natural gas and electricity use are the main building and housing GHG emission contributors. River Forest needs to reduce emissions from these sources from just over 107,000 metric tons of carbon dioxide equivalent in 2024 to 40,884 metric tons of carbon dioxide equivalent by 2035. Solar energy, air-source, and water heater heat pumps are the most comprehensive energy reducing tactics, therefore we place heavier emphasis on implementing these home modifications.

Transportation related actions use the potential reduction in vehicle miles traveled given policies might induce, in conjunction with the goal of increasing the portion of River Forest resident's cars on the road which are electric to 15% by 2035, to estimate reductions in mtCO₂e.

GHG reductions for many building actions come from a variety of sources and it is difficult to precisely quantify the impact of each action on the Village's emission. This is why benchmarking buildings to get clearer data on the impact of individual actions is also a facet of this plan. See appendix for full calculations of GHG reduction estimates.

► Quantifying Emissions Using mtCO₂e

Climate change is caused primarily by human activities, namely those which emit specific gasses which have greenhouse effects of trapping heat in the atmosphere. Metric tons of carbon dioxide equivalent (mtCO₂e) is used to approximate the impacts of the energy and transportation actions in this plan. The unit represents an amount of a GHG whose atmospheric impact has been standardized to that of one metric ton of carbon dioxide (CO₂), based on the global warming potential of the gas. This equivalency provides a standardized unit to compare the efficacy of different types of interventions in their effort to mitigate climate change.

¹⁸ Village of River Forest Greenhouse Gas Inventory, 2019, Courtesy of Village of River Forest staff.

1 BUILDINGS & ENERGY

The most impactful way to become the low-emissions village is to target residential and non-residential emissions. The average River Forest resident⁷ uses 60 MMBTU* of natural gas per year, compared to the average Oak Park resident who uses 41 MMBTU. The proposed strategies target the ways in which the average River Forest resident can improve their home's efficiency and resilience, as well as ways the Village can improve its public buildings and ensure that non-residential buildings are more efficient.

The goal of 65% reduction in GHG emissions for the Village can be largely accomplished by individual and municipal actions that target the emissions of residential and non-residential buildings.

This plan recommends the following approaches:

1.1 Weatherization of structures to reduce the energy consumption of buildings within the Village.

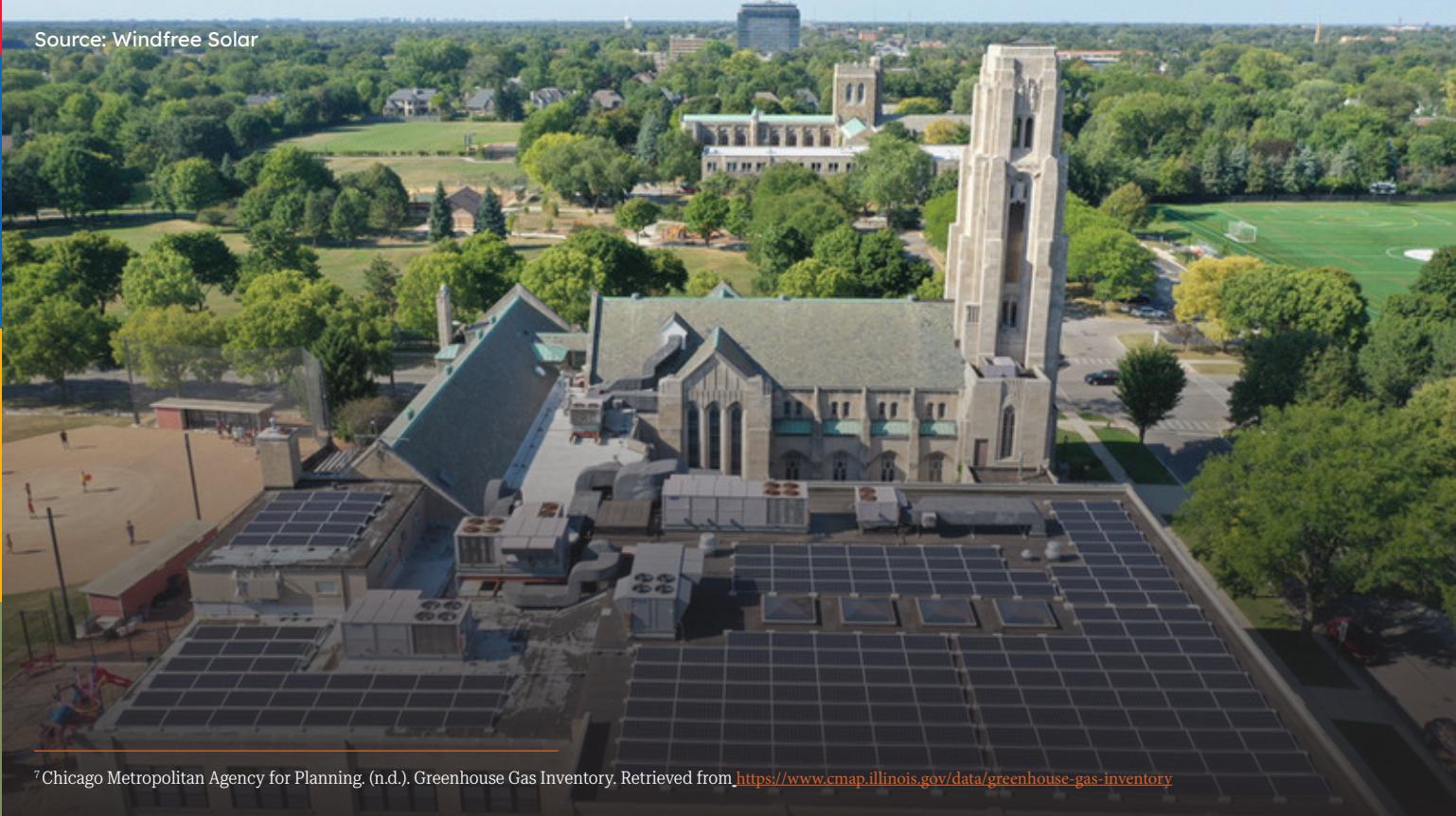
1.2 Electrification of HVAC systems and appliances to switch energy consumption to less-emitting electric fuel sources.

1.3 Generation of electricity on-site to power electric systems with clean, local energy.

1.4 Optimization of energy usage via benchmarking to monitor progress and implementation.

► *BTU (British Thermal Unit) is the quantity of energy required from heating sources to raise the temperature of 1 pound of water by 1 degree Fahrenheit. MMBTU is a Metric Million British Thermal Unit.

Source: Windfree Solar



⁷Chicago Metropolitan Agency for Planning. (n.d.). Greenhouse Gas Inventory. Retrieved from <https://www.cmap.illinois.gov/data/greenhouse-gas-inventory>

ACTION

1.1 Weatherization: Reduce Energy Consumption by Retrofitting Buildings To Be Insulated from External Temperatures

The Low-Emissions Village | The Adaptable & Prepared Village | The Engaged & Informed Village

WHY

River Forest's current built environment consists largely of older, detached houses that were originally constructed before modern standards for building insulation. Weatherization retrofits can reduce the cost to heat and cool these houses, as well as lower the associated GHG emissions produced. While some retrofitting of houses has likely occurred already, it is unclear to what extent this has occurred, and how effective these retrofits have been in increasing building performance. The proposed sub-actions address immediate diagnostics and upgrades for existing houses, as well as long-term updates to the Village's building code for replacement projects.

WHAT

1.1.1 Develop in-person and online community education programs on a recurring basis to teach residents how to prepare houses for seasonal efficiency upgrades.

1.1.2 Develop a community hub for easy access to acquire materials and borrow equipment required to implement seasonal upgrades.

1.1.3 Update building codes to efficiency metrics at or above recommended standards for the [IECC Climate Zone 5](#)¹⁹, and require permitted home improvement projects to meet these metrics.

1.1.4 Encourage new multi-family home development within the Village to increase residential density in more efficient housing.

HOW

- Encourage the use of smart thermostats in all housing units, including adopting municipal requirements for their installation in rental properties.
- Encourage the use of LED lighting for all fixtures, including adopting municipal requirements for their use in commercial properties.
- Develop a public education program covering seasonal weatherization for homeowners, in partnership with the library, historical society, and other community institutions.
 - The program should include online and annual in-person instruction.
 - For winter preparation, weather sealing and stripping techniques should be demonstrated. For summer, window film, reflective curtains, and airflow should be emphasized.

- Additional gardening programs about ivy, trellis, and tree maintenance should also be developed in partnership with local community organizations.
- In partnership with the local library, enable DIY diagnostics via a tool lending library for home efficiency detection, including thermal leak detectors, thermal imaging cameras, and plug-in power meters.
- Consider co-locating a centralized distribution and training hub for window sealing tape, window insulation film, and weather stripping for all residents each fall.
- Adopt building codes that require new roofs and roofing replacement projects to utilize [“Cool Roof” materials](#)²⁰ to reflect unwanted heat, including green roofs, reflective paint, or brighter colors.
- Adopt building codes requiring new construction and extensive retrofitting projects to meet insulation standards as appropriate for [IECC Climate Zone 5](#):
 - Attic: R60 or higher
 - Wall cavities: R13 or higher
 - Floor: R30 or higher
- Adopt building codes that require new windows and window replacements have a U-value of 0.3 or lower, and a SHGC-value of 0.35 or lower, for [Energy Star’s Northern Climate Zone](#).²¹
- Encourage [“passive building” principles](#)²² to be incorporated into new structures and extensive retrofitting projects, with specific metrics for airtightness to be inspected with a [blower door test](#).²³

¹⁹ International Code Council. (2021). Chapter 3: General Requirements. Retrieved from <https://codes.iccsafe.org/content/IECC2021P2/chapter-3-ce-general-requirements>

²⁰ U.S. Department of Energy. (n.d.). Cool Roofs. Retrieved from <https://www.energy.gov/energysaver/cool-roofs>

²¹ U.S. Department of Energy. (n.d.). Energy-Efficient Window Coverings. Retrieved from <https://www.energy.gov/energysaver/energy-efficient-window-coverings>

²² Passive House Institute US. (n.d.). Passive Building Principles. Retrieved from <https://www.phius.org/passive-building/what-passive-building/passive-building-principles>

²³ U.S. Department of Energy. (n.d.). Blower Door Tests. Retrieved from <https://www.energy.gov/energysaver/blower-door-tests>

ACTIONS	IMPACT	ADMIN. BURDEN	COST	IMPLEMENTATION TIME
1.1.1 - 1.1.2	 10% reduction in GHG emissions associated with energy use		\$	1 YEAR
1.1.3	 10% reduction in GHG emissions associated with energy use		\$\$	2 YEARS
1.1.4	 No total reduction in GHG emissions, but reduction in per capita GHG emissions		\$	2 YEARS

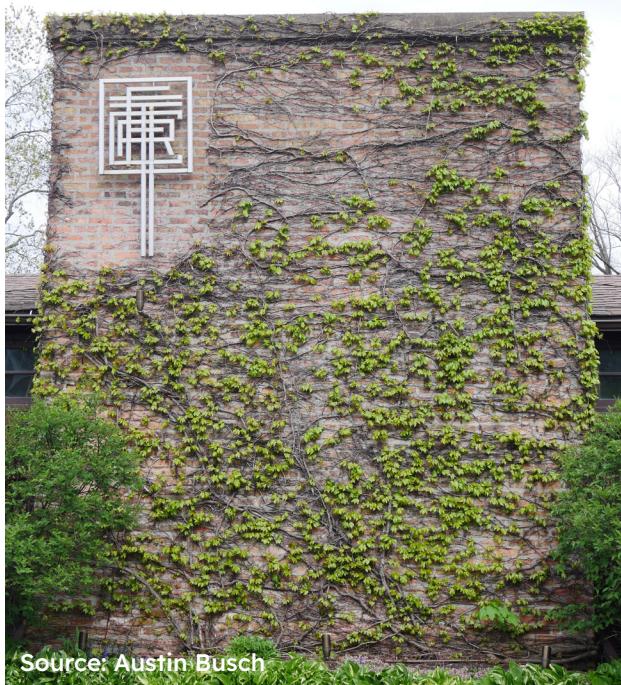


Figure 12: An Example of Green Facade at the River Forest Tennis Club.

► **Green facades** with climbing plants are a simple way to lower summer heating demand.

For homeowners to reduce GHG emissions from heating systems

1. Adopt a cost-effective hybrid heating system:

- a. Install and use air-source heat pumps in River Forest homes, supplementing the need for natural gas furnaces during extremely cold nights.
- b. Install and use either an indirect circulation solar water heater system or a passive thermosyphon system to supplement gas water heaters, a solar water heating option that is resilient to the Midwest climate.²⁴

2. Go completely electric:

- a. Install and use air-source heat pumps in River Forest homes, replacing the need for both natural gas furnaces and air conditioning units.
- b. Install and use heat pump water heaters in River Forest homes, replacing gas water heaters and reducing water-heating emissions by approximately 54% over 15 years.²⁵
- c. Fully eliminate the need for a natural gas line by replacing gas dryers with electric dryers and gas stoves with induction ranges.

²⁴ U.S. Department of Energy. (n.d.). Solar Water Heaters. Retrieved from <https://www.energy.gov/energysaver/solar-water-heaters>

²⁵ Tan, Lacey and Teener, Jack. Rocky Mountain Institute. (2023). Now Is the Time to Go All-In on Heat Pumps. Rocky Mountain Institute. <https://rmi.org/now-is-the-time-to-go-all-in-on-heat-pumps/>

ACTION

1.2 Electrification: Enable widespread shift to electric appliances in residences

The Low-Emissions Village

WHY

Home electrification is a crucial piece of River Forest's mitigation strategy, since residential natural gas and electricity use are significant contributors to overall emissions. River Forest's natural gas and electricity use are 45% and 25% higher²⁶ than the Cook County average respectively. Because regulating home temperature is the largest use of natural gas and electricity, replacing or supplementing natural gas furnaces with heat pumps is at the heart of this objective. Installing heat pumps will reduce space heating emissions by approximately 16% in the first year and 51% over 15 years per home²⁶, based on Illinois averages. Heat pumps are not only suitable for warmer climates but have now outsold furnaces nationwide since 2022. Additionally, green retrofitting and replacement projects are worthy financial investments, saving homeowners money.²⁷

WHAT

1.1.1 Develop in-person and online community education programs on a recurring basis to teach residents how to prepare houses for seasonal efficiency upgrades.

1.2.1 Subsidize energy assessments for River Forest homes to determine the best customized alternative for energy use.

1.2.2 Reduce financial burdens for heat pump installations.

1.2.3 Educate homeowners on the substantial cost-saving and environmental benefits of installing and using electric temperature regulating appliances.

1.2.4 Adopt building codes, which require new buildings to use fully electric appliances and have the capacity for EV charging stations.²⁹

1.2.5 Review building codes for non-residential buildings to encourage efficient large-scale HVAC systems and natural CO2 refrigerant systems.

HOW

- Encourage residents to align adoption of air-source heat pumps with the end life cycle of gas furnaces, typically around 15 years.
- Promote cost-free residential energy changes like adjusting the default gas water heating settings to only heat up to 120 degrees, eliminating the most intense heating situations.
- Model building code legislation in line with Oak Park's recently updated codes³⁰ requiring new construction utilize solely-electric energy sources.
- Require geothermal HVAC system feasibility study whenever large commercial and institutional construction projects are permitted.
- Survey and encourage replacement of F-gas refrigerant systems in supermarkets and non-residential kitchens.

Example: In a house in Toronto built in 1940²⁸ using a standard heat pump with a gas backup, gas and electricity bills cost 6% less, while the house produces a whopping 42% less GHG emissions.

ACTIONS	IMPACT	ADMIN. BURDEN	COST	IMPLEMENTATION TIME
1.2.1 - 1.2.5	 13-31% reduction ³¹ in each residence's GHG emissions with each heat pump installation		\$\$\$	2 YEARS to implement policies, adoption of HVAC conversion ongoing

²⁶ River Forest GHG Emissions Summary. (2019). [PDF file]. Retrieved from <https://www.cmap.illinois.gov/documents/10180/1483671/River+Forest+GHG+Emissions+Summary.pdf/db3125c9-8b42-f265-44a3-a82170b13279?t=1664310907120>

²⁷ Tan, Lacey and Teener, Jack. Rocky Mountain Institute. (2023). Now Is the Time to Go All-In on Heat Pumps. Rocky Mountain Institute. <https://rmi.org/now-is-the-time-to-go-all-in-on-heat-pumps/>

²⁸ Canadian Climate Institute. Heat Pump Calculator. (n.d.). Retrieved from https://heatpumpcalculator.ca/results/?&city=Toronto&building=single&building_year=1940&financing=false

²⁹ International Code Council. (n.d.). Current approaches to EV-integrated codes. Retrieved from <https://codes.iccsafe.org/content/ICCEVBCSGGR2021P1/current-approaches-to-ev-integrated-codes>

³⁰ American Legal Publishing Corporation. (n.d.). Oak Park, IL Code of Ordinances. Retrieved from https://codelibrary.amlegal.com/codes/oakparkil/latest/oakpark_il/0-0-0-3138

³¹ Theresa Pistochini, Mitchal Dichter, Subhrajit Chakraborty, Nelson Dichter, Aref Aboud,

Greenhouse gas emission forecasts for electrification of space heating in residential homes in the US, Energy Policy, Volume 163, 2022, 112813, ISSN 0301-4215, <https://doi.org/10.1016/j.enpol.2022.112813> (<https://www.sciencedirect.com/science/article/pii/S0301421522000386>)

ACTION

1.3 Generation: Generate and Store Electricity from Renewable Sources On-Site

The Low-Emissions Village

WHY

Renewable energy resources, such as solar, reduce GHG emissions by replacing fossil fuels. By supporting local solar installations on residential, commercial, and public buildings throughout the Village, transmission losses can be minimized and energy production can offset peak daytime demand. This is a significant opportunity for River Forest, since 76% of buildings are solar-viable.³² Additionally, peak time periods of energy usage are a more emissions-heavy fuel source mix, as natural gas plants turn on to meet peak demand. The implementation of residential battery storage systems can capture energy from renewable or lower-emission sources and utilize it during peak times, minimizing demand for new transmission infrastructure or peak production facilities.

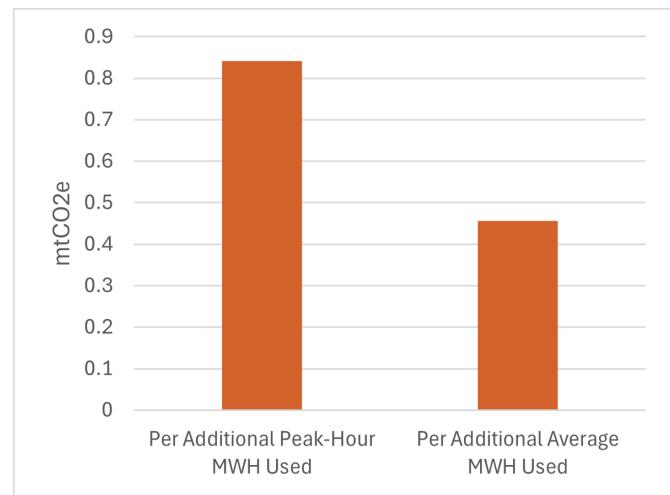
WHAT

- 1.3.1** Reduce permitting and financing burdens for solar installations.
- 1.3.2** Work with commercial and non-residential building owners to identify spaces and financing options for solar installations.
- 1.3.3** Create a resource hub for local best practices in battery and solar installations.
- 1.3.4** Encourage hourly pricing plans for electric utilities.

HOW

- Remove permitting fees for solar and battery system installations.
- Adopt building codes³³ requiring all new construction to have solar-ready roof zones.
- Use satellite imagery analysis to identify potential solar installation sites, and mail informational materials about construction and financing to addresses.
- Work with library and community partners to host in-person learning sessions about the benefits and implementation of solar and battery installations.
- Develop a preferred-contractor program that streamlines permitting, installation, and inspection for known local installers.
- Negotiate contracts for municipal electric aggregation programs to incentivize hourly pricing schemes for residential customers.

Figure 13: Emissions per additional MWH in RFCW eGrid Subregion (2022).³⁶



ACTIONS	IMPACT	ADMIN. BURDEN	COST	IMPLEMENTATION TIME
1.3.1 - 1.3.3	Cloud icon: 0.29 mtCO ₂ e per individual panel installed ³⁴	📋📋	\$\$	1 YEAR ongoing
1.3.4	Cloud icon: 0.352 mtCO ₂ e per household adoption ³⁵	📋	Negligible	SEPTEMBER 2024

³² Google. (n.d.). Project Sunroof: Data Explorer. Retrieved from <https://sunroof.withgoogle.com/data-explorer/place/ChIJjdxFYk1DogRj27vOd0To8/>

³³ International Code Council. (2021). Appendix CB: Solar-Ready Zone (Commercial). Retrieved from <https://codes.iccsafe.org/content/IECC2021P1/appendix-cb-solar-ready-zone-commercial>

³⁴ CMAP, & Metropolitan Mayors Caucus. (2024). Chicago Metropolitan Statistical Area Priority Climate Action Plan (p. 64). <https://www.epa.gov/system/files/documents/2024-03/chicago-msa-pcap.pdf>

³⁵ Elevate Energy. (2023). Commonwealth Edison Company's Hourly Pricing, 2022 Annual Report. Illinois Commerce Commission. <https://icc.illinois.gov/downloads/public/edock-et/587138.PDF>

³⁶ US EPA. (2024, February 26). eGRID Data Explorer. US EPA. Retrieved from <https://www.epa.gov/agrid/data-explorer>

ACTION

1.4 Optimization: Optimize Existing Energy Usage With Benchmarking

The Low-Emissions Village

WHY

To effectively address the root of River Forest emissions, it is important to understand where it's coming from to inform where to intervene. Cook County's energy grid has experienced little change in the past hundred years³⁷, modernization efforts are currently underway.³⁸ River Forest is able to track emissions reduction progress made by benchmarking utilities usage, a program that has been taken by governments serious about meeting reduction goals. The aggregated data allows policy makers a clear picture where the most crucial interventions can be taken. Tracking energy and water usage can foster better practices and can encourage better performance going forward.

WHAT

1.4.1 Mandate benchmarking of energy and/or water usage across Village for non-residential structures.

► **Municipal Benchmarking** is the process of executing an on-going data collection of emissions and utilities usage by non-residential buildings within a municipality, with the goal of reducing GHG emissions.

► **Energy Use Intensity (EUI)** is measured by kilo British thermal units per square foot per year (kBtu/sqft/year). It is the total energy consumed by a building in a year. Similar to miles per gallon, EUI is an indicator of a building's energy performance.

HOW

- Examine model programs from the region, including Cook County, Chicago, and Evanston.
- Create a municipal ordinance requiring energy benchmarking and reporting standards for all non-residential buildings.
- Use collected aggregate data to analyze usage trends and outliers to reduce emissions, and communicate this to building owners.
- Introduce building performance standards based on benchmarked analysis.
- Program would be on-going; operators would send in a timely report to the online program manager which can be made public.

ACTIONS	IMPACT	ADMIN. BURDEN	COST	IMPLEMENTATION TIME
1.4.1	 3-8% reduction ³⁹ in emissions associated with energy use in adopted buildings		\$	6 - 12 MONTHS

³⁷ Cook County, Illinois. (2017). Cook County Smart Grid FAQs. Retrieved from <https://www.cookcountylil.gov/sites/g/files/ywwepo161/files/service/cook-county-smart-grid-faqs-2017.pdf>

³⁸ ComEd. (n.d.). Smart Grid. Retrieved from <https://www.comed.com/smart-energy/smart-grid-smart-meter/smart-grid>

³⁹ Mims, N., Schiller, S. R., Stuart, E., Schwartz, L., Kramer, C., & Faesy, R. (2017, April 28). Evaluation of U.S. Building Energy Benchmarking and Transparency Programs: Attributes, Impacts, and Best Practices. Energy Analysis and Environmental Impacts Division, Lawrence Berkeley National Laboratory. <https://emp.lbl.gov/publications/evaluation-us-building-energy>

Aspects of a home retrofit for reducing GHG emissions



Photo Credit: Roland Tanglao, Wikimedia

Solar Panels

Rooftop Solar installations produce electricity locally, reducing household energy costs by offsetting consumption of power from the grid.



Photo Credit:
jimchou, Flickr

Green Facade

South-facing facades can see reduced solar heat gain through vegetative cover, such as ivy coverage on walls or a trellis, or nearby tree cover.



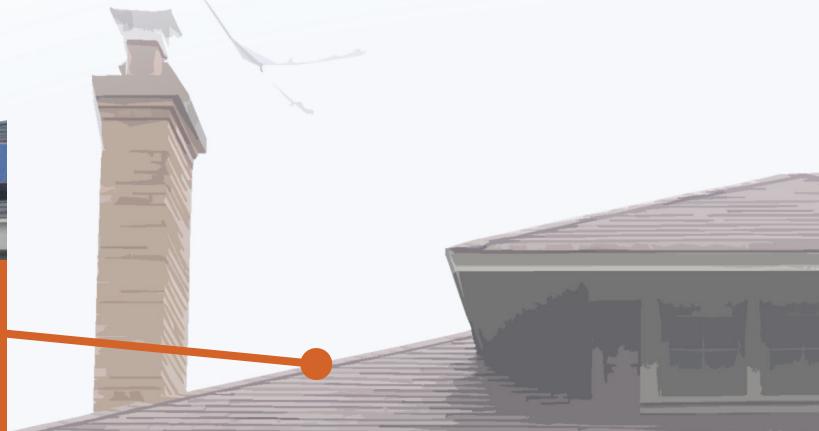
Photo Credit:
Wikideas1, Wikimedia

Heat Pump

Extracts heat from inside your home in summer and from outside your home in winter, a more energy efficient HVAC system.

Heat Pump Water Heater

Uses electricity to transfer heat to the water tank, providing hot water.



Battery Storage

A large battery for household energy storage can be charged during lower-cost, lower-emission off-peak energy hours, and used during peak periods.



Key Buildings & Energy Takeaways

This plan's building and energy actions will reduce GHG emissions through a synergized approach. By reducing home energy consumption, switching energy consumption to electric sources, producing electricity locally, and using benchmarking data to track improvements, River Forest can become a low-emissions village. Homeowners are the focal point of these strategies.

The effectiveness of the plan's emissions reductions will still depend on larger regional improvements in the GHG emissions associated with electricity production. Through the Climate and Equitable Jobs Act (CEJA), Illinois is taking statewide action to develop a fully clean electric grid. With the electrification and efficiency upgrades recommended in this plan, River Forest can position itself to wholly benefit from these electric grid improvements.

The Village should continue to improve its community education on the environmental and cost saving benefits of home weatherization and electrification (**1.1-1.2**). The first steps of improving home efficiency begin with a home energy assessment, which should be encouraged through

subsidizing and providing the relevant resources to residents and businesses. Wherever possible, the Village should limit any administrative barriers to the transition to electric, as well as those that limit the potential for on-site energy generation and storage (**1.3**). The local electric grid is in the process of modernization, making energy and water usage data readily available for residents to view their progress while taking steps to reduce their household consumption. Additionally, this plan recommends that the Village begin benchmarking utilities usage for non-residential structures (**1.4**). An annual emissions report from across the municipality will offer a clear picture as to the progress made towards becoming a low-emissions village.

The Village should continue to take a comprehensive and proactive approach to reducing emissions from the built environment. The actions included have been selected as having the most out-sized impact on emissions, and will be a substantive improvement over existing conditions, while being achievable on an imminent timeframe.



Conclusion

While the actions recommended within *Bright Climate Future 2035* discuss what actions *should* be implemented, further considerations on *how* they are implemented will determine the effectiveness towards bringing about the Village's desired change of course.

- Firstly, an equitable implementation is necessary for all actions. No community members should be disproportionately excluded from the benefits of these actions, or burdened with their associated costs.
- Additionally, coordination between the Village and community partners is imperative. Collaboration with a broad range of stakeholders will be necessary to achieve various actions, and the working relationships this develops can provide a mutual benefit towards achieving the plan's goals.
- Finally, the Village will need to consider what grants and subsidies it can utilize and prioritize actions accordingly. This work cannot be complete without additional budget, thus a variety of financing programs have been proposed to help meet this plan's goals. Pursuing different financing actions will affect the action implementation process.



Equity

River Forest is a generally privileged community with a high-income level (median \$144,000) and educational attainment (a majority of adult residents have a Master's degree)⁷, positioning it well to tackle climate change. As a result of this advantage, River Forest is responsible for sharing its wealth of knowledge and resources with other C4 communities committed to achieving sustainability within their areas.

The Village has a responsibility to pay attention to the most vulnerable population groups within River Forest, its aging populations, low-income individuals, and those with limited mobility. River Forest should prioritize spaces where people are the most vulnerable and identify and provide support where it is needed.

Every person may experience different circumstances that prevent them from participating in sustainability efforts to the fullest capacity. This plan seeks to provide solutions to mitigate these barriers which include actions like subsidized energy assessments and changing the default gas water heating settings (at no cost) to impact a strong baseline of residents. The recommendations also utilize an accessible approach by improving bike and sidewalk infrastructure to assist with challenges different populations may face. Finally, *Bright Climate Future 2035* seeks to make an investment in resilient infrastructure across the Village that all can benefit from.

The plan also seeks to address financial barriers and to provide support for funding green initiatives (see **Financing** and **Alternative Funding Sources**), allowing full participation in climate actions across the population. Additionally, it seeks to understand and increase residents' knowledge of sustainability efforts so that local policymakers can develop and implement green programs in the Village.

Overall, the plan is focused on creating a more equitable and sustainable future for everyone in River Forest. By collectively supporting one another, community members can contribute to a River Forest that is resilient, healthy, and environmentally conscious.



Source: Village of River Forest

⁷ River Forest data snapshot, CMAP, ACS 5Y estimates, 2017-2021, <https://www.cmap.illinois.gov/documents/10180/102881/River+Forest.pdf>

Coordination

To achieve this plan's climate action goals, a comprehensive stakeholder coordination strategy is of utmost importance. At the core of this strategy is the need for River Forest, potentially guided by the sustainability commission, to foster open and ongoing collaboration with a diverse array of stakeholders inside and outside of the Village.

MUNICIPAL

Coordination within Village government will be essential, particularly with departments overseeing public works, development services, and transportation. Additionally, the Village will need to partner with the River Forest Park District on resiliency actions, the River Forest Public Library on community engagement actions, and the River Forest Township will need to assist with funding and service programming. Aligning climate strategies with current and future municipal policies and infrastructure plans will ensure initiatives are well-integrated within the community and financially and politically supported.



River Forest
Public Schools

REGIONAL & STATE

- Engagement with regional planning and transportation agencies, such as CMAP, IDOT, RTA, PACE, and Metra can help integrate sustainable, accessible, and equitable mobility options into the broader transportation network. Further collaboration with advocacy organizations including Vision Zero Chicago, Active Transportation Alliance, and Commuters Take Action will bolster community action and support.
- The Metropolitan Water Reclamation District (MWRD) of Greater Chicago will also be a key resource for the Village as it implements the resilience projects outlined in this plan, to help with funding, integration, and guidance.
- Finally, River Forest should maintain a strong relationship with the Illinois Commerce Commission to ensure adequate improvements to natural gas and electric utilities are made.



FINANCIAL

Innovative financing mechanisms, such as public-private partnerships, green bonds, and regional, state, and federal grants, will require coordination with all public agency levels, as well as the private sector. This collaboration can unlock additional funding sources and share the costs and responsibilities for implementing large-scale projects. The likelihood of receiving state and federal grant awards to fund projects is strengthened through joint applications with neighboring municipalities and letters of support from elected officials across jurisdictions (see **Financing** and **Alternative Funding Sources**).

COMMUNITY STAKEHOLDERS

Throughout this process, the Village government should maintain open communication and facilitate collaborative decision-making with a broad network of stakeholders, including residents, businesses, community organizations, academic institutions, and utility providers. This cross-sector approach will be vital to ensuring the climate action implementation is tailored to the needs of River Forest, leveraging diverse resources and expertise, and maximizing community-wide participation and impact.

By strategically coordinating with this wide range of stakeholders, River Forest can successfully implement a comprehensive, community-driven climate action plan that prepares the municipality for the challenges and opportunities presented by climate change.

Alternative Funding Sources

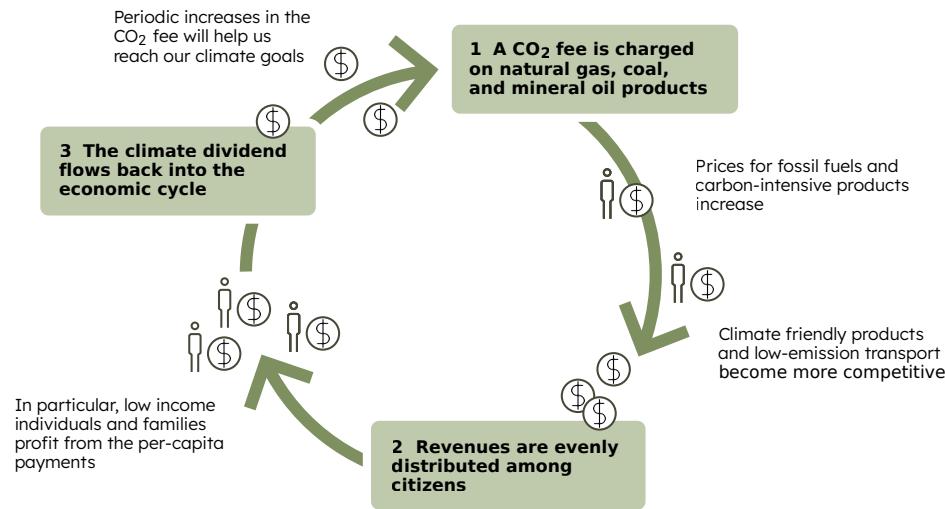
It is clear that River Forest will not meet the goal of reducing emissions by 65% without some ability to fund necessary community upgrades. While a portion of the required changes may be paid for with the existing grant or rebate programs listed above, River Forest is at a disadvantage when applying for federal grants, as most are targeted towards low-income residents and communities.

While this is a drawback for higher-level government funding, it shows that the community has considerable locally-held resources to make the required changes, and should consider how various funding schemes might allow this to happen. Most of the recommended actions in *Bright Climate Future 2035* have high up-front costs, but see returns such as lower energy bills, better health outcomes, and reduced flood risk over a longer timespan. The following financial solutions are suggestions of ways to amortize the initial cost over a longer time period, within the constraints of municipal financing:

AN ENERGY EMISSION FEE AND DIVIDEND PROGRAM

- **How it works:** Utility bill taxes for natural gas and electricity, as well as motor fuel sales taxes, would include a local fee commensurate with the amount of GHG emissions associated with the usage of such fuel. The entirety of the program's revenue would be rebated as a dividend to all residents with equal apportionment.
- **Why it works:** On average, every resident would not be gaining or losing money. In practice, the highest emitters would be losing money, and the lowest emitters would be financially rewarded. As high emitters are thus incentivized to reduce emissions, the overall average emissions will gradually lower.
- **Why it's recommended:** While introducing a new tax is difficult, the rebate structure is in line with equitable practices. Larger homeowners will be incentivized to make significant improvements to their home HVAC efficiency, while smaller homeowners with less energy consumption per capita will see a rebate.

Figure 29: An example of a carbon dividend cycle⁶⁷



A NEW TIF DISTRICT

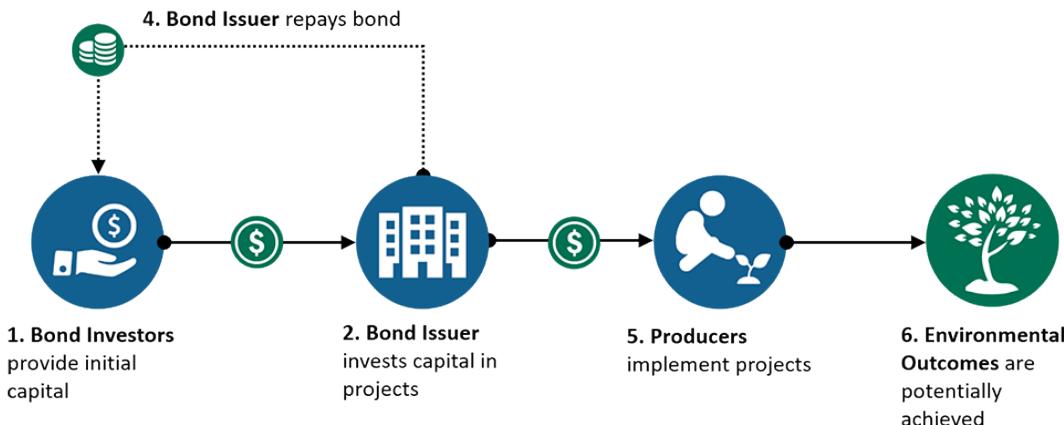
- **How it Works:** Increases in property value are set aside for a special taxing body, which can distribute funds towards a variety of local projects.
- **Why it works:** River Forest is a desirable place to live, but also a costly place to do public works projects. Since these benefits are widespread throughout the community, a TIF ensures those benefits are reinvested at the community level as well. The Village can consider building a new TIF District in our recommended transit improvement corridors.
- **Why it's recommended:** As little new housing is built in River Forest, a lack of housing supply with steady or increasing demand will increase property values. Local property value increases can be reinvested to local projects.

⁶⁷ RobbieanMorrison. CO₂ (or carbon) fee and climate dividend scheme. 2017. Wikimedia. https://commons.wikimedia.org/wiki/File:Ccl_climate_dividend_cycle_english.svg

MUNICIPAL GREEN BONDS

- **How it works:** The Village can issue a bond to finance projects that generate identifiable climate benefits.⁶⁸ Residents loan the municipality the resources needed to make necessary upgrades now, and see immediate returns locally. (See “[How to Issue a Green Muni Bond](#)”)
- **Why it works:** Issuing a green bond will ensure an influx of cash in the short-term to begin financing the recommended projects. Once projects are complete, the Village can use newfound savings to begin paying it back.
- **Why it is recommended:** Engaged residents with ample resources can amplify their overall benefit per dollar amount with municipal coordination of funding with this safe investment.

Figure 30: An example of a municipal green bond process⁶⁹



A COOPERATIVE FINANCE ORGANIZATION

- **How it works:** Residents enter into a cooperative loan program with a local financial institution. Projects are phased over time, so initial recipients will continue to provide capital shares as later recipients are phased in. The program will wind down when cost savings as a result of all completed projects stabilizes.
- **Why it works:** Projects with a long-term return on the initial investment are rated, and the cost is amortized over the entire cooperative.
- **Why it's recommended:** As a peer-to-peer financing program, this does not involve taxation, merely coordination. Working through the Village to rate projects by expected financial return would create an expectation of stable returns, encouraging residents to buy into the program without high risk.

MUNICIPALIZATION OF CONSULTANT WORK

- **How it works:** The Village can review all previous consultancy work by cost-per-work hour, and use expected future workloads to weigh the financial prudence of hiring a full-time staff position in lieu of private consultants.
- **Why it works:** As new programs and the commonality of retrofitting projects requiring permits increases, the cost-benefit of hiring administrative functions though a third party will be less attractive. While not a direct source of funding, this cost-saving measure can be applied broadly throughout the recommended actions of *Bright Climate Future 2035*, in combination with other funding schemes.
- **Why it's recommended:** Village staff is attuned to common local issues, and institutional knowledge built within the Village will lead to better outcomes with less time expended per function. Opportunities may exist to share staff with other C4 communities if workloads do not necessitate a full Village staff member in River Forest alone.

⁶⁸ MSRB. About Green Bonds. 2018. <https://www.msrb.org/sites/default/files/About-Green-Bonds.pdf>

⁶⁹ Enviroaccounting. Standard Green Bond. December 2020. <https://enviroaccounting.com/green-bonds-and-pay-for-performance/>

Future

This plan is part of a global effort to address the causes and impacts of our shared changing climate. While much will remain to be done at the plan's intended conclusion in 2035, the Village will be on its way toward its many futures: A Low-Emissions Village, an Adaptable & Prepared Village, and an Engaged & Informed Village.

A lot can change in 10 years! The intention of *Bright Climate Future 2035* is to serve as a springboard for future planning efforts to follow. As the impacts of climate change on weather systems becomes more clear, specific planning efforts could be directed towards adaptation programs. As the low-hanging fruit of the Village's climate action strategies are met through this plan, future climate planning efforts will need to focus on categories of actions that are harder to achieve:

- Emissions from difficult sources such as the production of consumer goods, concrete construction, or the intercity business travel of city staff may need to be addressed.
- Reactive analysis of subsequent major climatic events will be necessary to effectively adapt to the new climate and ensure a resilient urban fabric.
- Countering disinformation about climate change through public education programs will become even more imperative, as news sources continue to fragment information and scientific research is challenged.

The changing climate is a global issue with no simple solution. There should be no assumption that this plan will completely resolve the effects of climate change on the Village. Instead, this plan should be seen as an ongoing effort to prepare the Village for improved future outcomes. Through the actions laid out in *Bright Climate Future 2035*, the Village can choose to lay the groundwork for a radically better future befitting the unique community of River Forest.

