EPA

State and Local
Energy and Environment Program

Local Action Framework:

A Guide to Help Communities Achieve Energy and Environmental Goals

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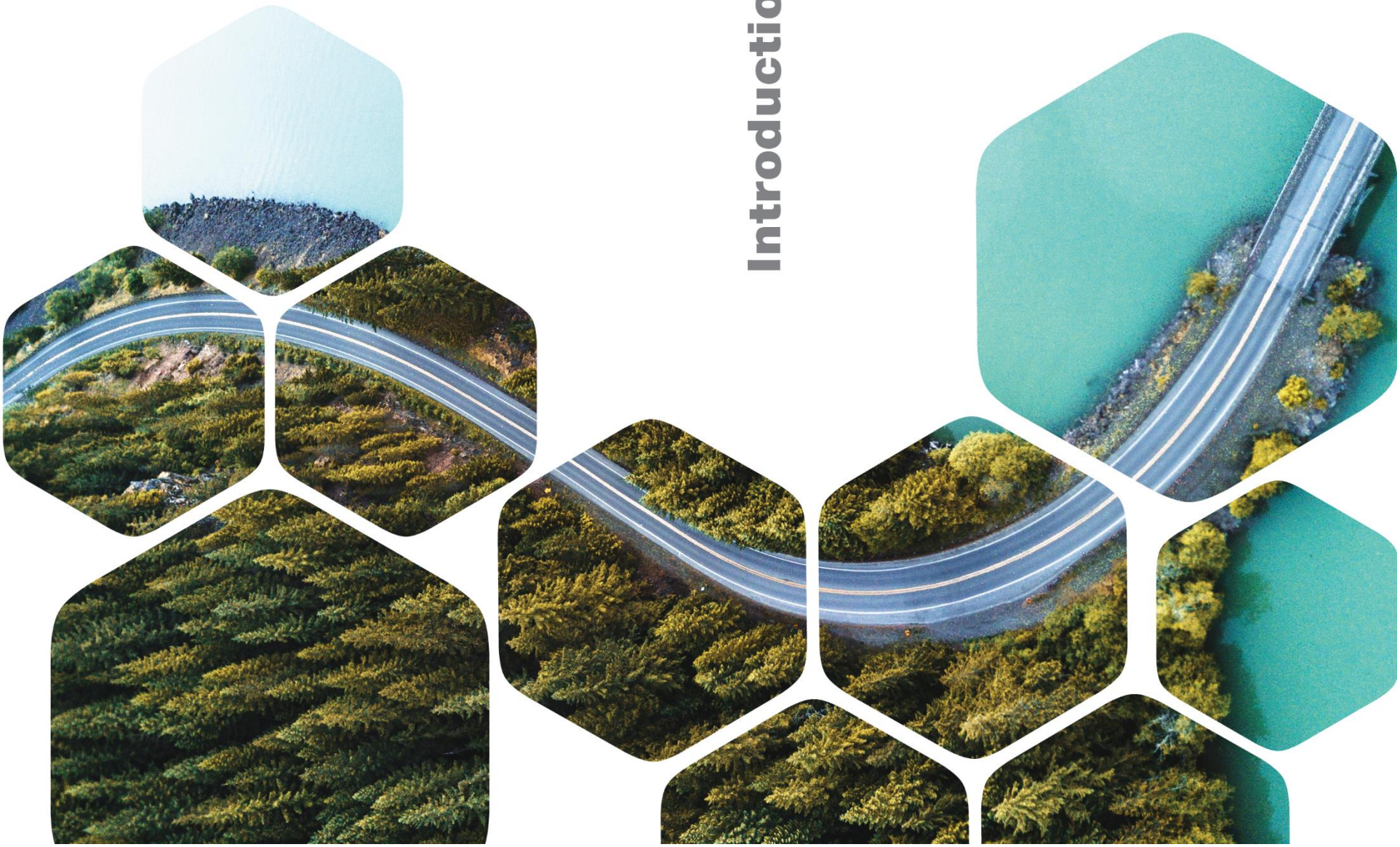
Contents

Introduction



Local and tribal governments can achieve a wide range of community benefits by implementing energy and environmental projects. These benefits include reducing greenhouse gas (GHG) pollutants, improving air quality, lowering energy costs, supporting local economic development, improving public health, and increasing energy system reliability.

Many local and tribal governments have already taken action by building sustainable communities, promoting green government operations, and adopting policies to improve energy efficiency and promote renewable energy. This guide is designed to help local and tribal governments plan, implement, and evaluate new or existing energy or environmental projects. It is intended for small and medium-sized communities and tribes, although the information may also be relevant for larger jurisdictions or states embarking on similar projects. Similarly, although the guide is focused on the project level, the information may also be relevant for programs or policies (see the box describing the difference between projects, programs, and policies).

This guide is based on best practices identified by the U.S. Environmental Protection Agency (EPA) through the Agency's extensive work with local and tribal governments. EPA recognizes that each local and tribal government is an expert in its own community; however, given the Agency's experience working with many local and tribal governments, it is well-positioned to share information and lessons across the country. EPA solicited feedback on this guide from a range of state and local government stakeholders, as identified in the acknowledgements section in each specific phase.

The Difference Between Projects, Programs, and Policies

A **project** has a limited scope, and specific tasks can be defined upfront, such as installing green roofs on municipal buildings. In contrast, a **program** has overarching goals and objectives, but specific projects and tasks to meet those goals (e.g., increase community resilience to impacts from rising sea levels) will evolve over time. A new project that is part of an existing program has a limited scope that meets the goals of a larger program, such as expanding a community-wide commercial energy efficiency program to residential energy consumers. A **policy** is articulated in legislation or regulations to guide and inform present and future decisions.

How To Use This Guide

This guide covers six energy and environmental project implementation phases (see Figure 1). These phases are interrelated, so there are many possible paths a community can take through the implementation process. You do not need to complete the phases in order. However, if you are designing a new project from scratch, you may want to start with the Engage and Communicate phase and explore subsequent phases following a clockwise approach.

Figure 1. Implementation Phases of the Local Action Framework

Several elements in this guide are clickable. Clickable graphics, banners, and text allow for easy navigation among the six project implementation phases and steps within each phase. Clickable text also links to external web pages, videos, or online content to provide additional information about the case study, resource, or tool. Throughout this guide, you will also encounter three icons:

Equity icons call attention to opportunities to include diverse perspectives in decision-making and consider the full range of potential impacts on your community.

Helpful Tips icons identify information that could make planning and implementing your energy or environmental project more efficient or effective.

Case in Point icons provide examples of other communities' experiences.

At the end of each implementation phase, the guide offers additional examples from the field, tools and templates, and further reading.

Engage and Communicate

Engaging and communicating at all stages of project implementation can help community leaders:

- Align their project objectives with community priorities
- Gather input from the community, especially from individuals directly affected by the project and the most vulnerable or historically underserved groups
- Increase support for the project.

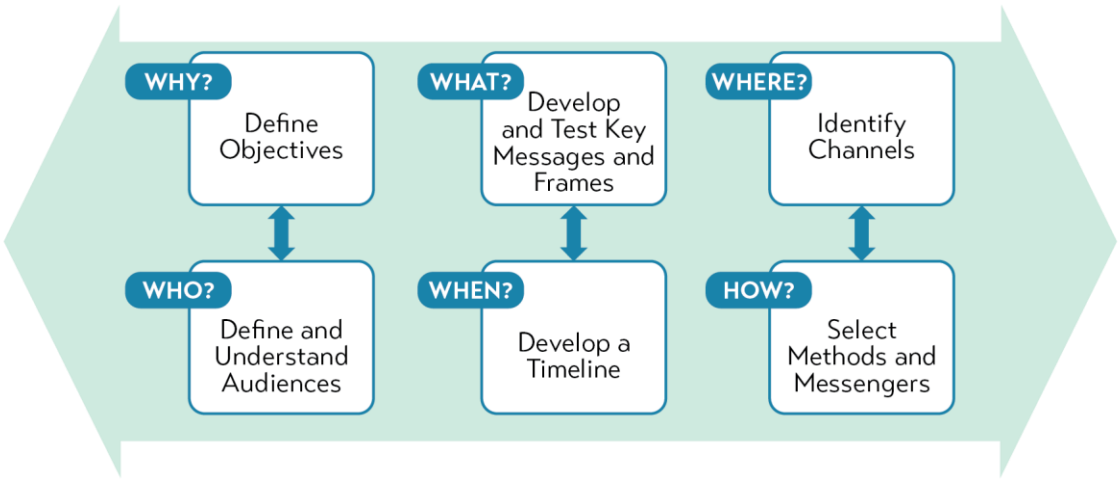
WHY?	Define Objectives
WHO?	Define and Understand Audiences
WHAT?	Develop and Test Key Messages and Frames
WHEN?	Develop a Timeline
WHERE?	Identify Channels
HOW?	Select Methods and Messengers

The steps presented in this phase are intended to help you develop and implement an effective engagement and communication strategy. To maximize the effectiveness of sharing and gathering information, leaders have found it helpful to use **simple messages, repeat them often** over **multiple channels,** and use **trusted sources** to communicate.

Key Steps

While the exact process for engaging and communicating varies by project and community, the steps in this phase, as presented in Figure 2, can be part of any outreach process. The steps are organized around six basic questions: why, who, what, when, where, and how? The steps are not necessarily intended to be pursued in linear order.

Figure 2. Overview of the Key Steps for Engaging and Communicating



Step 1. Define Objectives

It is important to identify and clearly articulate the objectives of your communication strategy—***why*** are you engaging in communication activities? Defining your objectives helps inform decisions you make about audience, messages, timeline, channels, methods, and messengers. Clearly defined objectives can also help you recalibrate if your initial communications efforts do not accomplish your objectives.

Your objectives may be overarching, such as raising public awareness about the benefits of energy efficiency technologies, or more specific, such as increasing decision-makers' understanding about the barriers residents face in using alternate transportation options. Additionally, specific objectives may relate to target audiences or times for outreach. For example, an early project objective may be to increase participation and support from key decision-makers, while an objective later in the project may be to share project successes with the public to justify similar efforts in the future.

As you develop communication strategy objectives, you may want to consider:

- What are the overarching goals for the project? Visit Set Goals and Select Actions for more information.
- How can outreach and stakeholder engagement support the project and project goals?
- Do stakeholders—including decision-makers, community members, and experts—need to take action to accomplish project goals?
- Will stakeholders, especially vulnerable or historically underserved groups, be affected by this project? What will they need to know?
- What types of information or feedback do you need to gather from stakeholders to help ensure the project's success?

Below is a list of sample objectives:

- Increase project participation.
- Gather feedback on the project plan.
- Increase financial project support.
- Understand stakeholder needs.
- Share information related to the project.
- Educate the public.
- Raise awareness about available resources.
- Share successes to encourage continued activity.

Step 2. Define and Understand Audiences

Getting to know ***who*** you are trying to reach will help you develop an effective outreach strategy. Understanding your audience will help you identify the most effective messages, messengers, and channels.

The following groups may be among your audience members. Where available, this list links to Climate Showcase Communities (CSC) Tip Sheets for working with these groups. CSC was an EPA program that helped local and tribal governments pilot innovative, cost-effective, and replicable community-based GHG reduction projects.

- Administrators of complementary or similar projects
- Business owners
- Community-based organizations
- Community leaders
- Disabled populations
- Contractors
- Experts
- Faith-based organizations
- Green teams or sustainability groups
- Homeowner associations (e.g., condo boards)
- Landlords
- Local political leaders and decision-makers
- Low-income residents
- Minority populations
- Neighborhood associations or block groups
- Non-profits
- Other jurisdictions or local organizations
- Potential project funders
- Renters
- Residents
- Students
- Universities
- Utilities
- Volunteers

Once you have identified ***whom*** you need to engage, it is important to better understand what motivates them, how they receive information, and whom they trust. It is also important to understand any barriers that may prevent your target audiences from participating. Different groups of stakeholders have different motivations and barriers, and will access information in different ways.

You can get to know your audiences through informal or formal channels. Informal channels include having informal phone calls or meetings with representative members. More formal channels include partnering with organizations who work closely with the target audience, using focus groups or conducting a pilot study, phasing the project release, researching similar efforts to help test and improve your communications strategy, or using community-based social marketing techniques. You may find that you can group some of your target audiences together or that you prefer to segment your audiences into smaller groups. These types of activities may also be appropriate as you complete Steps 3 through 6.

For each of the following steps, you can benefit from continuing to ask the question: *Does this decision help me reach my target audiences?*

Step 3. Develop and Test Key Messages and Frames

Creating effective key messages can help you use ***what*** motivates your target audiences to accomplish your community's or organization's objective.

It is best to frame your messages in a way that resonates with your target audiences. Frames or framing refers to how you present or package an idea and can matter as much as the idea itself. It is a good idea to present or frame your messages with language, images, and points that are meaningful and easily understood by the people you are trying to reach. The following are suggestions for developing effective messages:

- **Research**. What messages have been used effectively to encourage action for similar projects in other jurisdictions or local projects that target similar audiences? You can look for information about your audience online or engage other communities or groups that are doing similar work. If you are running a project to increase recycling, it may be helpful to review the key messages used in other jurisdictions for similar projects. If students are your target audience, you can talk to staff members who were responsible for running projects that target students. You may find that some of your

most useful lessons about messaging come from projects that appear unrelated to your objectives, but target similar audiences.

- **Ask and listen**. What does your audience say they want? You can ask stakeholders what they value and draw connections to the project goals. If your community is working on a transit ridership project, you might ask people why they are not riding the bus. Asking stakeholders for input, then choosing not to act on it, may alienate the people you are seeking to engage, so it is advisable to thoughtfully consider all suggestions (see Helpful Tips: Messaging). If your audience has ideological differences, searching for common ground, goals, and values can increase the project's success.
- **Test your message**. Is your message effective? You can start by developing several possible messages that introduce your objectives. You can test the different messages on focus groups or pilot groups before broadcasting the selected one more broadly. Small changes in language may have a significant impact on how the target audience receives the message.
- **Phase your rollout**. If the project timeline permits, you can roll out your message in phases for different channels or audience segments. Phasing allows you to adjust the message prior to sharing it with the entire target audience.

Helpful Tips: Messaging

It is best to repeat messages **early and often,** and through multiple channels. Stakeholders are likely to be more receptive to new ideas and actions if they have been part of the conversation from the beginning and they feel their input is taken into account. It is advisable to engage stakeholders at a point when you can use their input to improve the project outcomes. It is also best to be clear about how you are going to use stakeholders' input.

Other communities have found the following tips helpful in developing messages:

- **Tailor your messages.** Different audiences may be motivated by different things. Constructing messages for different audiences is good practice. You may want to divide your audiences into groups (or segments) and tailor messages for each group. For example, Denver Energy Challenge project staff in Denver, Colorado, asked participants what motivated them to take steps to adopt energy-efficient appliances and practices. The staff found that businesses were primarily motivated by cost savings and homeowners were primarily motivated by increased comfort. Consequently, the project staff adjusted their messages when communicating with these two groups of stakeholders.
- **Consider translation needs**. Messages tailored to different audiences may require different communication methods and channels. Translating tailored messages into the common local language or languages of your audience is a good practice. If you attend a community event for outreach purposes in a community that primarily speaks another language, it is helpful to bring someone from your organization who speaks that particular language.
- **Present information in an accessible way**. For example, the U.S. Energy Information Administration's Energy Kids is an interactive website that educates students, citizens, and others about energy with games and activities.
- **Use locally specific slogans or terms**. For example, the term "climate adaptation" may have different implications in tribal communities because many tribes have already been adapting to environmental changes for generations.

- **Use a storytelling approach and visual imagery.** Stories are often more relatable and tangible than data. Similarly, visual imagery is often more compelling than words or numbers. For example, the City of Arlington, Texas, presented the annual city budget in an easily accessible video. The Town of Cary, North Carolina, built a Climate Showcase Fire Station where it could host public tours to highlight green building principles used in the construction.
- **Present a positive message**. People are more likely to join a project that offers benefits than one that demands a sacrifice. For example, the Capitol Area Metropolitan Planning Office in Austin, Texas, gives away bookmarks with pro-transit messages as part of its Commute Solutions program, reinforcing the idea that people can regain and enjoy additional leisure time during their daily commute.
- **Consider creating a brand**. This might include developing a recognizable logo, a catchy tagline, or a memorable name for the project or the group that is implementing the project. The Clear the Air Challenge in Salt Lake City, Utah, used the tagline "Drive Down Your Miles" to remind residents to think about alternative transportation options.
- **Introduce new ways of doing things**. For example, Idle Free Utah began its campaign to reduce idling in school parking lots because the concentrated collection of parents, students, teachers, and staff during school drop-off and pick-up times made idling highly visible. This led to a larger campaign to encourage drivers to turn off their vehicles when idling for more than 10 seconds.
- **Collaborate**. You can work with organizations that have related, but different, messages to reach new audiences. In Rhode Island, Providence's Climate Justice Plan specifies that the Office of Sustainability must collaborate with community organizations on every initiative it undertakes. This process allows for collaborative decision-making, although it can take time to build relationships and trust between everyone involved in the decision-making process.

EPA's Effective Practices for Implementing Local Climate and Energy Programs: Effective Messaging offers more tips from other communities.

Step 4. Develop a Timeline

Local governments have found that developing a timeline for engaging and communicating with stakeholders can help maximize project impact. When developing a timeline for outreach, it is helpful to take into account project timing, audience preferences, and available resources. You may also find that you need to revisit and adjust your timeline after you identify channels, methods, and messengers (Step 5 and Step 6).

As you develop an outreach timeline, you may want to consider the following questions:

- ***When* would critical project milestones** benefit from outreach or communications activities? For example, are there critical decision points that would benefit from stakeholder input?
- ***When* are audiences likely to be most receptive** to hearing messages or engaging in a conversation? Can you leverage existing meetings, such as regularly scheduled community meetings, or publication schedules? For example, you may be able to schedule an article about the project to appear in a specific related issue of a local magazine with monthly planned topics.

An effective timeline for communications balances both of these considerations. Each project has a unique set of resources and goals, so the ideal times to engage will vary.

Step 5. Identify Channels

Where will you reach your audiences? How does each target audience currently receive information? The more places audience members encounter a message, the more likely they are to remember it. Your engagement and communication objectives will also guide your choice of channels. Some channels are more appropriate for sharing information, and others are better suited for encouraging dialogue.

In addition to sharing information with the public, engagement and communication involves receiving community input as well. It is often helpful to establish set communication channels so members of the public can share their own ideas and provide feedback to decision-makers. Such communication channels could include a specialized email address or phone number specifically for addressing feedback on a proposed energy or environmental project. This can help determine what is important to your audience and better engage the public in your decision-making process.

Communities have found the following examples of communication channels useful:

Television: Local stations or programs.

Internet: Blogs, websites, social media (e.g., Facebook, Twitter, LinkedIn, YouTube, and Instagram).

Print media: Local or regional newspaper, magazine, or newsletters.

Radio: Local or regional radio stations.

Mail: Direct mail to target audiences, including utility bill inserts.

Printed handouts: Flyers, posters, fact sheets, door-hangers, yard signs, stickers, or other materials printed by the project.

Email: Messages directed to target audiences (individuals or email lists); many include interactive links.

Phone: Text messages or phone calls.

In-person: Person-to-person conversations, community events, or trainings.

Understanding the ways people interact with different channels will help you craft the timing and substance of your message accordingly (see Helpful Tips: Channels).

Helpful Tips: Channels

It is best to use channels that are accessible, familiar, and comfortable to the audience. For example, a smartphone application or a text message campaign may be an effective method to reach some, but not all, audiences, while a radio campaign may be more effective with other audiences. Repeating messages from trusted sources often, over **multiple channels,** increases their chance of effectiveness.

Step 6. Select Methods and Messengers

Selecting your methods and messengers determines ***how*** your audience receives the message—in what format and from whom. It may make sense to identify methods and messengers at the same time as you identify channels (Step 5). How you choose to deliver messages may also involve revisiting your timeline (Step 4).

Who delivers your message can be as important as how it is delivered. You can identify people, organizations, and channels that have credibility with your audience and engage them to help deliver your message as project champions. You may want to consider using the same community leaders or organizations that were engaged in the design and development of the project. Many communities have found it less successful to bring a fully formed idea to a community organization and then ask them to advocate for it.

Different messengers may be more effective with different audiences (refer to Step 2). When reaching out to specific organizations, it is advisable to identify which people within that organization are best able to reach your target audience. You can engage and empower credible sources to spread project messages to stakeholders on your behalf. These sources may want to author emails, write letters to the editor of local newspapers, participate in interviews, make announcements at events, or organically spread the word.

Other communities have had success by coming up with creative strategies to engage stakeholders and spread messages. Table 1 summarizes different methods and associated channels (refer to Step 5) that other communities have found useful to spread messages. This list is by no means exhaustive. As you consider this table, you can tap into the creativity of your staff and volunteers to identify the best ways to engage your target audiences.

Table 1. Communication Methods and Associated Channels for Taking Local Action

PURCHASED MEDIA	EARNED MEDIA	PROMOTIONAL OR INSTRUCTIONAL VIDEOS	TESTIMONIALS	WEBSITE WITH PROJECT INFORMATION	SMARTPHONE APPLICATIONS	SMS AND TEXT MARKETING
						
Purchase advertisements for TV, radio, newspapers, magazines, or the internet. Think about advertising at local events, such as high school sporting events or local fairs.	Cultivate relationships with local news outlets, editors, and reporters. Consider pitching your stories to staff at traditional media or online media platforms. Write press releases like articles so that they are easy for newspapers and magazines to pick up.	Online videos can be hosted on websites, such as YouTube, and links can be shared through email, text messages, social media, blogs, and other online portals. The North Central Texas Council of Governments' Transportation Department YouTube channel posted a 2-minute video to highlight the Solar Ready II project in the Dallas-Fort Worth, Texas, area.	Testimonials are often shared through online videos, a Twitter campaign, a Facebook page, an editorial column in the newspaper, or other sources. Highlight success stories from early adopters, project champions, or other participants to encourage future action or project adoption. Explain why the project matters. Consider videos that incorporate text and images. Ask open-ended questions during interviews.	Host a website with the project information in one place including videos, promotional flyers, and informational materials. Drive traffic to the website by posting content and links in emails, newsletters, and on social media. Consider asking website visitors to provide information relevant to the project. The National Renewable Energy Laboratory's Open PV Project provides information about solar power and allows users to upload information about their solar projects.	Developing a portal for users to engage with the campaign or gather information on their smartphone may also help increase participation. Consider coupling this strategy with an interactive game, the ability to track progress, or a challenge to meet. Ensure smartphone applications are compatible with multiple types of phones.	Consider using short message service (SMS), or text messages, as a quick way to provide stakeholders with important information. For example, Salt Lake City, Utah, sends text alerts to let participating residents know about poor air quality days.

SOCIAL MEDIA	DIRECT MAIL	ACTION CHECKLISTS	INFORMATIONAL CAMPAIGN	COMMUNITY EVENTS	COMMUNITY MEETINGS	DOOR-TO-DOOR CANVASSING
						
Social media allows local governments to interact with large audiences. Community members can access content, provide feedback, and stay updated about projects or initiatives as information is announced. Consider using the Pew Research Center's Internet Project to identify social networking sites frequented by your target audiences.	Although people are increasingly gathering information online, direct mail can be an effective method for targeting households or businesses within a specified area (e.g., by ZIP code or city). For example, some communities use inserts in utility bills to reach people for energy efficiency, water conservation, or waste reduction projects.	Develop action checklists to provide people with discrete actions to take. Checklists can remind people to remain involved in project initiatives. For example, a community might encourage residents to use reusable grocery bags, replace two incandescent light bulbs with energy-efficient LEDs, and run the dishwasher on a 4-hour delay so that it runs during off-peak hours.	Distribute materials and host classes or workshops to help spread information about the desired actions. For example, the Cambridge Bicycle Programs in Cambridge, Massachusetts, developed and distributed informational materials including bike maps, and hosted educational events including bike registration and on-bike training.	Participate in existing events or host your own, such as hosting a booth at the county fair to share information or entering a float in a local parade to increase project recognition. Leveraging events held by others helps to reach broader audiences with lower time and resource investment. For example, Eugene, Oregon, hosts "Sunday Streets," an annual event that encourages healthy, active living.	Invite stakeholders to a meeting accessible to all members of the public. Share project information and provide an opportunity for feedback, questions, and answers. Consider choosing a location reachable through public transportation and holding meetings at various times to accommodate different work schedules to increase public participation.	Use volunteers or paid canvassers to go door-to-door to talk to businesses or residents in person. For example, in Corvallis, Oregon, student volunteers went door-to-door to invite people to try three energy-saving actions for the Communities Take Charge program.

GREEN TEAMS AND SUSTAINABILITY GROUPS

Facilitate the creation of green teams or sustainability groups to increase the capacity to implement project actions at the business, block, or neighborhood level. Ensure that green teams represent the community, include key decision-makers, and include a champion to inspire and motivate people. For example, the Land-of-Sky Regional Council in North Carolina helped 18 schools initiate green teams that empowered students and teachers to collaborate on recycling and energy reduction projects.

NEIGHBORHOOD PARTIES

Identify hosts to talk to their neighbors about the effort. For example, the Frederick County Green Homes Challenge in Maryland used a neighbor-to-neighbor approach to successfully share information about residential energy efficiency upgrades. In Eugene, Oregon, transportation ambassadors were trained to spread information about alternative transportation to their neighbors.

PEER-TO-PEER EXCHANGE

Use social media and enthusiasm in your community to pass information from person to person. This can result in a "viral" spread of information—meaning the rapid spread of internet content through social networks. Making content shareable on social networks is important. This helps community members spread awareness of a project or event with a click of a button.

AWARDS

Use awards or certificates to reinforce the concept of accountability, increase the visibility of a project, and recognize and demonstrate appreciation for participants.

CHALLENGES AND COMPETITIONS

Implement challenges or competitions to inspire innovation within the project and increase motivation. Make challenges simple, with clear incentives and criteria. Consider providing prizes for winners. Recognize successful participants. Consider including mini-challenges to keep people interested and engaged. Aim for breadth of participation—people may join because they do not like to feel left out. Be sure to change things up to keep the campaign fresh.

COACHING

Use direct assistance as a method for encouraging implementation and ensuring successful adoption of new practices. For example, the Chicago Area Energy Savers Program in Illinois worked with energy analysts to coach building owners through the retrofit process. Owners enjoyed a single point of contact with whom to wade through an otherwise complex process.

INCENTIVES

Use incentives (e.g., door prizes, lotteries, coupons) to encourage potential participants to try a new action or adopt a new practice. For example, in Corvallis, Oregon, Communities Take Charge participants receive an electronic coupon card for discounts at local businesses when they report back on their energy-saving pledges.

INTERACTIVE GAMES

Games, used in person or on the internet, can share project information or encourage stakeholders to take action. For example, Clean Energy Durham in Durham, North Carolina, used a bingo game as part of its home energy efficiency workshops with the local Spanish-speaking community.

MEASURE SUCCESS

People are more likely to take action if they are reminded that their action makes a valuable impact. Illustrate cumulative impacts on a graphic to show how individual actions contribute to a meaningful community result (e.g., an energy-saving calculator or a "heat map" of electric vehicle charging stations or solar installations). Consider using animations to show cumulative effects over time.

PLEDGES

Ask project participants to make a verbal or written commitment to take an action, ideally in a public way. Commitments increase participation by encouraging accountability and increasing the likelihood that participants follow through on their actions. Small commitments can lead to larger commitments in the future.

PROMOTIONAL ITEMS

Giving away promotional items, or "swag," can circulate project information or increase brand recognition. Select swag carefully to avoid creating unnecessary waste with items of limited use. Identify objects that forward your mission. For example, the North Central Texas Council of Governments gave away tire gauges to remind users to improve their fuel economy by inflating their tires to the appropriate pressure.

YARD SIGNS / WINDOW CLINGS

Yard signs and window clings can be an effective way to spread information about a new project. They are especially impactful when positioned to face a street so that neighbors or cars passing by see them. For example, the Bellingham Community Energy Challenge in Washington gives yard signs to businesses and homes that participate in the challenge to show their commitment to energy savings.

Examples from the Field

Eugene, Oregon: SmartTrips
A project that developed an individualized outreach program to reduce the number of single-occupancy trips made in cars.

Salt Lake City, Utah: Clean the Air Challenge
A project that used effective community-based social marketing to improve existing vehicle travel reduction programs. A toolkit is available to help organizations seeking to replicate the program.

Madison, Wisconsin: Mpower ChaMpions
A project that worked with local businesses and schools to reduce GHG emissions, with "Lunch and Learns" and a sustainable business network, and by sharing program case studies.

Corvallis, Oregon: Communities Take Charge
A program that encourages participants to focus on three energy-saving actions each month to earn energy prize points.

Albany, New York: 2030 Comprehensive Plan
A community engagement strategy to implement Albany's comprehensive plan, which includes energy and environmental measures.

Tools and Templates

EPA's Tool Finder for Local Government Clean Energy Initiatives
A search tool that helps local government staff screen tools and resources designed to measure impacts of clean energy programs and policies.

EPA's Greenhouse Gas Equivalencies Calculator
A tool to translate GHG emissions reductions into everyday terms, which can be useful for communicating the program's goals and outcomes.

ENERGY STAR Battle of the Buildings Competition: Build Your Own Battle
Communication materials that provide information on energy efficiency and how to get involved with ENERGY STAR, including sample event ideas and promotional items to set up your own ENERGY STAR Battle of the Buildings competition.

Rasmuson Foundation's Strategic Communications Plan Template
An organization-targeted template users can apply to a community project.

MindTools' Communications Plan Worksheet
Worksheet to help structure a communications plan.

Further Reading

EPA's Effective Practices for Implementing Local Climate and Energy Programs
A series of 19 tip sheets based on direct feedback from communities; the tip sheets cover topics such as effective messaging, testimonial videos, traditional media strategies, community-based social marketing, and working with various stakeholder groups.

EPA's State and Local Energy and Environment Program's Communications Webinar Series
A three-part webcast series on communications strategies and methods that covers how to gain support and attract participation, sustain involvement, and showcase program successes.

Resource Media's Seeing Is Believing
Best practices informed by the latest research, and tools on visual storytelling.

The Goodman Center
A website that provides resources for communication through presentations, storytelling, and advertising.

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Develop Greenhouse Gas Inventory

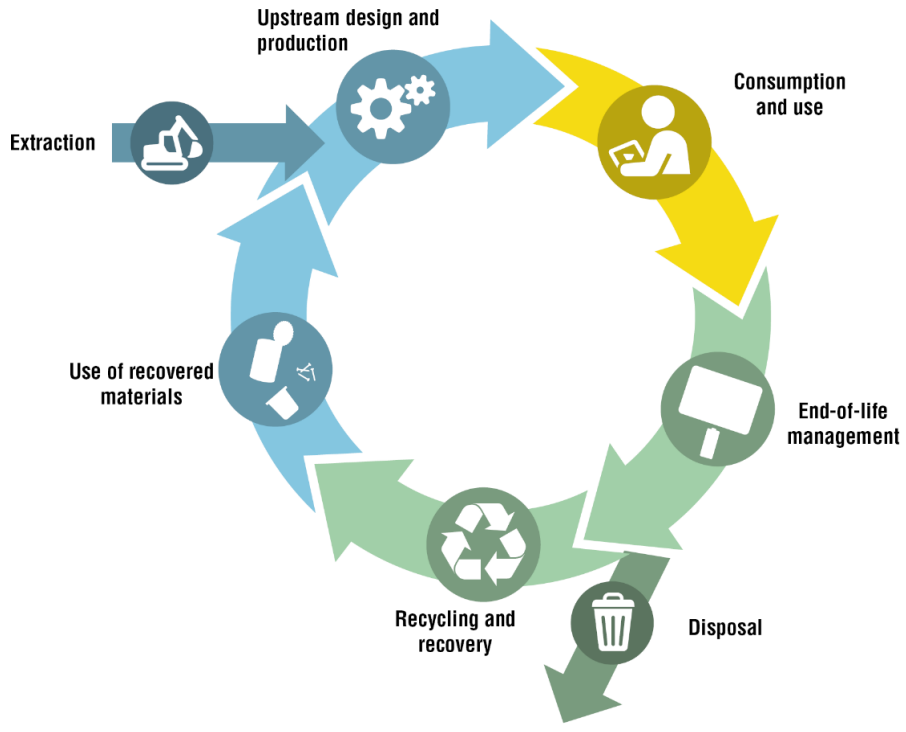
A GHG inventory is one example of a baseline that can inform goals as well as help track performance. For guidance on developing baselines for other energy and environmental attributes, see *Quantifying the Multiple Benefits of Energy Efficiency and Renewable Energy*.

This phase presents the steps to establish a GHG inventory, including establishing a baseline inventory. You could apply similar approaches to other environmental factors, such as energy and waste management (see the Life Cycle Analysis box).

The steps in this phase are presented in two approaches:

- The **local government operations** approach is for local governments that want to understand the GHG emissions of only government facilities and operations (e.g., government buildings and other facilities, streetlights and traffic signals, vehicle fleet). This may be appropriate for local government agencies interested in promoting green government operations and reducing emissions under their operational control.
- The **community-wide** approach is for organizations that want to understand the GHG emissions of their community as a whole, which can include local government operations. This approach may be more appropriate for organizations that want to implement projects to engage the community or adopt a policy to effect change in the community.

Life Cycle Analysis



This section focuses on the most common ways for local governments to account for GHG emissions from government or community activities. Another way to account for emissions involves a life cycle analysis, which assesses environmental impacts associated with all stages of a product's life—from raw material extraction to materials design and production, to consumption and use, and to disposal or recycling. These life cycle analyses include assessing GHG emissions and other environmental factors.

For more information about life cycle analyses, visit the West Coast Climate and Materials Management Forum.

Local Government Operations

Key Steps

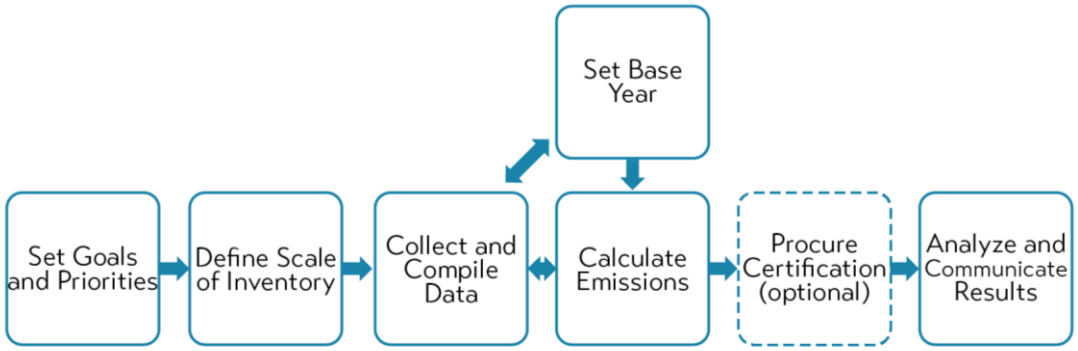
The steps in this approach are for local governments that are focused on projects related to government facilities and operations. For organizations that are focused on projects related to effecting change in the community, see the Community-Wide section.

The exact process for developing a GHG inventory for a local government varies. The guidance presented here outlines several key steps that are likely to be part of any inventory process. As shown in Figure 3, the steps are not necessarily intended to be pursued in linear order and may require multiple iterations. For example, data collection will occur over time and can influence decisions about other components of the inventory.

LOCAL GOVERNMENT OPERATIONS

- Set Goals and Priorities
- Define Scale of Inventory
- Collect and Compile Data
- Set Base Year
- Calculate Emissions
- Procure Certification (optional)
- Analyze and Communicate Results

Figure 3. Overview of the Key Steps for Developing a GHG inventory Focused on Projects Related to Government Facilities and Operations



The industry standard for GHG inventories of local government operations is the Local Government Operations Protocol (LGOP), developed in partnership by the California Air Resources Board, the California Climate Action Registry, ICLEI-Local Governments for Sustainability, and The Climate Registry. The LGOP provides guidance on calculation methodologies, emission factors, and other aspects of inventory development. The guidance here supplements the LGOP, summarizing key steps, lessons learned, and best practices for calculating GHG emissions of local government operations.

Step 1. Set Goals and Priorities

Before thinking about the details of your local government operations inventory, it is useful to clearly articulate why you are creating a GHG inventory and how it will be used. Is it to comply with a regulation? Will it inform the development of a climate action plan? Will it provide a baseline from which to monitor progress? Will it enable you to join a GHG registry? Will it be used to inform residents or employees? Having a clear understanding of your goals will inform your decisions throughout the process.

If your goal is...

- **To create a comprehensive, comparable inventory**: You may want to follow the LGOP and include emissions from all inventory sources. The protocol offers ways to estimate emissions for many sources even in the absence of data.
- **To maximize limited resources, or make the most of a partial inventory**: You may want to develop a partial inventory based on the largest sources (these are likely to be building energy use and transportation), or the sources most relevant for your planned actions. You can add other sources to your inventory over time if more resources become available.

As you set goals and priorities, think about the timeline and level of effort required to complete the GHG inventory. These will vary based on government size and available information. You may want to consider whether it makes sense to do the inventory in-house, work with a local university or non-profit organization, or hire a consultant (see Helpful Tips: Partners for GHG Inventories). You may also want to determine who will update the inventory and how often.

Helpful Tips: Partners for GHG Inventories

When assessing the level of effort required for a GHG inventory, local governments may consider partnering with other communities in their region. For local government operations inventories, local governments and communities can partner to provide mutual technical assistance and share resources, lessons learned, or best practices. For community inventories, local organizations can partner to estimate regional GHG emissions. Smaller communities that may not have the capacity or resources to conduct inventories independently or that may want to collaborate with other communities on the resulting emissions reduction activities have found this approach particularly valuable.

Step 2. Define Scale of Inventory

When deciding exactly which departments, activities, and operations to include in the GHG inventory of local government operations, you can consider your goals for the inventory (described in Step 1), as well as what falls under your jurisdiction, which sources you want to include, and how you want to organize your inventory (described below). These considerations will help you develop an estimate that includes all important emissions and avoids double counting.

Setting Organizational Boundaries: What Falls Under Your Jurisdiction?

Setting organizational boundaries is an important first step in creating a GHG inventory. It may seem straightforward to define which facilities and operations fall within the local government's jurisdiction. However, there are multiple ways to define jurisdictional boundaries. The two primary options for defining a jurisdiction are:

- **Operational control:** Under this approach, local governments account for the departments, activities, and operations over which they have "operational control," or the authority to introduce and implement operating policies. This is the recommended approach in the LGOP and the most common way for local governments to set boundaries.
- **Financial control:** Under this approach, local governments account for the operations over which they have "financial control," or the operations that are fully consolidated in financial accounts. This approach is consistent with international financial accounting standards.

Determining Which Sources to Include

In this step you decide which emissions sources to include in your inventory. The LGOP recommends including several "required" emissions sources to ensure that GHG inventories are comprehensive and comparable between communities. You may also want to target "optional" sources for reductions. Including "optional" emissions sources provides a more comprehensive image of your local government's environmental impacts and areas to target with sustainability projects.

LGOP "Required" Emissions Sources

- Fuel combustion and electricity use in facilities (e.g., public buildings, wastewater treatment plants, water pumping stations)
- Electricity use for streetlights, traffic signals, and other public lighting
- Mobile fuel combustion in vehicle fleet and transit fleet
- Solid waste facilities
- Wastewater treatment facilities

LGOP "Optional" Emissions Sources

- Purchased goods and services
- Waste generation
- Electrical power distribution
- Employee commutes
- Employee business travel
- Fugitive refrigerants
- Other Scope 3 sources (see the Important Terminology at the end of this phase)

How to Organize Your Inventory

Thinking through how your inventory may be organized can help you decide which sources to include. Options for organizing your inventory include categorization by scope (see the Important Terminology at the end of this phase for a description of scopes), sector, department, or facility. Sectoral and scope categorization are recommended in the LGOP.

Step 3. Collect and Compile Data

Having a checklist of your data needs can be useful as you begin collecting data on the sources you have decided to include. When conducting your baseline inventory, you can collect data for all potential base years that are readily available. In Step 4, you will set a base year, but it is often easier to collect data for multiple years at once than to go back to collect data for additional years if your needs change (e.g., if certain data are not available for your desired base year).

Data collection can be the most time-intensive step of the inventory process, and it may continue as you begin calculating your emissions.

It is helpful to start by reaching out to facility managers, utility representatives, and other individuals who may have data, and get a sense of what is and is not available to you. This will help you identify whether you need to make any institutional arrangements in advance to facilitate data collection. For example, utilities' procedures for requesting data may require advance notice. Local governments can establish a Memorandum of Understanding to facilitate data-sharing between organizations, if needed.

Tips for data collection include:

- **Having a single person in charge of the inventory**, an "inventory compiler," who collects data from other organizations, such as from a facilities energy lead or a wastewater treatment lead. This person can keep track of the different components and help build capacity in the organization by becoming an inventory and emissions expert.
- **Minimizing the burden of the data request** and making it easier for someone to give you the information you need. Local governments have found it helpful to give data providers a template to populate (such as a spreadsheet with labeled rows and columns) so they understand exactly what you are looking for. However, you may need to take data in whatever form your provider has readily available, for whatever timeframe is available, and then adapt it to your needs.
- **Keeping track of all units of measurement** and following up if the units in a dataset are not clear.
- **Keeping all data organized and carefully documenting all data sources** (including points of contact for collecting the data). This will make it easier for you or others to collect updated data in the future to measure your progress.
- **Documenting the emission factors and Global Warming Potentials (GWPs)** used along with the data. It is helpful to have these conversion factors readily available when you are reviewing the data and making comparisons in the future. See the Important Terminology at the end of this phase for a description of GWPs.
- **Considering what data may be helpful in the future**. It is advisable to collect related data if they are readily available, even if you are not sure yet how they may be used.

Table 2 lists a few examples of data that are commonly needed for GHG inventories, along with possible sources of those data.

Table 2. Data Commonly Needed and Possible Data Sources for GHG Inventories for Local Government Operations

Data Commonly Needed	Possible Data Source
Facilities	
• Electricity use • Fuel use, by fuel type (e.g., natural gas, heating oil, kerosene, propane, coal)	• Accounts payable • Facility managers • Local government departmental records • Public works department • Utility representatives • Fuel vendor
• Electricity emission factors	• EPA's eGRID (see regional factors in the "eGRID Summary Tables" file) • Local utility
• Natural gas emission factors	• Utility representatives (for utility-specific gas carbon content) • LGOP (for national average)

Data Commonly Needed	Possible Data Source
• Fuel emission factors, by fuel type	• Center for Corporate Climate Leadership GHG Emission Factors Hub • Inventory of National GHG Emissions and Sinks • LGOP
Transportation	
• Vehicle fuel use, by fuel type • Vehicle miles traveled	• Accounts payable • Local government departmental records • Fleet manager • Fuel vendors • Mileage reimbursement records
• Vehicle fuel emission factors, by fuel type	• Center for Corporate Climate Leadership GHG Emission Factors Hub • Inventory of National GHG Emissions and Sinks • LGOP
Solid Waste	
For emissions from city landfills (Scope 1): • Amount of waste in city landfills • Composition of waste in city landfills • Landfill gas collected at city landfills • Fraction of methane in collected landfill gas • Landfill gas collection area	*For emissions from city landfills (Scope 1):* • Landfill manager/department • Default waste composition from the state or EPA's annual report, Advancing Sustainable Materials Management: Facts and Figures • EPA's Solid Waste Emissions Estimation Tool • EPA's Landfill Methane Outreach Program • U.S. Greenhouse Gas Reporting Program
For emissions from city-generated waste (Scope 3): • Amount of waste generated • Composition of waste generated	*For emissions from city-generated waste (Scope 3):* • Waste audit • Waste hauling company • Default waste composition from the state or EPA's annual report, Advancing Sustainable Materials Management: Facts and Figures
Wastewater	
• Wastewater treatment process details (e.g., aerobic, anaerobic, nitrification, denitrification, biogas collected, system Biological Oxygen Demand (BOD_5) load) • Population served by septic systems	• Wastewater treatment manager/department

Step 4. Set Base Year

When choosing a base year, you may want to consider whether:

- Data for that year are available
- The year represents a "typical" year for your locality (e.g., no unusual weather or economic conditions)
- The base year is coordinated to the extent possible with any goals or commitments your local government may have established (e.g., to reduce emissions by a certain percentage in a specific year, to align with other government programs, to comply with external requirements).

Your inventory base year provides a benchmark against which you can compare future emissions. Inventories can also be conducted (or simply updated) regularly, in order to track progress.

GHG inventories typically describe emissions over the course of a calendar year for ease of data collection and comparison. Datasets that are available only for fiscal years or other periods can be converted to calendar years.

Step 5. Calculate Emissions

With data collected and a clear vision for which emissions to include, you can calculate emissions for each source identified in Step 2 by plugging your data and emission factors into the appropriate equations. Several resources are available to help with these calculations, including *protocols* that suggest methodologies or equations to use and *tools* that complete the calculations after you enter your data.

For each source within the inventory, you can choose a methodology for calculating emissions (see Helpful Tips: Approaches to Calculating Emissions). The primary protocol for inventories of local government operations is the LGOP, which provides step-by-step instructions and equations for calculating GHG emissions. The LGOP also provides default emission factors and alternate methodologies to choose from based on data availability. The following tips can also facilitate the calculation process.

Decide whether you want to calculate your emissions using a pre-built tool or using your own spreadsheet. Available tools include:

- EPA's Local GHG Inventory Tool: An EPA tool with two modules. The Government Operations Module implements the LGOP for GHG inventories of local government operations.
- EPA's ENERGY STAR® Portfolio Manager: An EPA interactive energy management tool that allows you to securely track and assess energy and water consumption across your building portfolio.
- EPA's Center for Corporate Climate Leadership Simplified GHG Emissions Calculator: An EPA tool designed to help small businesses estimate and inventory their annual GHG emissions.
- Tool Finder for Local Government Clean Energy Initiatives: An EPA search tool designed to help local governments screen tools that will best help analyze a program or policy.
- ICLEI's ClearPath: An ICLEI GHG inventory and emissions reduction calculator. ClearPath is free to ICLEI members.
- Tools from your state environmental or energy agency.

Work through your inventory sector by sector. For each sector (e.g., buildings, streetlights, water delivery, vehicle fleet, power generation, wastewater, solid waste), it is ideal to find the most detailed activity data available and the most locally relevant emission factors. See the Important Terminology at the end of this phase for a description of activity data and emission factors. Possible sources of emission factors beyond the LGOP include:

- EPA's eGRID and Power Profiler: Electricity use emission factors by region and power plant (eGRID) and by ZIP code (Power Profiler)
- EPA's Waste Reduction Model (WARM): Solid waste emission factors for different material types
- Carnegie Mellon University's Economic Input-Output Life Cycle Assessment (EIO-LCA): Emission factors to estimate the GHG and energy impacts of purchased goods and services.

If "ideal" data or emission factors are not available, think about alternate methods you can use to estimate emissions for each sector. For example, if local or state emission factors are not available, you can use national factors as proxies. If data are not available for the right year, you can use data from the closest year available and adjust by some factor (e.g., using population growth). The LGOP provides several methodologies. If the LGOP does not provide methodologies that meet your needs, other protocols can provide ideas:

- Global Protocol for Community-Scale Greenhouse Gas Emission Inventories
- A Corporate Accounting and Reporting Standard
- The GHG Protocol for Project Accounting
- Corporate Value Chain (Scope 3) Accounting and Reporting Standard
- U.S. Department of Energy (DOE) State and Local Energy Data.

Match methodology to goals and available resources. The best methodology to use will depend on the goals for the inventory, as well as the amount of time, resources, and data available. Detailed, bottom-up approaches may not be necessary in all cases, such as if your local government needs just a high-level, "order of magnitude" estimate of baseline conditions.

Review other GHG inventories. Reviewing inventories from other local governments, your state, and the Inventory of National GHG Emissions and Sinks can provide inspiration about data sources and emission factors.

Document all assumptions and data sources. It is important to keep detailed records on where you found the data for the GHG Inventory. Where data are not available, you may need to make assumptions. Documenting both data sources and assumptions increases transparency of the process, allows for reproduction of the GHG inventory if needed, and makes future inventories more efficient.

Use other GHG inventories to help you check your results. You can compare your estimated emissions to those of a similarly sized local government to check whether your estimates are on the same order of magnitude. It may be most useful to compare estimates on a line-item basis (e.g., only for building energy use), as total emissions may be different due to varied factors, including community size, type of electric utility, climate, or different sources included.

Helpful Tips: Approaches to Calculating Emissions

How you choose to calculate your emissions can evolve throughout the inventory process, as more data become available or as your needs change. It is acceptable to revise your quantification approach throughout the process. Generally, approaches are either:

(derived from utility bills) × utility-specific natural gas emission factor). Bottom-up approaches are preferred for local government inventories, if data are available.

information for specific geographic areas (e.g., the Energy Information Administration (EIA) State Energy Data system). Local governments can use this information as part of a proxy methodology to estimate emissions if activity data are not available. For example, if a local government does not know the amount of natural gas used to heat buildings, it could use a national or state average for natural gas use per square foot (or similar) and the building's size to estimate its natural gas use.

Note: You cannot use a top-down approach to measure your progress toward reducing GHG emissions. To measure whether sustainability efforts are working, it is essential to use actual measurements of energy use and other metrics in a bottom-up approach.

Step 6. Procure Certification (optional)

You may want to enlist a third-party review and certification of the methods and underlying data to ensure that the inventory is of high quality, transparent, accurate, complete, consistent, and comparable. Certification may also be required for participation in some GHG registries.

Examples of GHG inventory certifications include:

- California Climate Action Registry General Verification Protocol
- International Organization for Standardization (ISO) 14064-1 (inventory) and 14064-3 (verification) standards
- Carbon Disclosure Project Cities program.

Step 7. Analyze and Communicate Results

Analyze Results

Local governments have gained valuable "big picture" lessons from developing their GHG inventory. Understanding the driving forces behind emissions can help you answer questions such as:

- What are the largest sources of emissions in your local government's operations? How do your operational emissions in a sector compare to those of other, similar governments? If they are noticeably higher or lower, why?
- What are the drivers of your operational emissions?
- What are your emissions per capita? Per employee? Per heating degree-day? Per cooling degree-day? See the Important Terminology for a description of degree-days.

Continuing to monitor emissions over the course of the project (e.g., by regularly tracking key data such as energy use or by conducting an inventory every year or two) will allow you to evaluate progress. Visit the Track and Report phase for more information.

Communicate Results

It is important to communicate the results of your inventory to community members and to others within the local government. Communities have found it helpful to *tell a story* about the government's energy use emissions, and monetary savings, rather than simply reporting the numbers. For example, you could explain that the local government has relatively low electricity use compared to other, similarly sized governments, but it gets electricity from a fuel source with higher carbon intensity. In subsequent years, you can tell the story about what is driving trends in your emissions (e.g., energy efficiency efforts, economic growth, population change, weather).

One way to tell your community's story is to use EPA's GHG Equivalencies Calculator, which translates GHG emission amounts into terms that are more easily understood. For example, the calculator translates metric tons of carbon dioxide equivalent (CO_2e) into more relatable terms, like "annual emissions from X number of cars."

You may also want to consider reporting your emissions through the Carbon Disclosure Project cities program. See the Engage and Communicate phase for more information on communicating inventory results.

Community-Wide

Key Steps

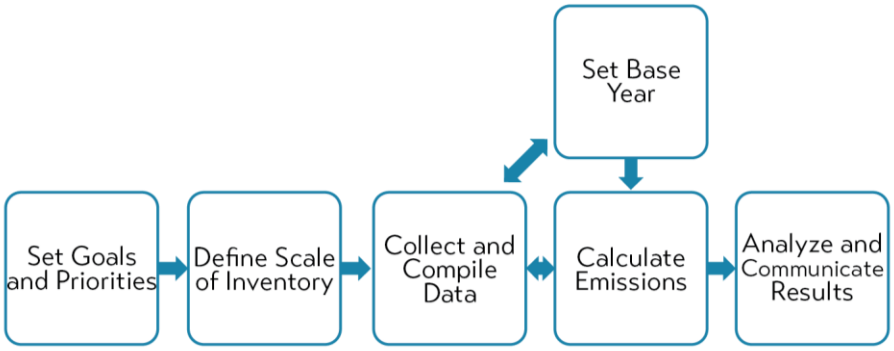
The steps in this approach are for organizations that are focused on projects to effect change in the community. For organizations that are focused on projects related to government facilities and operations, see the Local Government Operations section.

The exact process for developing a community-wide GHG inventory varies. The guidance presented here outlines several key steps that are likely to be part of any inventory process. As shown in Figure 4, the steps are not necessarily intended to be pursued in linear order and may require multiple iterations.

COMMUNITY-WIDE

- Set Goals and Priorities
- Define Scale of Inventory
- Collect and Compile Data
- Set Base Year
- Calculate Emissions
- Analyze and Communicate Results

Figure 4. Overview of the Key Steps for Developing a GHG inventory Focused on Projects Related to Effecting Change in the Community



The guidance presented here supplements other resources, such as the ICLEI U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions (ICLEI U.S. Community Protocol), summarizing key steps, lessons learned, and best practices for estimating community-wide emissions.

Step 1. Set Goals and Priorities

Before thinking about the details of your community's GHG inventory, it is useful to clearly articulate why you are creating the inventory and how it will be used. Will it inform the development of a climate action plan? Will it provide a baseline from which to monitor progress? What stories do you want to tell residents about the community's GHG emissions? Having a clear understanding of your goals will help you decide which emissions sources and activities to include (see Step 2 below).

If your goal is…

- **To reach out to community members to reduce their environmental impact:** You may want to focus on emissions from residential energy use, community member travel, and residential waste generation and disposal.
- **To identify projects that will maximize emissions reductions:** You may want to focus on emissions from the sources and activities that typically generate the most emissions and that your community can reasonably control, such as emissions from building energy use or from transportations.

- **To communicate to residents how their direct activities contribute to emissions:** You could use a consumption-based accounting approach. You can also use this approach to communicate how households with different spending patterns contribute to emissions, the emissions intensities (emissions per dollar) of different forms of consumption, and how emissions might change if consumption shifts.

As you set goals and priorities, it is appropriate to think about the timeline and level of effort required to complete the GHG inventory. These will vary based on community size and available information (see Helpful Tips: Partial GHG Inventory). You may want to consider whether it makes sense to do the inventory in-house, work with a local university, or hire a consultant. You may also want to consider who will update the inventory and how often.

Helpful Tips: Partial GHG Inventory

If your community does not have the time or resources to complete a thorough inventory, you can still develop a partial inventory based on your goals and priorities. This way, you have a baseline to work from that will be relevant to emissions and energy reduction measures.

Step 2. Define Scale of Inventory

The next step is to define the scale of the inventory, including the community boundary and which sources and activities to include. These considerations will help you to develop an estimate that includes all important emissions and avoids double counting.

Defining the Community Boundary

The boundary of a community-wide base inventory is typically determined by the geographical boundary of the community. However, you might need to decide whether to include or exclude incorporated areas, such as a village within a town.

Determining Which Sources and Activities to Include

Local government operations inventories categorize emissions in a different way than community inventories do. This part of the step involves considering and identifying the GHG emissions sources and activities to include in your community's inventory. The following questions can guide you as you identify what to include.

What are sources and activities, and why distinguish between them?

The **sources** of emissions and **activities** resulting in emissions may overlap, and you do not need to decide to include only one type or the other. However, distinguishing between types of emissions can help you better understand, organize, and report emissions associated with your community. See the Important Terminology at the end of this phase for a description of emissions sources and activities.

Communities have identified different types of measures to reduce emissions by distinguishing between sources and activities. This can also help communities avoid double-counting emissions. Emissions associated with either sources or activities alone can generally be summed, but it is important to carefully examine emissions from sources and activities before summing them to prevent double-counting them in the total.

Sources vs. Activities: Materials Management Example

Methane emissions from landfilled organic waste can be accounted for in two ways:

1. **As a source:** Landfills located within community boundaries are considered emissions sources because the landfills physically emit GHGs within the community boundary. These emissions result from all organic waste in the landfill, regardless of where the waste was generated.
2. **As an activity:** Waste generated within the community, even if the waste is landfilled elsewhere, is considered an activity in the community that generates emissions.

Both methods of accounting could be beneficial for developing emissions reduction strategies. Understanding emissions from the in-boundary **source** may highlight opportunities to reduce emissions through changes in landfill management, while accounting for emissions from the waste generation **activity** might help to identify opportunities to reduce emissions through waste reduction programs. However, if waste generated by the community is also landfilled in the community landfill, summing the activity and source emissions could constitute double counting.

What are the possible sources and activities?

Several sources and activities are easier to target in GHG inventories because communities typically have influence over these emissions, data are usually available, these emissions tend to be significant, and they are common in the United States. Examples of these basic emissions-generating sources and activities include:

- Electricity use in the community (activity)
- Fuel use in residential and commercial facilities (source and activity)
- On-road passenger and freight motor vehicle travel (source and activity)
- Energy used to treat and distribute water and wastewater used in the community (activity and sometimes source)
- Generation of solid waste by the community (activity).

Including other "optional" sources and activities provides a more comprehensive image of the community's environmental impacts and areas to target with sustainability projects. You can select sources and activities based on the goals of the inventory and other sustainability programs, data availability, and resource availability. Other tools, such as Table 2 of the ICLEI U.S. Community Protocol, provide lists of other sources and activities.

Step 3. Collect and Compile Data

Having a checklist of your data needs can be useful as you begin collecting data on the sources and activities in your community. When conducting your baseline inventory, you can collect data for all potential base years that are readily available. In Step 5, you will set a base year, but it is often easier to collect data for multiple years at once than it is to go back to collect data for additional years if your needs change (e.g., if certain data are not available for your desired base year).

Data collection can be the most time-intensive step of the inventory process, and it may continue as you begin calculating your baseline.

It is helpful to start by reaching out to utility representatives, transportation planners, and other individuals who may have data, and get a sense of what is and is not available to you. This will help you identify whether you need to make any institutional arrangements in advance to facilitate data collection. For example, utilities' procedures for requesting data may require advance notice. Local governments can establish a Memorandum of Understanding to facilitate data-sharing between organizations, if needed.

Tips for data collection include:

- **Having a single person in charge of the inventory**, an "inventory compiler," who collects data from other organizations, such as from a facilities energy lead or a wastewater treatment lead. This person can keep track of the different components and help build capacity in the organization by becoming an inventory and emissions expert.
- **Minimizing the burden of the data request** and making it easier for someone to give you the information you need. Communities have found it helpful to give data providers a template to populate (such as a spreadsheet with labeled rows and columns) so they understand exactly what you are looking for. However, you may need to take data in whatever form your provider has readily available, for whatever timeframe is available, and then adapt it to your needs.
- **Keeping track of all units of measurement** and following up if the units in a dataset are not clear.
- **Keeping all data organized and carefully documenting all sources of information** (including points of contact for collecting the data). This will make it easier for you or others to collect updated data in the future to measure your progress.
- **Documenting the emission factors and GWPs** used along with the data. It is helpful to have these conversion factors readily available when you are reviewing the data and making comparisons in the future.
- **Considering what data may be helpful in the future**. It is advisable to collect related data if they are readily available, even if you are not sure yet how they may be used.
- **Reaching out to utilities early**. Utilities can be a valuable source of information on community-wide electricity or natural gas use. However, many communities have had difficulty collecting data from utilities because of concerns over data confidentiality or the length of time required to provide the data. You can overcome these challenges by reaching out to utilities early in the process and relying on any existing relationships. You may want to consider coordinating with other communities to streamline data requests.

Table 3 lists a few examples of data that are commonly needed for GHG inventories, along with possible sources of those data.

Table 3. Data Commonly Needed and Possible Data Sources for GHG Inventories for Communities

Data Commonly Needed	Possible Data Source
General	
• Population • Number of households	• U.S. Census Bureau, American Communities Survey
Facilities	
• Electricity use • Residential fuel use, by fuel type (e.g., natural gas, heating oil, kerosene, propane, coal) • Commercial fuel use • Industrial stationary fuel use	• Utilities • Fuel vendors • State-level averages of fuel use per household • EPA's database of GHG emissions from large facilities
• Electricity emission factors	• EPA's eGRID (see regional factors in the "eGRID Summary Tables" file)
• Natural gas emission factors	• Utility (for your community's specific gas carbon content) • LGOP (for national average)
• Fuel emission factors, by fuel type	• Center for Corporate Climate Leadership GHG Emission Factors Hub • LGOP
Transportation	
• Vehicle fuel use, by fuel type • Vehicle miles traveled	• Regional travel demand model • Metropolitan Planning Organization or state Department of Transportation
• Vehicle fuel emission factors, by fuel type	• Center for Corporate Climate Leadership GHG Emission Factors Hub • LGOP
• Off-road vehicle activity	• EPA's NONROAD model
• Flight miles into/out of local airports	• Federal Aviation Administration (FAA) airport statistics
Solid Waste	
• Solid waste generated by community • Composition of waste generated by community	• Solid waste department • Local landfills • Municipal hauler • National, state, or local survey of averages of waste composition or per capita waste generation
Wastewater	
• Wastewater treatment process details (e.g., aerobic, anaerobic, nitrification, denitrification, biogas collected, system BOD_5 load) • Population served by septic systems	• Wastewater treatment manager/department
Industrial Processes	
• Industrial process emissions	• EPA's U.S. GHG Reporting Program database of GHG emissions from large facilities

Step 4. Set Base Year

When choosing a base year, you may want to consider whether:

- Data for that year are available
- The year represents a "typical" year for your community (e.g., no unusual weather or economic conditions)
- The base year is coordinated to the extent possible with any goals or commitments your community may have established (e.g., to reduce emissions a certain percentage below those in a specific year, to align with other community programs, to comply with external requirements).

Your inventory base year provides a benchmark against which you can compare future emissions. Inventories can also be conducted (or simply updated) regularly, in order to track progress.

GHG inventories typically describe emissions over the course of a calendar year for ease of data collection and comparison. Datasets that are available only for fiscal years or other periods can be converted to calendar years.

Step 5. Calculate Emissions

With data collected and a clear vision for which emissions to include, you can calculate emissions for each of the sources and activities identified in Step 2 by plugging your data and emission factors into the appropriate equations. Several resources are available to help with these calculations, including *protocols* that suggest methodologies or equations to use and *tools* that complete the calculations after you enter your data.

For each emissions source or activity, you can choose a methodology for calculating emissions (see Helpful Tips: Approaches to Calculating Emissions). There are multiple methodologies to choose from based on data availability, along with step-by-step instructions, emission factors, and equations for calculating GHG emissions. Tools such as the ICLEI U.S. Community Protocol and the Local Government Operations Protocol can provide ideas, as well as the following from the Greenhouse Gas Protocol:

- Global Protocol for Community-Scale Greenhouse Gas Emission Inventories
- A Corporate Accounting and Reporting Standard
- The GHG Protocol for Project Accounting
- Corporate Value Chain (Scope 3) Accounting and Reporting Standard.

The following tips can also facilitate the calculation process.

Decide whether you want to calculate your emissions using a pre-built tool or your own spreadsheet. Available tools include:

- EPA's Local GHG Inventory Tool: An EPA tool with two modules. The Community Module facilitates the use of the ICLEI U.S. Community Protocol.
- ICLEI's ClearPath: An ICLEI GHG inventory and emissions reduction calculator. ClearPath is free to ICLEI members.

Work through your inventory sector by sector. For each sector (e.g., built environment, transportation, solid waste, wastewater), it is ideal to find the most detailed activity data available and the most locally relevant emission factors. See the Important Terminology at the end of this phase for a description of activity data and emission factors. Possible sources of emission factors include:

- EPA's eGRID and Power Profiler: Electricity use emission factors by region and power plant (eGRID) and by ZIP code (Power Profiler)
- EPA's Waste Reduction Model (WARM): Solid waste emission factors for different material types
- Carnegie Mellon University's Economic Input-Output Life Cycle Assessment (EIO-LCA): Emission factors to estimate the GHG and energy impacts of purchased goods and services.

If "ideal" data or emission factors are not available, think about alternate methods you can use to estimate emissions for each sector. For example, if data on community-wide heating fuel usage are not available, you can use Census Bureau data on the number of homes using each type of heating fuel and the national average heating fuel consumption per household to estimate your community's usage. In addition, you can check other community inventory reports to see if and how they have overcome data gaps.

Match methodology to goals and available resources. The best methodology for a community to use will depend on the goals for the inventory, as well as the amount of time, resources, and data available. Detailed, bottom-up approaches may not be necessary in all cases, such as if your community needs just a high-level, "order of magnitude" estimate of baseline conditions.

Review other GHG inventories. Reviewing past inventories from other communities, your state, and even the Inventory of National GHG Emissions and Sinks can provide inspiration about data sources and emission factors.

Document all assumptions and data sources. It is important to keep detailed records on where you found the data for the GHG Inventory. Where data are not available, you may need to make assumptions. Documenting both data sources and assumptions increases transparency of the process, allows for reproduction of the GHG inventory if needed, and makes future inventories more efficient.

Use other GHG inventories to help you check your results. You can compare your estimated emissions to those of a similarly sized community to check whether your estimates are on the same order of magnitude. It may be most useful to compare estimates on a line-item basis (e.g., only for residential building energy use), as total emissions may be different due to varied factors, including community size, type of electric utility, climate, or different sources included.

Helpful Tips: Approaches to Calculating Emissions

The quantification method and year used for the GHG inventory, as well as the sources and activities you choose to include, will depend on what data are available. Before collecting data, it is helpful to determine what general methodology you will use to complete your inventory. Generally, approaches are either:

- **Bottom-up**: Based on local data about activities in your government (e.g., emissions = natural gas use (derived from utility bills) × utility-specific natural gas emission factor). Bottom-up approaches are preferred for local government inventories.
- **Top-down**: Based on data compiled by a state, regional, or federal agency or office providing information for specific geographic areas. Communities can use this information as part of a proxy methodology to estimate emissions if activity data are not available. For example, a community could estimate natural gas use in the local area based on publicly available information from the EIA and Census Bureau:
  - Number of households in community using natural gas (American Community Survey)
  - Statewide natural gas use (EIA State Energy Data System)
  - Number of households in state using natural gas (EIA Residential Energy Consumption Survey)

$$Natural\ gas\ consumption\ in\ community = Natural\ gas\ households\ in\ community\ x\ \frac{State\ natural\ gas\ consumption}{State\ households\ using\ natural\ gas}$$

The best approach for a community will depend on the goals for the inventory, time and resources available, and data availability. Detailed, bottom-up approaches may not be necessary in all cases, such as if an organization needs just a high-level, "order of magnitude" estimate of baseline conditions. If you decide to pursue a top-down approach, you may be able to spend less time collecting and compiling data, relying instead on state, regional, or national datasets. For example, DOE's State and Local Energy Data provides greenhouse gas emissions, electricity generation, fuel source costs, renewable energy potential, and transportation data for cities across the United States.

Note: You cannot use a top-down approach to measure your progress toward reducing GHG emissions. To measure whether sustainability efforts are working, it is essential to use actual measurements of energy use and other metrics in a bottom-up approach.

Step 6. Analyze and Communicate Results

Analyze Results

Communities have gained valuable "big picture" lessons from GHG inventories. Understanding the driving forces behind emissions can help you answer questions such as:

- What are the largest sources of emissions in your community? What are the activities in your community that contribute most to GHG emissions?
- How do your community's emissions in a source or activity compare to those of other, similar communities? If they are noticeably higher or lower, why?
- What are the drivers for energy use and emissions in your community?
- What are your emissions per capita? Per employee? Per heating degree-day? Per cooling degree-day? See the Important Terminology for a description of degree-days.

Continuing to monitor emissions over the course of the project (e.g., by regularly tracking key data such as energy use or conducting an inventory every year or two) will allow you to evaluate progress. Visit the Track and Report phase for more information.

Communicate Results

It is important to communicate the results of your inventory to community members and to others within the local government. Communities have found it helpful to *tell a story* about their energy use, emissions, and monetary savings, rather than simply reporting the numbers. For example, you could explain that the community has relatively low electricity use compared to other communities, but gets electricity from a fuel source with higher carbon intensity. In subsequent years, you can tell the story about what is driving trends in your community's emissions (e.g., energy efficiency efforts, economic growth, population change, weather). You can look at other inventory reports for inspiration and visit the Engage and Communicate phase for more information on communicating inventory results. Key stories might highlight:

- How cost-saving energy activities have impacted local residents
- Areas where the community has significant influence to make changes
- Activities of interest to the community, regardless of its local government's influence
- Household-level emissions that might inspire residential behavior change.

One way to tell your community's story is to use EPA's GHG Equivalencies Calculator, which translates GHG emission amounts into terms that are more easily understood. For example, the calculator translates metric tons of carbon dioxide equivalent into more relatable terms, like "annual emissions from X number of cars."

You may also want to consider reporting your emissions through the Carbon Disclosure Project cities program.

Important Terminology

Activity Data
Defined by the Intergovernmental Panel on Climate Change (IPCC) as "data on the magnitude of human activity resulting in emissions or removals taking place during a given period of time," activity data are the primary pieces of information needed to calculate a GHG inventory. Examples of activity data include the amount of electricity used or vehicle miles traveled in a calendar year.

Degree-Days
A unit of measurement that compares the outdoor temperature in a time period to a standard of 65°F. Degree-days are useful for comparing energy use across periods with different weather conditions. In GHG inventories, they can help determine how much of a year-to-year change in emissions was caused by weather instead of other factors. (You can learn more from the U.S. Energy Information Administration.) The lessons learned from the local government's inventory can inform emissions and energy use reduction efforts. See the Set Goals and Select Actions phase for more information.

Direct vs. Indirect Emissions
GHG emissions of local government operations can be categorized as **direct** or **indirect**.

- **Direct emissions** in government operations inventories are from sources located within the local government's organizational boundaries and that the government owns or controls (e.g., emissions from a municipally owned landfill).
- **Indirect emissions** occur because of the local government's actions, but at sources outside the local government's operational control (e.g., emissions from municipal waste sent to a privately owned landfill).

Emission Factor
An emission factor defines the quantity of emissions per unit of fuel or activity. Emissions are calculated by multiplying activity data by the emission factor. For example, emissions from fuel oil combustion are calculated by multiplying gallons of fuel oil used (the activity data) by emissions per gallon of oil (the emission factor). Default emission factors are readily available for many activities; some can be found in the LGOP. Emission factors differ for electricity in different parts of the country and for different kinds of fuel oil or natural gas.

Global Warming Potential (GWP)
The Global Warming Potential (GWP) was developed to allow comparisons of the global warming impacts of different gases. Specifically, it is a measure of how much energy the emissions of 1 ton of a gas will absorb over a given period of time, relative to the emissions of 1 ton of carbon dioxide (CO_2). The larger the GWP, the more that a given gas warms the Earth compared to CO_2 over that time period. The time period usually used for GWPs is 100 years. GWPs provide a common unit of measure, which allows analysts to add up emissions estimates of different gases (e.g., to compile a national GHG inventory), and allows policy-makers to compare emissions reduction opportunities across sectors and gases. (You can learn more from the EPA's Understanding Global Warming Potential).

Sectors
The LGOP identifies the following local government sectors, which can also be used to categorize emissions: buildings and other facilities, streetlights and traffic signals, water delivery facilities, port facilities, airport facilities, vehicle fleet, transit fleet, power generation facilities, solid waste facilities, wastewater facilities, and other process and fugitive emissions.

Important Terminology, continued

Scopes
The LGOP uses "scopes" to categorize emissions based on their source. Three scopes together provide a comprehensive account of GHG emissions:

- **Scope 1**: All direct GHG emissions (e.g., emissions from heating oil use in city buildings, gasoline consumption in city vehicles, city-owned wastewater treatment plants).
- **Scope 2**: Indirect GHG emissions resulting from electricity use. Scope 2 may also encompass emissions from purchased heating, cooling, or steam.
- **Scope 3**: All other indirect emissions (e.g., emissions resulting from the extraction and production of purchased materials and fuels, contracted solid waste disposal or wastewater treatment, employee commuting and business travel, outsourced activities).

Scopes have historically been used in community inventories as well, although with mixed results.

Sources vs. Activities

- Emissions **sources** are any physical processes at locations inside the jurisdictional boundary that directly produce GHGs. They can be thought of as "stack pipe" or "tail pipe" emissions and result in GHGs that actually enter the atmosphere within the physical boundaries of your community. Examples include burning of coal to generate electricity at a power plant, the use of fuel oil in residential homes, vehicles driving within the community, industrial facilities, solid waste disposal facilities, wastewater treatment facilities, and domesticated livestock production within the community.
- **Activities** refer to any uses of energy, materials, or services by community members that result in emissions, regardless of where the emissions occur. Examples include electricity use, home heating and cooling, air travel by members of the community, solid waste generation, water use, and the purchase and use of materials. These activities are under the direct control or influence of residents and businesses within the community and may result in emissions originating either inside or outside the community's borders. Activities that generate emissions originating within the community boundary (e.g., driving a gas-powered vehicle within the community, heating a home with oil) can be considered both a source and an activity.

See the Materials Management Example above for an example of an emissions source versus an activity.

Examples from the Field

Delaware Valley Regional Planning Commission (DVRPC): Regional GHG Inventory
Regional GHG inventory allocating emissions across each of the region's nine counties and 352 municipalities, conducted for 2005, 2010, and 2015.

City of Creve Coeur, Missouri: Baseline GHG Inventory
The 2014 GHG inventory for both local government operations and community emissions in a 16,868-person city, including suggested items to reduce emissions.

King County, Washington: GHG Inventory
GHG inventories for 2000, 2003, 2008, 2010, 2015, and 2017 including government operations and community emissions. Community emissions are reported using two different accounting: "geographic-plus" and "consumption-based" inventories; however, the most recent framework in 2017 is an update to the geographic-plus inventory only.

Chicago, Illinois: 2015 GHG Inventory
2015 community-wide inventory that includes community and local government operations emissions for the City of Chicago and tracks progress against a 2005 base year.

GHG Inventory for the City of St. Louis
2015 community-wide inventory for the City of St. Louis and tracks progress against a 2005 base year.

GHG Inventory for the City and Santa Fe and Santa Fe County
2015 community-wide inventory for the City of Santa Fe, Santa Fe County, and the Santa Fe Metropolitan Planning Area.

Tools and Templates

EPA's Local GHG Inventory Tool
An EPA tool with two modules that help users calculate local government operations and community-wide GHG inventories, respectively, by facilitating data collection and compilation, and generating summary reports.

EPA's ENERGY STAR Portfolio Manager
A no-cost, interactive energy management tool that allows you to securely track and assess energy and water consumption across your building portfolio.

Facility Level Information on Greenhouse Gases Tool (FLIGHT)
An EPA tool to explore GHG emissions from large facilities around the United States, including by location, process, industry, gas, or facility.

EPA's State Inventory and Projection Tool
An EPA tool designed to help state governments calculate GHG emissions, with 11 source-based modules. Although it is designed for states, local and tribal governments can use the tool by entering local activity data.

EPA's Tool Finder for Local Government Clean Energy Initiatives
A search tool that helps local government staff screen tools and resources designed to measure impacts of clean energy programs and policies.

ICLEI's ClearPath
A tool that helps users analyze the benefits of emissions reduction measures and track emissions progress over time. ClearPath is free to ICLEI members.

Further Reading

Inventory of U.S. Greenhouse Gas Emissions and Sinks
A national GHG inventory report providing background information and estimation methodologies for all U.S. emissions sources.

Quantifying the Multiple Benefits of Energy Efficiency and Renewable Energy: A Guide for State and Local Governments
Guidance on quantifying the environmental, health, and monetary benefits from energy efficiency and renewable energy projects.

EIA State Energy Data System
National database of energy use, prices, expenditures, and production by state, energy source, and sector with data for every year since 1960.

Local Government Operations Protocol
Information on how to conduct a GHG inventory for local government operations, including equations and methodologies, default emission factors, and guidance on reporting emissions.

ICLEI U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions
Guidance on calculating and reporting community-wide GHG emissions, including equations, methodologies, and default emission factors.

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Set Goals and Select Actions

Setting goals can guide and frame choices at all phases of project planning, implementation, and evaluation. Communities have found that clearly articulated goals can help develop effective projects, communicate the intent of the projects to the public, and select specific actions to help meet those goals. Thinking about goals early on can help ensure that a project is cohesive, well-designed, appropriate for the community, and proactive rather than reactive.

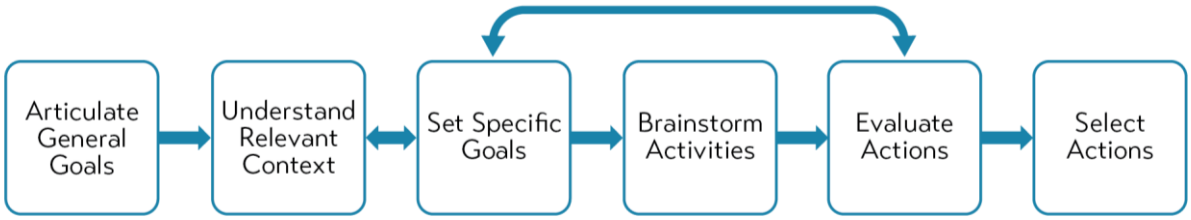
The steps presented in this phase can help users articulate the goals for their energy and environment projects and identify actions that are most appropriate to help meet those goals. Goals can be wide-ranging and cover many areas, including clean energy, GHG emissions, and resilience, as well as economic development, job creation, air quality, environmental justice, or other local priorities.

Key Steps

This phase outlines several key steps that are likely to be part of this process, as presented in Figure 5. The steps are not necessarily intended to be pursued in linear order, and they may require multiple iterations, as shown in the diagram. The exact steps for setting goals and selecting actions will likely vary by community.

As an example, a community may first decide on a *general goal* to improve its energy efficiency. After doing some research to *understand the relevant context*, the community may set a more *specific goal* to reduce energy usage in community buildings from a previous benchmark. Then, the community may move toward *brainstorming* and *evaluating actions* such as upgrading light fixtures at public facilities, adopting a new code that supports energy efficiency retrofits or upgrades, or sponsoring a community energy reduction challenge.

Figure 5. Overview of the Key Steps for Setting Goals and Selecting Actions



Step 1. Articulate General Goals

The first step of any effort is to articulate, at a high level, what you are trying to do. Do you want to reduce emissions? Increase your community's resilience to extreme events? Reduce energy use? Save money? Are you focusing on a particular sector or market segment (e.g., energy, transportation, solid waste; residential, commercial, industrial)?

Even if your general goals seem obvious to you, articulating them ensures that everyone is on the same page. Writing down goals will help you communicate them to your stakeholders and can also help as staff transition or new people join your team. You may have one goal or several goals. If you have more than one goal, you may want to consider prioritizing them so that everyone agrees on which goal is most important.

Step 2. Understand Relevant Context

Before setting more specific goals, it is helpful to understand where your community stands relative to your general goals. Communities have found that researching the relevant context can help to articulate reasonable, appropriately ambitious goals; identify actions to build on; and ensure that decisions are fully informed and deliberate. Some questions you might consider as you conduct research include:

- What is already happening in your community related to these goals? Are specific activities underway? Are there relevant plans and priorities (see Helpful Tips: Building on Existing Work)?
- Are there legal or regulatory limits or constraints on what you can do?
- Are there high-level policies (e.g., at the state level) that relate to your general goals?
- How will this effort relate to other community plans (e.g., comprehensive plans, land use plans, long range transportation plans) and economic goals (e.g., new economic activity in disinvested communities, lower energy costs for low- and moderate-income families and small businesses, and job creation)?
- What are communities around the country or in your region doing to accomplish these goals? Are there opportunities for joint projects and collaboration?
- Have related efforts or projects been attempted in the past? If so, what lessons can you draw upon?
- Are there any local experts in the area who have done research or implemented relevant initiatives that could help shape goals and activities?
- Are there data or information available to help you better understand or support the goals?
- Are there any complementary projects underway (e.g., led by a non-profit or work in environmental justice communities) to be aware of and coordinate with? Or, are there other initiatives or efforts that will compete for scarce resources and attention?
- What is the path to adoption or implementation for this effort?
- What are the priorities of political leadership? And, what are the priorities of the general public?

Helpful Tips: Building on Existing Work

Old community plans, documents from previous administrations, and documents that are otherwise outdated may be "hidden gems" of institutional knowledge. You can review these documents for ideas and insights about whether these specific ideas have been pursued in your community previously.

As you work to understand context and inform goal-setting, it is helpful to gather input from all potential stakeholders—including decision-makers, community members, and experts—who may contribute to or be affected by the project. You may want to consider bringing together these stakeholders through a series of informal meetings or a more structured committee, task force, or other group, depending on the scale of your effort. You can work with them to review or contribute to this background research effort, and engage them throughout the remaining steps to articulate goals and select and evaluate actions. Engaging stakeholders early and often can increase community participation and support, identify potential barriers, reveal relevant activities or opinions, and ultimately increase the likelihood of success.

Step 3. Set Specific Goals

After conducting background research, it is time to develop specific goals. It is helpful to make these specific goals as quantitative as possible in order to track and report your progress.

Setting more specific goals may be dictated by outside factors. For example, the mayor of your town or city might dictate a specific goal, or there may be a state or regional mandate, regulation, or policy to comply with. Minnesota's Next Generation Energy Act, for example, established a legally required, statewide GHG emissions reduction goal. As a result, local goals for emissions reductions might aim to meet or exceed the goals established by the state.

If no outside factors dictate your goals, the following tips may help you articulate goals that are both reasonable and appropriately ambitious.

Be Organized

- *Keep goals concise and to the point*. Limiting each specific goal to a single sentence makes it easier to understand and follow. For example, the Tompkins County 2020 Energy Strategy clearly states an emissions reduction goal of at least 2 percent each year.
- *Consider developing high-level goals in this phase*. For example, the City of Northfield, Minnesota, adopted a high-level goal of 100 percent carbon-free electricity by 2030 and being a 100 percent carbon-free community by 2040. Then, as part of the Track and Report phase, you can develop more specific interim targets.

Be Ambitious and Reasonable

- *Strive for a reasonable number of goals*. The appropriate number of goals may scale with the size of your community and the magnitude of the effort. What level of resources can your community realistically devote to pursuing the goals? It is best to avoid taking on more than you can handle.
- *Aim to strike a balance* between goals that are ambitious and goals that are attainable. Well-crafted goals inspire people to take action without intimidating them. This can take several forms: each goal can strive to find that balance, or you can use a mix of ambitious and attainable goals. As you work to strike this balance, you may want to start evaluating potential actions to determine what actions

are feasible (see Step 5). You can also refer to other communities for examples. Miami-Dade's GreenPrint Plan lays out several aspirational goals that are both ambitious and attainable.

- *Other communities have found it helpful to set nearer-term, incremental, or smaller-scale goals* as milestones toward the end goal to help track progress. If all goals feel too far off, the community may not be motivated or inspired to reach them. For example, Greenworks Philadelphia developed an overarching goal for each of its five sustainability lenses—energy, environment, equity, economy, and engagement—and then developed measurable targets to reach the goal. Tracking specific targets and metrics can happen later in the process (see the Track and Report phase for more information). At this stage, it is primarily important to be aware that you may want to set these targets and identify tracking metrics in the future.
- *If you identify actions already taken toward a goal, you can think of them as "early wins."* You do not need to eliminate a goal just because action has already been taken to achieve it.

Be Concrete

- *While qualitative goals can be beneficial, quantitative goals are often the most useful*. Aim to make goals as measurable, concrete, and verifiable as possible. For example, consider framing goals for sustainability efforts in terms of emissions reductions, energy savings, cost savings, or jobs created.
- *Where possible, include a specific timeframe for achieving goals*. If goals are relative (e.g., a percentage reduction in emissions, energy use, or costs), you can articulate a base year for comparison. It is best to be clear about units of measurement.

Once you have identified your goals, it is helpful to write them down in a formal, public document or in an informal, internal document, depending on your situation.

Step 4. Brainstorm Activities

With your specific goals articulated, you can begin brainstorming actions you might take to achieve those goals. Actions tend to fall within three major categories: changes in internal government operations, policies, and projects to increase participation within the community. The Take Action phase has additional information and sources of ideas for specific actions in each category. At this stage in the process, you may just want to determine which category of action you want to pursue, or you may want to select specific actions. In any case, it is best to be all-inclusive as you brainstorm. You can narrow your options in Step 5 and Step 6.

As you brainstorm actions, you may want to consider reaching out to all members of the community and stakeholders, including expert advisors and the general public, for a more complete list of ideas. For example, when reaching out to business leaders, you can consider all types and sizes of businesses from all parts of town in addition to the town's "marquee" businesses.

Local academics, business leaders, and the general community can be sources of creative ideas. If you choose to gather their input, it is best to avoid promising that you will implement all suggestions. In addition to consulting stakeholders, you may want to consider the following resources for ideas:

- EPA's Local Government Strategy Series provides ideas for local governments related to energy efficiency, transportation, community planning and design, solid waste and materials management, and renewable energy.
- Climate change action plans, or related actions adopted by other communities.
- Actions taken by local governments—see N.C. State University's Database of State Incentives for Renewable Energy (DSIRE) or the Sustainable Cities Institute for some examples.

It is helpful to keep a list of potential actions and the goals they can help achieve. From there, you can evaluate the options and decide which to pursue.

Step 5. Evaluate Actions

If the initial list of actions to pursue is too long, you can systematically review the actions to rule out those that might not be appropriate to pursue in the near term. Depending on the number of actions you want to evaluate, you can do this in two steps: a qualitative screen and a detailed evaluation.

Qualitative Screen

First, you can undertake an initial screen of the actions identified based on key criteria, such as their general benefits and costs (or pros and cons); technical, economic, and political feasibility; and alignment with community goals (see Helpful Tips: Screening Process). There may be helpful information for this qualitative evaluation from the same sources where you identified the action. You can also use professional judgment to identify which actions are likely to be the most cost-effective and have the broadest community support. It is best to choose a limited number of criteria to consider at this stage.

You could conduct this screen internally or in coordination with stakeholders through community meetings, by using a website to collect feedback or votes, or by using a team exercise for collaborative screening. If the success of your selected actions depends on community involvement, it is especially important to involve the community in the selection and development process to establish community support early. It may also be advantageous to gather input from community members tasked with implementing the actions, as they are likely to have informed ideas about what actions may be feasible.

This high-level screen may be sufficient to move on to implementation. However, you may want to conduct a more detailed, quantitative evaluation.

Helpful Tips: Screening Process

You may want to create a matrix to help with the action screening process. For example, you can set up each action as a row and each criterion as a column, then assign a qualitative ranking (e.g., High/Medium/Low or Good/Bad) in each cell. You can color-code and filter the responses to see which actions to eliminate or describe as low priority, and which to keep for further evaluation, as needed.

Examples of Potential Actions	Cost	Benefit	Feasibility	Alignment with Other Goals
Replace City Hall lights with LED	Moderate	Moderate	High	High
Reduce city fleet by 50 vehicles	Low	High	Moderate	Moderate
Install 1-megawatt solar project	High	High	Moderate	High
Incentivize hybrid taxis	Low	Moderate	Low	High
Weatherize homes	Moderate	High	Moderate	High
In this example, green indicates a good quality, such as high feasibility, whereas red indicates a bad quality, such as high cost.				

The qualitative screening process does not need to be overly burdensome. You may not need to fill out every box for every action. This just represents one way of systematically thinking through the relative promise of a variety of potential options for your community, in terms of their ability to meet your goals, as well as your ability to successfully implement them.

Detailed Evaluation

After an initial screen, you may want to perform a more in-depth evaluation to identify a short list of specific actions, specific sectors to target, or the best approach to use. Criteria may include:

- Potential to reduce vulnerability to extreme weather events
- Multiple benefits or costs for the public and private sectors
- Relevant institutional capacity
- Measurability
- Economic efficiency
- Legal constraints
- Social equity
- Political impact and feasibility
- People or households affected
- Alignment with other community goals (e.g., jobs, air quality)
- Enforceability
- Public support.

Several tools are available to help local governments evaluate the costs, benefits, and emissions reduction potential of different actions. For more information about these tools, see the Tools and Templates section. You may also want to consider reviewing other communities' plans to learn how they identified and evaluated specific strategies. Some good Examples from the Field are listed at the end of this phase.

Step 6. Select Actions

Based on the evaluation in Step 5, you can determine which actions or broader categories of actions you intend to pursue or investigate further. Additional information on specific actions and ways to evaluate alternatives are available as part of the Take Action phase.

It is best to select actions that are reasonable and achievable, ambitious and inspirational. It is also a good idea to identify a reasonable number of actions that correspond to the resources your community can devote to the project. Depending on the community, having a high number of actions may actually curtail your ability to implement them, simply because the to-do list is overwhelming.

Documenting your decisions on which actions to pursue is important. Depending on your situation, this may be an internal document or a formal, public document like a sustainable energy action plan. Listing the lead organizations responsible for moving actions forward in your plan can help create accountability and is one way to make the plans more realistic and likely to be accomplished (see Helpful Tips: Implementation Actions).

Action checklists can carry forward the momentum from the goal-setting and action evaluation processes. Checklists can help assign individual responsibility for actions and break down the process into achievable steps.

Helpful Tips: Implementation Actions

At this point, some local and tribal governments might take initial implementation actions. For example, a city council could pass a resolution endorsing selected actions as a show of support. This helps lock in momentum leading to the next steps, like obtaining resources.

Next steps may include obtaining resources to implement actions; developing a plan to track and report progress; or beginning to implement the actions selected.

Examples from the Field

Tompkins County, New York: 2020 Energy Strategy
Plan adopted in 2010 to achieve the county's goal of reducing GHG emissions 80 percent below 2008 levels by 2050. The plan includes the estimated GHG emissions savings, scale, timeline, financial feasibility, and technical needs for several measures. Tompkins County provided updates on their plan in August of 2019.

Chicago, Illinois: Climate Action Plan
Plan that outlines goals, actions, and detailed methodologies to evaluate possible actions within five primary strategies: energy-efficient buildings, clean and renewable energy sources, improved transportation options, reduced waste and industrial pollution, and climate change adaptation.

Philadelphia, Pennsylvania: Greenworks Philadelphia
Plan that includes five overarching goals, 15 specific targets, and a third tier with specific initiatives to achieve the plan's targets.

City of Urbana, Illinois: Climate Action Plan
Plan that articulates five overarching goals, 15 actions to achieve those goals, and the approaches used to estimate the actions' benefits.

Miami-Dade County, Florida: GreenPrint Plan
Plan that outlines several aspirational goals, specific targets under each, strategies to achieve each target and goal, and a plan for tracking progress.

Portland, Oregon: Climate Action Plan
Plan that incorporates equity objectives throughout sections of the plan (e.g., Buildings and Energy, Transportation) based on suggestions from an Equity Working Group. Equity-focused objectives, metrics, and strategies are notated in the document with a symbol.

OneNYC
New York City's sustainability and resilience blueprint, originally known as PlaNYC. OneNYC includes information on goals, targets, and strategies across a range of sectors, including housing and neighborhoods, brownfields, public health, food, green buildings, energy, air quality, and others.

Tools and Templates

EPA's Tool Finder for Local Government Clean Energy Initiatives
A search tool that helps local government staff screen tools and resources designed to measure impacts of clean energy programs and policies.

EPA's Estimating the Health Benefits per-Kilowatt Hour of Energy Efficiency and Renewable Energy
Set of values to help state and local governments estimate the outdoor air quality-related public health benefits of investments in energy efficiency and renewable energy.

EPA's Waste Reduction Model (WARM)
Tool to help solid waste planners and organizations compare emissions from baseline and alternative waste management practices, such as source reduction, recycling, combustion, composting, and landfilling.

EPA's Avoided Emissions and Generation Tool (AVERT)
Tool to estimate the emissions benefits of energy efficiency and renewable energy policies and programs.

EPA's CO-Benefits Risk Assessment (COBRA) Health Impacts Screening and Mapping Tool
Tool to estimate the health and economic benefits of clean energy policies that reduce or avoid air pollution. The tool can help state and local governments calculate the value of clean energy policies like energy efficiency.

ICLEI's ClearPath
Tool that helps users analyze the benefits of emissions reduction measures and track emissions progress over time, among other features. ClearPath is free to ICLEI members.

Community Action Planning for Energy Efficiency (CAPEE)
Tool that helps users prioritize steps to reach their energy efficiency and carbon reduction goals. This preliminary tool uses a questionnaire to provide recommendations and a downloadable action plan.

Further Reading

EPA's Local Government Strategy Series
A suite of guidance documents for local governments on topics like energy efficiency, transportation, community planning and design, solid waste and materials management, and renewable energy.

EPA's Quantifying the Multiple Benefits of Energy Efficiency and Renewable Energy
A resource for states, this guide helps state energy, environmental, and economic policy-makers identify and quantify the multiple benefits of clean energy.

EPA's WaterSense Partnership Program
Resources and information on best practices for sustainable water management in the commercial and institutional sector.

NACo's Emerging Sustainability Strategies in America's Counties
Resource developed by the National Association of Counties (NACo) on actions counties can take in pursuing sustainability programs.

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Obtain Resources

Planning, implementing, and evaluating energy and environmental projects requires various types of resources. Resources could be monetary or non-monetary, such as existing staff or volunteers, or advertising, meeting spaces, or equipment readily available to your community. Some projects may require new resource streams, while other projects may be implemented by reprogramming existing resources, generating and using fees, or using cost savings.

The steps presented in this phase can help you identify and secure resource streams needed to support a variety of projects and programs.

- The **Obtain New Resources** approach aims to help communities that have identified a project but need new resources to start or complete the project.
- The **Take Advantage of Available Resources** approach aims to help communities that want to take advantage of newly released resources to support an existing project.

As with the rest of this document, this phase is geared toward the project level, but the information provided may also be relevant for programs or policies.

Resources may include funding or financing mechanisms from different sources. Funding and financing mechanisms are similar, but **funding mechanisms** (such as grants) are typically distributed free of charge, while a **financing mechanism** (such as a loan) requires repayment and typically includes interest. Organizations and institutions that provide funding or financing are referred to as **sources**. Table 4 lists possible sources for funding and financing for local projects; these sources are not necessarily for local government operations. Table 5 lists different types of funding and financing mechanisms.

Table 4. Potential Sources of Funding and Financing

Source Type	Description of Source	Suggestions for Accessing Source
Internal funding	The *operating budget* of the city, county, or community organization. Obtaining internal funding may require budget reallocation or additional appropriations.	Staff can speak with appropriate representatives to learn about the requirements and process for accessing internal city, county, and organizational funding.
Government funding	Federal, state, and local governments offer grants and loans to local and community organizations based upon their eligibility.	Local and community organizations can check with federal, state, and local governments for opportunities to fund energy and environmental projects. You may be able to find federal funding sources on Grants.gov.
Private foundations	Charitable organizations sometimes provide grants or other funding, such as low-interest program-related investments, for projects that support their mission.	Foundations can be identified through online research and usually have online application processes. Some foundations have rolling applications or specific calls for applications at certain times of the year.
Green banks	Green banks are financial institutions that can leverage public funding to attract private capital for clean energy and environmental projects, and other green investments.	EPA published a paper on green banks including a description, benefits, and case studies. The National Renewable Energy Laboratory (NREL) provides a list of green banks in the U.S., their banking products, and additional resources. The non-profit Coalition for Green Capital also provides a list of green banks and other resources, and the Green Bank Consortium is an organization for green banks, capital providers, developers, and other clean energy supporters.
Utilities	Utilities offer financial incentives and technical assistance to reduce energy use and peak demand. These include general rebates and incentives, as well as demand response and load management programs, and are typically paid for by utility rate payers.	DSIRE provides information on potential incentives at the state level.

Table 5. Potential Types of Funding and Financing Mechanisms

Mechanism	Description	Suggestions for Accessing Mechanism
Funding Mechanisms		
Power Purchase Agreements	Power Purchase Agreements (PPAs) are long-term contracts between public, private, and non-profit entities (the customer) and a renewable energy (RE) generator (the seller) to purchase renewable electricity. There are two types of PPAs: Physical PPAs and Financial PPAs.	EPA's Guide to Purchasing Green Power provides additional information about Physical and Financial PPAs. EPA also published a paper on Solar PPAs including a description and benefits. PPAs differ depending on the state where you live. It is advisable to research how to obtain a PPA in a state before making any investments and contact the state government for resources and information.
Grants	Government grants are available from local, state, or federal agencies, including local utilities or metropolitan planning organizations. Grants are also provided by private foundations. Grants likely have reporting requirements depending on the governing body.	Federal grants are all listed on Grants.gov, and state grants can often be found on state webpages. Local and private foundations grants can be more difficult to locate and might involve calling local environment or foundation offices for more information.
Direct incentives	Government agencies and utilities often offer a variety of tax credits, rebates, and other incentives for purchasing clean energy technologies. For example, the Solar Investment Tax Credit is in effect until 2022 for residential and commercial solar systems.	By offering tax incentives and rebates, governments and utilities can encourage consumers to purchase new RE and energy efficiency (EE) technologies that can be expensive. Check DSIRE for potential incentives at the state level.
Financing Mechanisms		
Revolving loan fund	A revolving loan fund (RLF) involves designating a pool of money to issue loans for projects and using the resultant loan payments to fund subsequent projects. Establishing an RLF may require partnering with a bank to manage the loans.	There are private and government-sponsored RLF programs; government programs typically offer lower rates and flexible terms. According to DOE, more than 30 states offer RLFs for EE and RE projects, and some local governments also sponsor RLF programs.
Community solar projects	Community solar projects are owned by multiple members of the same community, and the members either receive electricity supply from the solar project or financially benefit from the sale of the electricity. The most common financing models are utility-sponsored, on-bill crediting, special-purpose entity, and the "buy a brick" model, where donors contribute to the shared renewables installation owned by a charitable or a non-profit organization.	NREL developed a guide for those interested in starting community solar projects. DOE explains the three financing options for community solar projects on its community solar website.
On-bill financing and repayment	On-bill programs are a unique method of financing energy projects in which the utility bill is used as the vehicle for repayment. The programs are sometimes designed so that the monthly repayment costs are less than the amount saved by the investment.	Utilities might offer an on-bill financing program or work with a third party that offers on-bill refinancing. To see if a utility offers an on-bill program, contact the utility directly. EPA published a paper on on-bill programs including descriptions, benefits, and case studies. DOE has resources for learning more about these funding mechanisms.

Mechanism	Description	Suggestions for Accessing Mechanism
Energy efficiency mortgages	Energy efficiency (EE) mortgages allow home buyers and commercial entities to finance additional funds on top of the buildings' purchase price. The additional funds are used to make EE building or home upgrades such as double-paned windows or insulation.	Home buyers can choose from three types of EE mortgages: Conventional, Federal Housing Authority, or Veterans Administration EE mortgages. ENERGY STAR provides resources for those interested in applying for EE mortgages. Home buyers can also talk about EE mortgages with loan officers.
Energy performance contracting	Energy performance contracts are typically designed to deliver monthly energy savings at least equal to the monthly finance payments for energy improvements. Energy service companies may offer energy service performance contracts (ESPCs) or energy service agreements (ESAs).	DOE provides resources for facility owners to learn more about obtaining federal financing for ESPCs.
Credit enhancements	Credit enhancements are anything the borrower can do to assure the lender that the funds financed will be repaid. Some enhancements include loan loss reserve, loan guarantees, interest rate buy-down, loan loss insurance, debt service reserves, and subordinated/senior capital structures.	Local and state government agencies can establish a credit enhancement fund or program to absorb loan risk and encourage private lenders to provide attractive loans. DOE provides a listing of potential credit enhancements on their website.
Renewable energy and energy efficiency project loans/ leases	Government agencies may offer loan opportunities for energy or environmental projects. Local governments can also be recipients of these loans. *Loans* require repayment, which may come from an ongoing revenue stream. These loans are intended to cover the upfront costs of EE or RE equipment. *Leases,* which can be provided by government agencies and private solar companies, allow customers to use EE and RE equipment without purchase. The most common leases are on-balance sheet capital leases and off-balance sheet operating leases.	DOE provides resources for customers interested in leasing EE and RE equipment and also provides a list of resources for those interested in purchasing EE and RE technology, vehicles, and components. For example, the City of Fayetteville, Arkansas, partnered with Ozarks Electric Cooperative and Today's Power Inc. to provide low-cost clean energy to the city for wastewater treatment plants. The solar PV systems are provided by the solar companies, and the city leases the land to the companies. In return, the solar companies sell electricity back to the city at a below-market rate.
Green bonds	Green bonds are similar to other municipal (muni) bonds, but their proceeds must be used for green projects including clean energy investments or sustainability-focused projects.	The International Capital Market Association provides resources on green bond principles, green project mapping, and green bond guidance handbooks. The Climate Bonds Initiative offers the Climate Bonds Standard, which details eligibility criteria for climate bonds and green bond projects. The Natural Resource Defense Council issued the Green Muni Bonds Playbook, which details the different types of green muni bonds, how projects qualify for green bonds, and how to issue green muni bonds.
Property Assessed Clean Energy programs	Property Assessed Clean Energy (PACE) programs provide loans that are repaid through building owners' property tax assessments. PACE programs help property owners finance the upfront costs of installing clean energy technologies.	C-PACE is a program designed for commercial properties. DSIRE provides a searchable database of states and cities that offer residential PACE programs.

Obtain New Resources

Key Steps

This section of the Obtain Resources phase will help communities that have identified a project but need new resources to start or complete the project (see Helpful Tips: Types of Resources). While the exact process for obtaining resources will vary by project, Figure 6 shows the typical steps in the process. You may not need to complete all the steps.

Figure 6. Overview of the Key Steps for Obtaining New Resources to Complete a Project

Helpful Tips: Types of Resources

Local governments often draw upon non-monetary resources to plan, implement, and evaluate energy and environmental projects. For example, non-profit organizations can be a source of technical expertise to set up programs or execute projects. Non-profit organizations can also obtain all or part of their funding from private sources and help complete applications for public and private grants. Public private partnerships (PPPs) can also provide technical support or directly pay for a portion of the project. Typically, local governments or communities may partner with private organizations, and both parties benefit from the completed project.

Step 1. Define the Project

This step will help you define the scope, duration, and type of project you intend to pursue. Considering these characteristics of the project can help you determine the resources you need.

Scope of the Project

Defining the scope can help you articulate the project so that all stakeholders understand what is involved in the project and can help you obtain adequate resources to support the project. Defining the scope requires input from all stakeholders, including identifying any stakeholder's interests in the project (e.g., affordability or environmental protection).

Duration of the Project

Estimating project duration allows you to articulate the appropriate resources needed to complete your project, as discussed in Step 2. Projects can take longer and be more costly than you planned for. In addition, project or contractual requirements (such as reporting requirements) may continue after the project or contract period ends. You may want to consider including a buffer in your timeline to account for unexpected delays.

Specific Activities You Plan to Undertake in the Effort

Visit the Set Goals and Select Actions phase for help defining the specific activities planned for the project. It is important to account for secondary activities, such as training or planning meetings. To clearly understand and identify the activities you will need to undertake, it is helpful to think about the end goal of the project and work backwards.

Step 2. Articulate Needed Resources

Once you have defined the project, you can articulate the resources you need to be successful. You may want to consider the types, amount, and timing of resources you need as outlined below.

Types and Amounts of Resources

Consider the following categories of resource needs:

- **Technical expertise:** What types of expertise will you need, such as financial or contracting expertise; expertise in renewable energy, energy efficiency, or green roofs; stakeholder inclusion experts? Does someone on your staff have this expertise? (See the box describing use of external support for additional information.)
- **Staff time:** How much staff time will be required? What points during the project will require additional time? Will the identified staff be available if the project is delayed? Will the project require new staff?
- **Stakeholder participation:** What level of participation is needed and from whom? How can you engage stakeholders early in the process? How do you ensure all stakeholders are included? See the Engage and Communicate phase for more information on stakeholder engagement.
- **Other direct costs:** What are the other costs that you might need to plan for to achieve the project goals? For example, do you anticipate needing equipment, advertising, and meeting space or contractor support and other services?

Visit the Tools and Templates section for examples of tools that can help you articulate needed resources.

Use of External Support

You may not need external resources if the project can be completed using existing staff, equipment, and supplies within the regular work week and within the existing available budget. You also may not need external resources if the project requires minimal staff time and any additional costs will be offset through savings. However, external resources may be necessary if staff are not available within the anticipated project duration, if you need an outside expert, or if you need support for other direct costs. For example, you may wish to **engage community leaders** who can contribute technical expertise, offer a different perspective, or act as a trusted voice in engagement and outreach. These leaders have established relationships with community members and may be more in tune with the needs of the community. This is especially helpful in historically underrepresented communities or communities that have specific needs, such as neighborhoods where residents speak a language other than English or do not have a lot of interaction with the local government. When considering resource needs, you may want to consider compensating community organizations for their support in the same way that you would expect to compensate a consultant or other entity you engage.

Resource Timing

Once you understand the duration of the project, you can consider what resources are required for start-up activities versus long-term operational activities. Common start-up costs included equipment and supplies; communications and market research; licenses and permits; insurance; and employee salaries, if additional staff is required to implement your project. Some costs will be well-defined (e.g., permits), while others may only be estimates. You may also want to consider how long resources will be needed. Some costs are one-time expenses (e.g., licenses and fees, initial construction of an energy or environmental project), while others occur on a monthly or weekly basis. Multiplying the expected monthly budget can help you predict expenses over time, while considering additional costs such as maintenance.

Step 3. Identify Potential Resources

Table 4 lists possible sources for funding and financing for local projects, and Table 5 lists different types of funding and financing mechanisms. Resources from a number of different sources can be used together to cover the cost of a project. For instance, a community interested in energy efficiency may receive a grant that funds one year of staff time and initial equipment upgrades, while energy savings can be captured and reinvested in the project to pay for subsequent staff time and equipment costs. When combining multiple funding and financing sources and mechanisms, there may be limitations and restrictions on how the funds can be combined due to reporting requirements, and more staff time might be required to effectively manage multiple funding streams.

In addition, some communities have had success by creatively exploring a variety of opportunities and options for funding. For example, you could obtain **technical expertise** by collaborating with an academic institution or community leader, or by seeking assistance from other departments within your own organization or an external agency. **Staff time** may be allocated by rearranging existing staff responsibilities, hiring additional staff or contractors, or recruiting interns or volunteers. Partners and community groups can help increase **stakeholder participation,** and partnering with them may open access to otherwise restricted resources.

Finally, you may also want to consider your community's administrative capacity or expertise to manage project funds, leverage of other projects and funding sources, and limitations to funding, as outlined below.

Administrative Capacity and Expertise to Effectively Manage Project Funds

Managing funds can be complex and time-intensive. When identifying resource needs, you may want to consider the staff time needed to administer the project. If staff time and expertise are limited, it is useful to consider whether reporting requirements are especially cumbersome or fall during busy times of the year. However, if either your organization or your partners have a large operating budget, adequate staff capacity, and expertise to comply with requirements, you may want to consider resources with a high level of required reporting and tracking. You can ask the organization providing funding if they offer training resources on how to comply with their administrative requirements for reporting.

Leverage of Other Projects or Funding Opportunities

Other activities in the community and state may affect your proposed project resources. For example, your proposed project may not be eligible for certain funding sources given other ongoing efforts. If you encounter this issue while sourcing funding, you may want to consider partnering with other projects or organizations. You may be able to work collaboratively with an existing project or organization to source new funding that can expand their project scope and increase your eligibility for funding. After Arkansas passed legislation that allowed for the creation of energy improvement districts that would be authorized to implement PACE programs, for example, the City of Fayetteville created the first PACE program. Neighboring Springdale also wanted to implement a PACE program; however, there was not enough of a market for

energy efficiency projects in their city alone, so they asked to join the Fayetteville PACE district. Together, the two cities have a larger pool of potential EE projects that can benefit from PACE financing.

In addition, partnering with a Small Disadvantaged Business or a Veteran- or Women-Owned Small Business may allow you to be eligible for a more diverse set of funding opportunities. Working with these organizations may help you bolster community support, and together make a stronger case for accessing funding. These businesses might be able to take the lead in applying for funding on behalf of the project if you develop a partnership.

Limitations to Potential Sources

Certain community characteristics can affect the types of resource streams you pursue. For example, do you have sufficient public support for increased tax revenue or fees? Does your community limit borrowing above a certain dollar amount? Are there funding streams with restrictions that might help or hinder you, such as a funding stream geared toward small communities or focused on vulnerable populations?

In addition, if the funding source has a different fiscal year from that of your community or organization, you may want to discuss any potential issues with the appropriate decision-makers and financial staff before you pursue the funding opportunity.

Featured Resource: Local Program Model Design Guide

EPA developed the Local Program Model Design Guide to help local resilience and clean energy program implementers create or transition to financially viable and self-sustaining program designs. This flexible, adaptable model takes an in-depth look at three focus areas:

- **Creating value** for target audiences to generate adequate program revenues
- **Developing effective partnerships** that leverage each partner's strengths to enhance value and create new opportunities
- **Delivering program services** that meet the target audiences' needs, align with organizational strengths and resources, and generate enough revenue to cover costs.

The guide describes lessons, examples, and resources derived from the experience of more than 50 local climate and clean energy programs around the country. It also provides simple worksheets and techniques for analyzing and refining program models.

Step 4. Select Appropriate Sources

Once you have identified potential funding sources, you can use your organization's or community's decision-making process to determine if the funding source is appropriate for the project. If you do not have an existing process, you can start by considering how the resource stream and project fit with other ongoing activities. It is important to look for opportunities for collaboration and address any conflicts your organization or community may have with the potential funding sources. The questions below can guide you in selecting appropriate sources of funding and financing mechanisms.

- Are you eligible for the identified resources? If not, are there eligible partners who can take the lead in applying for funding on behalf of the partnership?
- Do the resources available cover the project's needs, including its full scope and duration? If not, can you develop a sufficient long-term funding plan with supplementary resources, such as existing staff time or other resource streams? Or can you scale back the original project vision to fit the available resources?

- Do the goals of the resource stream align with the goals of the community and the project? Will the project activities benefit a group of community members equitably? If not, can you refocus the project so it aligns with the goals of the resource stream without contradicting the community's goals? Is there a vibrant, diverse stakeholder group that would support the project or devote time to the project activities?
- Do you have the capacity to meet application deadlines? Is the capacity required to apply for the resources reasonable? Could you partner with another community or organization that would lead the application process?
- If you do obtain the resource, do you have the internal capacity to comply with any resource requirements (e.g., reporting)? Could you partner or contract with an organization that would take on the reporting requirements?
- Do you have or can you obtain resources for any additional costs not covered by the available resources (e.g., operation and maintenance costs, pre-contract activities, post-contract activities)? Is your community willing to cover the additional costs?
- Are there any legal implications, restrictions, or limits associated with the available resources (e.g., borrowing limits, debt ratios) at the city, county, or state level? If so, are you able to comply with or overcome them? It is a good idea to discuss legal concerns or limits with appropriate decision-makers and legal staff.
- What is the level of competition or political risk? If you apply, is there a high likelihood that you will be awarded the funds or resources given the competition? If the resource requires a vote by a governing body, is there public support to pass the measure? Is it worthwhile to invest the time or resources to pursue the resource option given the likelihood of success?

Step 5. Pursue Resources

How you pursue the selected resources will depend on the specific funding source, funding mechanism, or financing mechanism you identify. However, for all resources, you may want to consider:

- **Establishing a team** from among your existing colleagues or partners to help you pursue and secure the resources.
- **Complying with applicable internal processes** at your community or organization.
- **Satisfying the application, loan, or financing requirements**. It is important to clearly articulate how the proposed project advances the purpose, goals, and intentions of the resource stream. Satisfying the requirements includes making sure that any required forms and appendices are included and labeled correctly. It is a good idea to contact the organization providing the resource to ensure that you are meeting all requirements. Often you can request training or a consultation for this purpose.
- **Understanding your competition**. Where applicable, you can better frame your own application and increase your chances of success by keeping in mind the strengths and weaknesses of your known and potential competitors.
- **Re-engaging key stakeholders** at all levels of community leadership, such as representatives of underserved communities, to ensure sufficient interest and approval and to engage them early in the process. Visit the Engage and Communicate phase for more information.
- **Asking questions.** This might include reaching out to similar communities (e.g., similar in size) that have used this type or amount of resources before, or contacting the funding agency to clarify requirements.

Take Advantage of Available Resources

Key Steps

These steps will help you take advantage of a newly released resource stream, such as a funding announcement, summer intern, or unexpected budget surplus. Figure 7 outlines key steps that are likely to be part of the process, although the exact process will likely vary by project and community.

Figure 7. Overview of the Key Steps for Obtaining Newly Released Resources to Complete an Effort

Step 1. Make a "Go/No-Go" Decision

When a newly available resource is announced, a first step is to consider if it fits with your resource needs. The following questions can help you determine whether to pursue the resource further.

- Are you eligible for the identified resources? If not, are any of your partner organizations eligible? Some types of funding are reserved for particular groups; for example, a non-profit organization, a Small Disadvantaged Business or a Veteran- or Women-Owned Small Business. If you are working with partners who qualify, they may be able to take the lead in applying for funding on behalf of the partnership.
- Do the resources available cover the project needs, including full scope and duration? If not, can you develop a sufficient long-term funding plan with supplementary resources, such as existing staff time or other resource streams? Or can you scale back the original project vision to fit the available resources?
- Do the goals of the resource stream align with the goals of the community and the project? If not, can you refocus the project so it meets the goals of the resource stream without contradicting the community's goals?
- Do you have the capacity to meet application deadlines? If not, could you partner with another organization that would lead the application process?
- If you do obtain the resource, do you have the internal capacity to comply with any resource requirements (e.g., reporting)? Could you partner with or contract to an organization that would take on the reporting requirements?
- Do you have or can you obtain resources for any additional costs not covered by the available resources (e.g., operation and maintenance costs, pre-contract activities, post-contract activities)? Is your community willing to cover the additional costs?
- Are there any legal implications, restrictions, or limits associated with the available resources at the city, county, or state level, such as borrowing limits or debt ratios? If so, are you able to comply with or overcome them? It is a good idea to discuss legal concerns or limits with appropriate decision-makers and legal staff.

- What is the level of competition or political risk? If you apply, is there a high likelihood that you will be awarded the funds or resources given the competition? If the resource requires a vote, will you be able to generate the public support to pass the measure? Is it worthwhile to invest the time or resources to pursue the resource option given the likelihood of success?

Step 2. Develop a Plan and Gather Support

Once you decide to go after a new resource stream, you can develop a plan for using the resources and begin gathering support to develop your resource plan.

Visit the Set Goals and Select Actions phase to develop a plan for a project to use the resources. Alternatively, it may make sense to apply this new resource stream to an existing project. It is a best practice to align the project scope and schedule with the characteristics and requirements of the available resources. These characteristics include the amount of funding available, the timing of resource availability, the purpose of the resource stream, and any requirements associated with use of the resources. After accounting for the main resource stream, you can fill in any resource gaps with a plan for acquiring supplemental resources.

Visit the Engage and Communicate phase for more information on gathering support and participation from key stakeholders in the community, political leaders, and partners. You may want to consider engaging key stakeholders, including representatives of vulnerable populations, in the development of your resource plan.

Step 3. Pursue Resources

How you pursue the selected resources will depend on the type of available resource. However, when pursuing resources, you may want to consider:

- **Establishing a team** from among your existing colleagues or partners to help you pursue and secure the resources.
- **Complying with applicable internal processes** at your community or organization.
- **Satisfying the application, loan, or financing requirements**. It is important to clearly articulate how your proposed project advances the purpose, goals, and intentions of the resource stream. Satisfying the requirements includes making sure that any required forms and appendices are included and labeled correctly. It is a good idea to contact the organization providing the resource to ensure that you are meeting all requirements. Often you can request training or a consultation for this purpose.
- **Understanding your competition**. Where applicable, you can better frame your own application and increase your chances of success by keeping in mind the strengths and weaknesses of your known and potential competitors.
- **Re-engaging key stakeholders** at all levels of community leadership, such as representatives of underserved communities, to ensure sufficient interest and approval and to engage them early in the process. Visit the Engage and Communicate phase for more information.

- **Asking questions.** This might include reaching out to similar communities (e.g., similar in size) that have used this type or amount of resources before, or contacting the funding agency to clarify requirements.

Additional Funding Opportunities

You may want to consider subscribing to EPA's State and Local Energy Newsletter, DOE's Energy Efficiency and Renewable Energy Newsletter, or to a grants database. Some grants databases require a membership fee.

To search for available funding opportunities, visit the following websites:

- EPA's Combined Heat and Power Partnership Policies and Incentives Database (dCHPP)—allows users to search for combined heat and power policies and incentives by state or at the federal level.
- EPA's Landfill Methane Outreach Program Funding Guide—includes information on programs available to provide financing or incentives for landfill gas energy projects.
- EPA Grants Resources—lists open announcements for EPA grants.
- EPA's State and Local Transportation Grants and Funding Opportunities—provides links to federal funding sources available to state and local agencies for projects related to transportation and air quality.
- EPA's National Clean Diesel Campaign Funding Opportunities—describes and links to funding sources related to the national clean diesel campaign.
- DOE's Clean Cities Financial Opportunities—describes financial opportunities for Clean Cities projects to reduce petroleum use in transportation.
- DOE's Alternative Fuels Data Center Laws and Incentives Database—allows users to search for federal and state laws and incentives for alternative fuels and vehicles, air quality, fuel efficiency, and other transportation-related topics.
- HUD/DOT/EPA's Partnership for Sustainable Communities Grants, Assistance, and Programs—provides links to funding-related resources relevant to the partnership.
- USDA's Rural Energy for America Program—provides financial assistance to agricultural producers and rural small businesses for various renewable energy and energy efficiency efforts.
- DSIRE—provides information on incentives and policies that support renewable energy and energy efficiency in the United States.
- Grants.gov—provides a centralized location for grant seekers to find and apply for federal funding opportunities.

Examples from the Field

City of San José, California: Energy Fund
A case study describing how a $4 million Energy Efficiency and Conservation Block Grant was leveraged to provide ongoing support for energy efficiency and renewable energy projects at municipal facilities.

Using Qualified Energy Conservation Bonds to Fund a Residential Energy Efficiency Loan Program
A policy brief from the Laurence Berkeley National Laboratory describing how Saint Louis County, Missouri, issued $10 million of these bonds to finance its SAVES residential energy efficiency loan program.

Virgin Islands Energy Alliance Program
A case study from the National Council for Public-Private Partnerships about how the U.S. Virgin Islands established a public-private partnership to explore alternatives for energy conservation and renewable energy generation.

Tools and Templates

EPA's Tool Finder for Local Government Clean Energy Initiatives
A search tool that helps local government staff screen tools and resources designed to measure impacts of clean energy programs and policies.

EPA's Clean Energy Finance Tool
A tool to assist state and local governments interested in developing or revising a financing program to support energy efficiency and clean energy improvements for large numbers of buildings within their jurisdictions.

ENERGY STAR Cash Flow Opportunity Calculator
A Microsoft® Excel tool that estimates how much new energy efficiency equipment can be purchased with anticipated savings; compares financing options for energy efficiency purchases; and evaluates project economics under different interest rates.

DOE's Pay for Energy Initiatives
A U.S. Department of Energy resource that provides overview of financing for state, local, and tribal governments for lead-by-example in public facilities and investment in private buildings.

DOE's Clean Cities Financial Opportunities
A U.S. Department of Energy portal to funding opportunities related to the reduction of petroleum consumption in transportation.

Further Reading

EPA's Local Government Strategy Series
A suite of guides that provides an overview of local government emissions reduction strategies. In each guide, Chapter 7 presents information about costs and financing opportunities.

EPA's Clean Energy Financing Programs
A Decision Guide for States and Communities to help governments understand and make decisions to support appropriate renewable energy financing programs for their jurisdiction.

EPA's Green Banking Strategies for Local Governments
A primer that describes green banks, the benefits they offer, issues local governments might consider when deciding whether to create a green bank, and several case studies.

EPA's Local Program Model Design Guide
A guide that covers value creation and program revenues as well as creation of effective partnerships.

EPA's On-bill Programs for Local Governments
A primer that describes on-bill programs, the benefits they offer, issues local governments might consider when establishing an on-bill program, and several case studies. EPA also hosted an on-bill financing webinar.

Revolving Loan Funds
Best practices for state and local officials published by the National Renewable Energy Laboratory for establishing and working with revolving loan funds.

How to Develop and Write a Grant Proposal
A Congressional Research Service report that provides an introductory overview of how to write a proposal for government and private foundation grants.

DOE's Commercial PACE Working Group
A cohort of state and local governments to leverage knowledge and develop tools for PACE finance programs.

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Take Action

The Take Action phase offers guidance and resources about how to implement actions for one of three types of local government efforts.

- **Promote Green Government Operations** includes efforts to make government-managed infrastructure, operations, and investments more sustainable and resilient.
- **Adopt a Policy** allows communities to use new or updated rules, regulations, ordinances, laws, or plans to spur action.
- **Engage the Community** involves actions that promote voluntary measures by residents and businesses or encourage behavior change.

This phase focuses on the key steps in designing and implementing actions that fall under each of these categories, including key questions to consider and how to avoid or overcome common challenges. In addition, this phase includes steps on engaging with the community, setting goals, and obtaining resources. The "Case in Point" boxes provide an example of how one town for each type of local government effort used the steps outlined in this guidance document to effectively design and implement green government operations, adopt a policy, or engage the community.

EPA's Local Government Strategy Series also provides details on designing, implementing, and evaluating projects in different sectors.

Take Action: Promote Green Government Operations

"Green" government operations minimize a local government's environmental impact, including its energy use, water use, waste and pollution generation, and GHG emissions. Local governments have found that promoting green government operations achieves substantial cost savings, demonstrates energy and environmental leadership, develops local municipal capacity and expertise, and raises public awareness.

Promoting green government operations might include:

- **Increasing energy efficiency.** For example, conducting an energy audit and efficiency upgrades at city hall, designing new city facilities to earn the ENERGY STAR, and installing a revolving door in high-traffic entrances. Programs like ENERGY STAR provide interactive tools to help local governments manage and track energy and water consumption to document increased energy efficiency.
- **Using alternative energy.** For example, using solar panels to power parking meters, purchasing renewable energy certificates to offset electricity use in government buildings with renewable energy resources.
- **Reducing waste.** For example, purchasing office kitchen items such as coffee and tea in bulk, introducing composting receptacles in staff kitchens, and replacing individual trash bins with desk-side recycling bins.
- **Encouraging greener transportation choices.** For example, incentivizing staff use of public transportation or carpools; purchasing electric or hybrid vehicles for the local government fleet; providing bike racks, showers, and locker rooms for government employees who ride to work.
- **Implementing sustainable land use decisions.** For example, locating public services near transit options, limiting the number of parking spots required for public buildings.
- **Increasing the resilience of government assets** and reducing the heat island effect through government infrastructure. For example, installing green infrastructure at government facilities, such as green and cool roofs, rain gardens, cool and permeable pavements; and paving roads and parking lots with permeable and more resilient materials when possible.

PROMOTE GREEN GOVERNMENT OPERATIONS

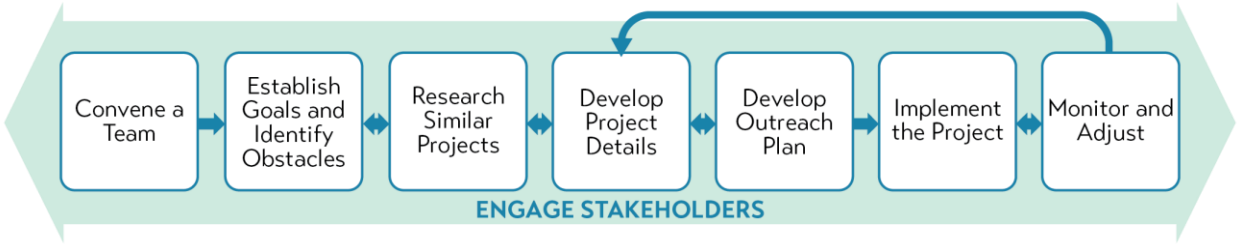
- Convene a Team
- Establish Goals and Identify Obstacles
- Research Similar Projects
- Develop Project Details
- Develop Outreach Plan
- Implement the Project
- Monitor and Adjust

The following key steps focus on developing projects to make changes to government operations. Information on adopting a policy in the form of a plan, ordinance, regulation, or other mechanism to mandate sustainable actions is covered under Adopt a Policy. Projects related to encouraging the adoption of voluntary actions in the community are covered under Engage the Community.

Key Steps

These steps describe how a community can design and implement green government operations. As illustrated in Figure 8, these steps are not necessarily intended to be pursued in linear order. For example, the "establish goals and identify obstacles" step and the "research similar projects" step may happen simultaneously. In addition, stakeholder engagement occurs throughout all steps of the process and is integrated into each of the step descriptions.

Figure 8. Overview of the Key Steps for Designing and Implementing Green Government Operations



"Case in Point" boxes provide an example of how one town—in this case, the Town of Preble, New York—effectively designed and implemented a project to encourage green government operations using the steps outlined below. Use the arrows to navigate between "Case in Point" boxes for the Town of Preble.

Step 1. Convene a Team

To effectively design and implement green government operations, you may want to consider whether your efforts would benefit from a leadership or support team. It is helpful to ask:

- Is the level of effort large or complex, or are there a variety of stakeholders such that the project would benefit from a cohesive leadership or support team?
- Could existing teams or venues fulfill this role (e.g., ongoing departmental meetings, stakeholder groups for ongoing planning processes)?
- Are you or your stakeholders facing any time constraints that would either make it difficult to work with a large team or imply a need to compress the schedule by using extra resources?

If you determine that a leadership or support team would be beneficial, the following questions will be useful to keep in mind when forming the team.

How large should the team be? Should the team include people only within my organization? What role should each team member play?

The size of your team is an important consideration. A larger team may be more representative; a smaller team may be more efficient. Potential stakeholders and individuals have various attributes and strengths in offering valuable input and support, leadership, and unique experiences or perspectives.

It is also useful to identify the key people or partners who can help you build a better, stronger project, as well as to articulate your goals, help create buy-in, and ensure that your goals are realized over the course of the project. These may include inspired staff members, community leaders, an existing *green team*, specific departments within the government, a facility that has identified an opportunity to make a change, or private organizations. It is helpful to include leaders who represent key populations within your community, especially those with specific needs or who may be underrepresented. For example, Fayetteville, Arkansas, has a standing Environmental Action Committee to address environmental concerns, research climate mitigation policies, and recommend policies that encourage energy efficiency efforts. The Committee consists of a City Council member, a local industry member, a scientific representative, and eight residents at large.

Can you partner with other communities or a regional organization to reduce the resources required to promote green governance?

Neighboring communities or regional organizations can be partners in the effort. Partnerships can reduce the resources required from your community and can also impact sustainability or resilience on a broader scale. You may want to consider meeting regularly with staff members from a group of communities to exchange ideas, share resources, and track progress. It is worth noting that working with this kind of formal, multi-jurisdictional group can be time-intensive.

Visit the Engage and Communicate phase for specific guidance on how to engage with potential project partners.

Case in Point

In 2010, the Town of Preble, New York, (population ~1,300) was awarded a grant to conduct an energy efficiency upgrade for the town hall. The grant was one of seven competitive $30,000 matching sub-grants awarded to municipalities to address climate change by the Central New York Regional Planning and Development Board (CNY RPDB) through EPA's former Climate Showcase Communities grant program.

While preparing the grant application, local government officials recruited participants to sit on an advisory committee responsible for project implementation. The committee included a representative from the local department of public works, the town judge, and a resident who worked for the facilities department at a local state college and was familiar with the heating systems. This dedicated group worked closely with the CNY RPDB staff to find viable solutions for the town. Preble's leaders found that it was essential to identify a group of trusted local project stewards because the project was introducing the community to new and unfamiliar technology. Without the foundation of a trusted advisory committee, it is likely that this project would have ended prior to completion.

Step 2. Establish Goals and Identify Obstacles

Before initiating a project, you may want to consider defining an explicit purpose, including defining what you are trying to accomplish. Are you trying to decrease operational costs, reduce government emissions, or provide an example that citizens or businesses can adopt? Do you have a specific goal, such as GHG reduction, waste diversion, or urban heat island reduction? Goals help serve as a guide or focal point throughout the project.

The specific, quantifiable goals you develop will depend on the components of the project. For example, you might have an internal outcome (e.g., energy use reduction) and an external outcome (e.g., the number of businesses that learn about the project). Visit the Set Goals and Select Actions phase for more detailed guidance on articulating specific goals.

As you establish goals and identify obstacles, it is a good idea to assess how the project may affect different segments of the community in different ways, including the variable distribution of benefits and burdens. In addition, success metrics can account for equity by measuring who benefits and setting targets for equitable distribution of benefits. Disaggregated equity data (e.g., race, income, participation in existing programs and services) can help you find service gaps. For example, Seattle City Light voluntarily participated in a regional effort to assess populations who have been underserved by energy efficiency programs and used the results in their We Power Seattle Strategic Plan.

As you conceptualize the project, you may want to consider the amount and types of available and potential resources, including funding and staff time. Visit the Obtain Resources phase for guidance on how to obtain necessary resources.

Case in Point

The opportunity for Preble, New York, to receive technical support from CNY RPDB inspired the town to pursue a project to encourage green government operations. Preble was interested in financial savings and starting a sustainability project, but did not know where to start.

Preble and CNY RPDB evaluated the town's needs and identified two potential projects: (1) replacing the Department of Public Works' garage, and (2) conducting an energy efficiency retrofit for the town hall.

An initial assessment revealed that updating the town hall, which had been built in 1906, would provide immediate benefits, including financial savings and relief from drafty windows and noisy in-wall air conditioning units. The retrofit also provided an opportunity to replace the antiquated fuel oil heating system with a high-efficiency heat pump system, which had the added bonus of reducing GHG emissions.

Preble took advantage of a program supported by the New York State Energy Research and Development Authority that offers small commercial and home energy assessments. The town had a local HVAC contractor perform a "blower door test" to identify air leaks. This assessment revealed that the building's air exchange was 12 times higher than it should have been for a building that size. This helped define the explicit need for an energy efficiency upgrade that included air sealing and insulation.

Step 3. Research Similar Projects

Prior to implementing a new initiative, your community will benefit from surveying ongoing efforts both internally, for complementary or competing projects, and externally, to look for other organizations that may be implementing similar projects.

Understand Local Efforts

Are related projects happening in your area (see Helpful Tips: Making Projects Locally Applicable)? Can you partner with or build on existing networks and projects? It will be helpful to find out if non-profits, academic institutions, or other departments within city government are researching or working on similar projects. You can ask the people who led those initiatives what considerations and obstacles they had to overcome and how they achieved success. You may be able to combine your efforts or otherwise collaborate with existing projects.

Learn from Others

Other communities that have taken on similar initiatives can also offer unique insights. For example, you can look at the Institute for Sustainable Communities' Knowledge Center for examples of regional climate action, clean energy cities, and community-driven resilience. You can ask your counterparts about what worked well and any advice they have for your initiative.

Helpful Tips: Making Projects Locally Applicable

Although it is valuable to learn from others, it is important that the project be locally applicable. For example, a campaign to increase government employee use of public transportation may not be feasible in a town that has limited bus service. A plan to coordinate carpools and add bike racks in front of city hall may be a more effective way to decrease single-occupancy vehicle trips to work.

Case in Point

Heating technology had greatly advanced since the 1970s renovation of the Preble, New York, Town Hall, when a fuel oil system was installed. As the town was considering retrofits to the Town Hall, CNY RPDB encouraged the town to consider comprehensive solutions using new technologies, such as a heat pump system that would address heating and cooling issues together. However, the town was not familiar with alternative heating options and the viability of renewable energy systems such as solar panels. In particular, decision-makers were not confident that a heat pump system would be sufficient for severely cold days.

Through work with CNY RPDB and a local contractor who participates in the ENERGY STAR certification, project leaders learned about heating options that were proven to be more sustainable and cost-efficient than heating oil. This included conversations with experts to answer questions about the viability of solar energy systems in Upstate New York and a tour of a ski resort that had successfully installed a heat pump system.

Through this research, Preble was able to consider new ideas and integrate solar panels to amplify the financial and GHG reduction benefits of the project. CNY RPDB and the contractor provided the project's advisory committee with options that included the integration of renewable energy. A detailed evaluation of the options revealed an anticipated return on investment in a little more than 6.5 years. This made the large initial investment much more attractive. After one year of operation, an updated evaluation lowered the estimated return on investment to 5.8 years.

Step 4. Develop Project Details

Once you have convened a team, defined your goals, and conducted research on existing efforts, you can identify specific activities and actions that best suit your community's needs. You may be able to replicate or expand an existing project, or you might synthesize a combination of successful elements from various projects or develop an entirely new project.

As you develop the details of your project, you may want to consider the following elements:

- **Scope.** What is the scope of the project, and what are explicit milestones for implementation? Is a phased implementation or a pilot project appropriate given the available resources and capacity of the leadership team?
- **Location.** If you need to select the project site, it is important to justify the selection. Assessing the feasibility of a project site may involve an environmental assessment (EA) or an environmental impact statement (EIS). An EA is a concise document that reviews the impacted environment. An EIS is a comprehensive document that requires an assessment of the cumulative impacts of a project along with all other future development nearby. For more information, see EPA's Environmental Impact Statement Filing Guidance.
- **Implementers.** It is advisable to hold conversations with key stakeholders, including "implementers," to identify and address concerns early. For example, if the project involves changes in building operations or custodial practices, the facilities manager or head custodian can offer their expertise on the facility. See the Engage and Communicate phase for more information about engaging stakeholders.
- **Audience.** Who will be affected by the project or should know about the efforts and successes of the project? Does the audience report to a county or state government? Is the ultimate audience the taxpayers? Is the audience made up of citizens and business owners? Have you engaged audiences from all neighborhoods? Seeking to understand the motivations of your audience and engage them appropriately will benefit the project.
- **Equity.** What will be the impacts of the project on various communities? Are you receiving insights from all neighborhoods and from multiple perspectives? Does your project build future capacity in underrepresented communities? Does your project increase equity in a short-term or continuous timespan? It is important to support long-term relationships with underrepresented communities to establish trust and continued engagement.
- **Synergy.** Does the project fit into and complement other community plans? For example, does this project support an existing transportation or stormwater initiative? How can this new effort further the effectiveness of or complement existing projects?
- **Process.** What is the process an action would need to follow? For example, if it requires legislation, what is required to get the bill or resolution through city council?
- **Legal considerations.** Have you obtained necessary permissions and approvals? The project needs to comply with all applicable local, state, and federal laws.
- **Resources.** Will sufficient resources be available for the full project duration, including maintenance requirements and ongoing implementation? You will need to define and secure needed resources (see the Obtain Resources phase).
- **Timeline.** Does the timeline that you have developed for the project take into account staff availability and capacity?
- **Tracking and reporting.** Have you developed a plan to measure, report, and evaluate quantifiable metrics? Guidance from the Track and Report phase can help you identify the appropriate metrics.

Case in Point

Scope: The energy efficiency project to upgrade the Preble, New York, town hall included a blower door test, air sealing and insulation, installation of an air-source heat pump system, installation of vinyl windows, upgrade to an efficient lighting system, and installation of solar panels on the roof. All elements of the project were sized to work together and integrated, which resulted in dramatic increases in efficiency and comfort in the town hall.

Location. The town hall is one of two government-operated public buildings in Preble, New York, and the team determined that this would be the most effective use of the sub-grant from CNY RPDB.

Implementers. The project team worked with CNY RPDB staff and a local engineer to identify the appropriate scope and bid documents. The heating and cooling system and the solar panels require little-to-no maintenance, and both are covered by two-year warranties on hardware and installation.

Audience. The ultimate audience for this pilot project was the general public and neighboring towns, which could be inspired by the project to implement similar upgrades. These community members and other local decision-makers were engaged through public meetings.

Synergy. This project was part of a larger community effort to reduce GHG emissions. As part of their participation with CNY RPDB, Preble developed a GHG inventory and completed a sustainability action plan.

Legal considerations. Due to the building's age, the project team had to confirm that it was not designated a historic building and that the solar panels and window upgrades would not violate any historic designations. Because the building was not designated as historic, there were no such restrictions. However, the building does have historic community value, and the project team decided to locate the solar installation on the back side of the building to limit the aesthetic impact of the project.

Resources. Preble was able to piece together financial assistance from several sources. With a $30,000 grant from EPA's former Climate Showcase Communities program, the town was able to leverage additional funding, take advantage of incentive programs, and justify a reallocation of town resources that had been collected for another project. The 6.5-year return on investment also helped convince decision-makers that this was a wise investment. The total cost of the project was approximately $136,000, and the town was able to secure assistance for more than half of the cost.

Very early in the project, it seemed that the financial hurdles would prevent the project from moving forward. Preble worked with CNY RPDB to evaluate the long-term value of the project and decided to increase the town's spending from $30,000 to $49,000. As a result, the city was able to leverage enough funding from multiple sources to make the project a reality.

Tracking and reporting. The project had two major areas of performance that can be measured: energy produced by the solar panels and energy used by the building. Although the town did not set up a specific tracking system, these metrics are readily available, and the town is able to track the project's success through these measurements.

Step 5. Develop an Outreach Plan

You may want to consider developing an outreach plan to publicize your efforts and successes so that you can demonstrate how the project will add value to the community. Even if the project is not focused on inspiring others, an outreach plan can assure taxpayers that the project is beneficial. Below is an overview of tasks involved in developing an outreach plan. The Engage and Communicate phase has more information on communicating with stakeholders and the public that you might want to include in an outreach plan.

- **Identify a spokesperson.** This involves selecting an individual or group to be the face of the project. For example, would the mayor or municipal manager be an appropriate person to make announcements about the project? Would it be helpful for multiple city council members to make a joint announcement? Who can best communicate the value of the project to the community? Engaging community leaders, elected officials, and community champions as appropriate can raise the project's visibility.
- **Select an approach.** What is the best method or combination of methods to spread the word about the project? Possible methods include traditional media, such as local newspapers; social media, such as Facebook, Twitter, and blogs; local networks and leaders; and local events. You may want to consider how announcements are typically made in your community, and how different stakeholders receive information. For an example of effective use of social media, visit the Central New York Energy Challenge Facebook page. In addition, you may want to consider which department or position will be responsible for outreach, including reporting on performance metrics after the project is over, if relevant.
- **Identify what you will report.** Which metrics will you report publicly? Some communities have chosen to communicate reductions in relatable terms such as the "number of mature trees preserved" or other tangible measurements. For example, you might consider tracking energy, dollars, and carbon dioxide emissions saved through a city hall retrofit. Useful metrics convey the value the project adds to the community. You may want to consider consulting stakeholder groups to see what those groups would like to measure and report. Different groups may be interested in different types of metrics. You can use EPA's GHG Equivalencies Calculator to translate abstract emission amounts into more meaningful measurements. See the Track and Report phase for more information on reporting metrics. It may also be beneficial to conduct other types of reporting; for example, on community attitudes toward clean energy or recycling. This can be done in a variety of ways, such as a poll question on your local government website's homepage. You can also encourage people to share stories of how they have been impacted by environmental decision-making.
- **Develop a reporting schedule.** How often will you publicize metrics? Will you post monthly updates on financial and resource savings? Is an annual or biannual report sufficient?
- **Set goals.** Other communities have found it helpful for the outreach goals and metrics to be separate from the goals and metrics for the project itself.

Case in Point

Preble, New York, held town board meetings and gave public presentations to share information about the project. Once the local contractor conducted the blower door test and research revealed the potential cost savings that could result from retrofitting the heating system, the leadership team used this information to gain project support. The town wanted to see a project that could be justified financially and that would improve conditions in the community building, which was cold, loud, expensive to heat, and uncomfortable in the winter.

The project also gained interest from neighboring jurisdictions. In addition to providing residents with a local example of the value of air sealing and insulation, the project demonstrated that heat pumps and solar energy are both viable in Upstate New York. The solar panels have caught the attention of curious pedestrians.

As a result of this project, the board member on the leadership team became an outspoken champion of the project and installed a 9-kW solar system on her own house. Although a formal outreach strategy was not explicitly developed, the results of the project were highly visible and tangible—people in the town who use the building can actually feel the difference the improvement has made, since the building is no longer as loud or drafty. In addition, a Preble Town Hall Photovoltaic (PV) System Profile is publicly available online.

Step 6. Implement the Project

Implementation will likely require some variation of the following steps:

- **Acquire materials**. Your organization's procurement policies and procedures can guide your acquisition of needed project materials (e.g., new windows or light bulbs, recycling bins, reusable materials). For example, you may need to develop a request for proposals (RFP) and select a vendor from competitive bids.
- **Engage staff**. If you have the capacity to do the work in-house, you can identify the staff and resources necessary to complete the project. Alternatively, you may want to consider contractors or volunteers, especially trusted community leaders. Community engagement often extends to those who are already involved with or have access to projects.
- **Conduct the project**. Actual project implementation will involve installing infrastructure, rolling out incentive programs, adjusting operational protocols, engaging your stakeholders, or completing other necessary steps.
- **Track progress**. Visit the Track and Report phase for information on understanding project progress and success.
- **Communicate progress and successes**. Following the steps of the outreach plan outlined in Step 5, if appropriate, will allow you to communicate your progress and successes.

As explored in Step 4, implementing an incremental rollout or starting with a pilot project may be appropriate.

Case in Point

The energy efficiency upgrade at the Preble, New York town hall took nearly two years to implement. Several hurdles extended the project's duration:

- Prior to this project, Preble had performed a commercial building energy assessment. However, due to the building's size and type of construction, it was determined that a residential assessment was more appropriate because it also considered insulation needs. This proved to be a critical decision in the success of the project given the need for insulation.
- Public projects require consensus among local government departments and the public.
- The heat pump and solar panels were innovative solutions that had not been tested in Preble. Additional research and efforts were required to reach agreement between decision-makers and the public.
- Preble had to acquire several sources of funding to fund the project.

One lesson that Preble learned was how to evaluate solar panel bids. For most municipal contracts, the "lowest qualified bid" is selected. However, Preble decided to take a more comprehensive approach to assess the bids. The evaluation criteria considered the size of the panels, manufacturing location, and qualifications of the installer.

Step 7. Monitor and Adjust

Tracking the metrics identified in Step 5 over the course of the project will allow you to measure progress and make adjustments as needed. You can receive feedback by facilitating ongoing conversations with stakeholders. You can collect and analyze outcome data and communicate results and lessons learned to the community. Would your community benefit from continuing to collect the metrics after the project concludes?

Visit the Track and Report phase for more information on how to develop an effective process to collect and analyze data, and report on project outcomes.

Case in Point

Preble, New York, conducted an assessment of the town hall building's history to measure the impact of the energy efficiency upgrades to the building. The town is measuring both **energy consumption** and **energy generation**.

Energy consumption is measured by the amount of energy (in kilowatt-hours (kWh)) used and the associated cost. The projected annual savings from the project was approximately $8,000. At the end of the first year of operations, the energy efficiency improvements outperformed the projected savings.

Energy generation is measured by the inverter system that converts solar energy into usable electricity. The company that runs the system posts real-time information online for each inverter on its network. At the town hall, the projected annual production was about $1,200 in electricity. At the end of the first year of operations, energy production was slightly lower than the projection. This was attributed to a particularly rainy June in Upstate New York, which is believed to have reduced the amount of energy generated by the solar panels.

The Town of Preble has also made the energy production information available on its website. On average, the town hall solar system has been providing nearly 50 percent of the building's total annual use. By tracking monthly averages for both consumption and generation, Preble is able to assess both the overall impact of the system and more detailed trends. For instance, if a system fails one month, February is unusually cold, or June is particularly cloudy, it is possible to account for those anomalies.

Examples from the Field

Portland, Oregon: Sustainability City Government Partnership
A collaborative effort to integrate sustainable practices and resource efficiency into municipal operations.

Arlington County, Virginia: Energy Efficiency in Local Government Facilities and Operations
Arlington County's Fresh AIRE (Arlington Initiative to Reduce Emissions) Program launched to improve the energy efficiency of county buildings and operations (highlighted on page 45 of document).

King County, Washington: Energy-Efficient Product Procurement
An environmental purchasing program that started as an initiative to promote recycled materials and is now a comprehensive purchasing program with several energy-related and environmental goals (highlighted on page 21 of document).

Phoenix, Arizona: Energy Conservation Program
An energy conservation program that has evolved into a broader sustainability program that involves land use, recycling, transportation, and water conservation in addition to energy efficiency (highlighted on page 47 of document).

Los Angeles, California: Good Practices in City Energy Efficiency
A project to replace 140,000 inefficient street lights with energy-efficient alternatives.

Seward, Alaska: Sustainable Heating in Government Buildings
A project to heat four city buildings using seawater pumped from a nearby bay and a ground source heat pump.

Kansas City, Missouri: Energy Generation and Transportation Electrification Project
A project to develop a 25-acre, 5-megawatt community solar farm to purchase more electric vehicles and hybrid cars for the city fleet.

Tools and Templates

EPA's Local Government Strategy Series
A series of documents to help policy-makers implement GHG emissions reduction strategies from a variety of sources (e.g., transportation, energy efficiency, renewable energy).

EPA's Tool Finder for Local Government Clean Energy Initiatives
A search tool that helps local government staff screen tools and resources designed to measure impacts of clean energy programs and policies.

EPA's Energy Efficiency in Government Operations
Resources and tools on building energy efficiency, including relevant ENERGY STAR publications.

ENERGY STAR Portfolio Manager
A no-cost, interactive energy management tool that allows you to securely track and assess energy and water consumption across your building portfolio.

Alameda County, California: Model Civic Green Building Ordinance
StopWaste.org clearinghouse, which provides model policies, ordinances, and contract specifications for county residents, businesses, and local governments.

Delaware Valley Regional Planning Commission
Program website that includes a suite of tools that local governments can use to highlight green operations, including a baseline analysis tool, a regional GHG inventory tool, and an electric vehicle ownership tool.

New York State Climate Smart Communities
A collection of resources that provides an overview of climate change; a thorough guide for local climate change responses; and other resources, including land use and wind energy toolkits.

Further Reading

ENERGY STAR Strategies for Buildings and Plants
Proven energy management strategies and no-cost tools for local and state governments.

EPA's Local Government Solar Project Portal
Project development resources and peer-to-peer learning for how to meet environmental, energy, economic, and domestic job creation goals through greater utilization of solar energy facilities that serve municipal operations.

DOE SunShot Solar Energy Resource Center
A repository of work developed by DOE, national laboratories, and SunShot awardees. Contains over 100 unique documents that provide information on model standards and codes, utility policies, solar facilities, financing, incentives, market analysis, solar basics manufacturing, workforce development, shared solar, planning, zoning, permitting, and interconnection.

Baton Rouge Sustainable Government Operations Plan
From the Parish of East Baton Rouge, a plan that provides a framework for integrating energy efficiency and resource sustainability into government services, facilities, and daily operations.

Green Illinois: Green Governments Coordinating Council
Created in 2008 to help state agencies, boards, and commissions adopt a greener way of delivering services.

Acknowledgements

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Take Action: Adpot a Policy

These guidelines are intended to help local governments that want to drive change in their community by adopting an ordinance, plan, or other type of policy. By setting a policy, local governments can require specific actions to achieve concrete objectives. This type of project might include:

- Adopting policies to improve **energy efficiency** in residential or commercial buildings, such as building codes, time-of-sale ordinances, and expedited review of green buildings.
- Adopting policies to promote **renewable energy** production or consumption, such as removing obstacles to renewable energy siting, green power purchasing, solar panel permitting standards, wind siting polices, and solar access policies.
- Adopting **sustainable land use** policies, such as parking maximums, conservation districts, mixed-use districts, agriculture protection districts, green space requirements, and permeable pavements.
- Adopting policies to **reduce or divert waste from landfills**, such as mandatory recycling or composting, construction and demolition waste recycling ordinances, and environmentally preferable purchasing policies.
- Adopting policies to promote **greener transportation**, such as anti-idling restrictions, "complete streets" policies, low-sulfur diesel fuel requirements for construction vehicles, establishment of bicycle parking, and density bonuses for high-quality bicycle facilities.
- Adopting policies to promote **infrastructure resilience**, such as requirements that take into account anticipated changes in flood frequency, and green infrastructure.

The following key steps describe how to put in place a new or updated policy and how to ensure compliance, including best practices and key questions to consider. Information on adopting policies that apply only to internal government operations is covered under Promote Green Government Operations. Projects related to incentivizing or otherwise encouraging behavior changes in the community are covered under Engage the Community; however, to the extent that any rulemaking or other policy-enacting action is required to initiate these projects, that material is covered here.

ADOPT A POLICY

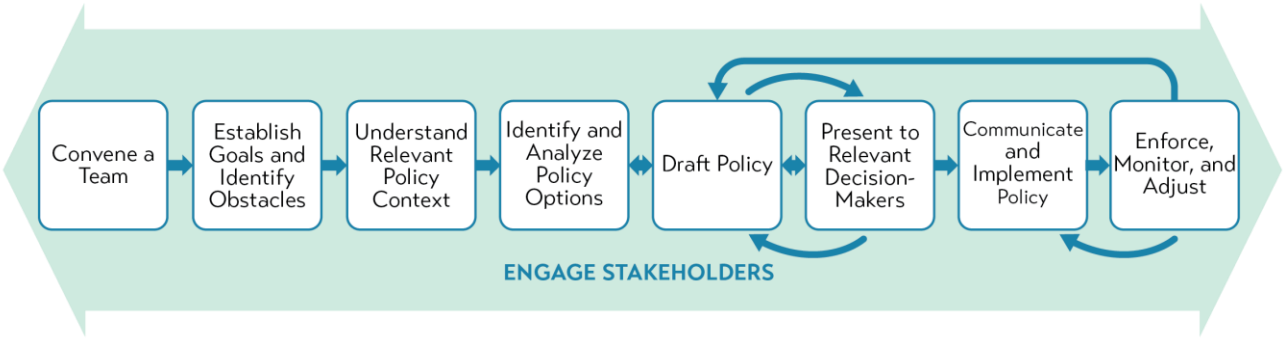
- Convene a Team
- Establish Goals and Identify Obstacles
- Understand Relevant Policy Context
- Identify and Analyze Policy Options
- Draft Policy
- Present to Relevant Decision-Makers
- Communicate and Implement Policy
- Enforce, Monitor, and Adjust

Key Steps

Exact processes for adopting new policies vary by community and topic. However, some general guidance applies. The following guidance outlines the general steps involved in adopting and enforcing a new climate, energy, or sustainability policy in your community.

The steps in this process are not necessarily intended to be pursued in linear order, as shown in Figure 9. For example, engaging stakeholders and reaching out to experts may occur throughout the process of adopting a policy, which may go through several iterations before policies are implemented. Additionally, several steps in the process are fluid; you may find yourself moving back and forth between them, as indicated by the double-sided and curved arrows in the diagram.

Figure 9. Overview of the Key Steps for Adopting New Policies



"Case in Point" boxes provide an example of how one town—in this case, the Borough of West Chester, Pennsylvania—effectively adopted an energy efficiency policy using the steps outlined below. Use the arrows to navigate between "Case in Point" boxes for the Borough of West Chester.

Step 1. Convene a Team

To shepherd the policy adoption process and clearly delineate roles and responsibilities, you may want to consider whether your efforts would benefit from a leadership or support team. It is helpful to ask:

- Is the level of effort large or complex, or are there a variety of stakeholders such that the project would benefit from a cohesive leadership or support team?
- Could existing teams or venues fulfill this role (e.g., ongoing departmental meetings, stakeholder groups for ongoing planning processes)?
- Are you or your stakeholders facing any time constraints that would either make it difficult to work with a large team or imply a need to compress the schedule by using extra resources?

If you determine that a leadership or support team would be beneficial, the following questions will be useful to keep in mind when forming the team.

How large should the team be? Should the team include people only within my organization? What role should each team member play?

Depending on the size and scope of the policy you are adopting, the appropriate team may range from one to two people within your organization to a larger advisory committee made up of people from your agency or other local government agencies, community leaders, and relevant stakeholders. In determining the appropriate team, it is important to consider the various attributes and strengths of potential stakeholders. The most suitable team members will offer valuable input, have important buy-in status, offer support,

demonstrate leadership, and have unique experiences or perspectives. You will likely want to start the research into policy options (see Step 4) before finalizing your team. Steps 3 and 4 of the policy adoption process may be somewhat iterative.

You may want to establish an internal core team who can think through the policy approach. Then, depending on the situation, you can determine the best approach to engage with a broader range of stakeholders. You might establish a formal community engagement process, or you might identify and meet more informally with key community stakeholders individually or convened as a group.

A smaller-scale policy with low barriers to adoption (such as a small update to the building energy code in a community that supports energy efficiency) may require a smaller team, while the adoption of a major plan (such as a climate change action plan) may benefit from broader community input.

Can you partner with other communities or a regional organization to reduce the resources required to adopt a policy?

Neighboring communities or regional organizations can be partners in the effort (see Helpful Tips: Regional Collaborations). Partnerships can reduce the resources required from your organization and can also impact sustainability or resilience on a broader scale. First, you may want to consider whether your neighboring communities might be stakeholders in this process, either because they may be affected by your policy or because they may have an interest in exploring the policy with you and possibly adopting it simultaneously. If so, you can benefit from:

- Seeking out a regional organization (such as your regional planning commission) that could help you streamline coordination and communication across multiple jurisdictions or that could adopt its own policies and procedures to encourage broader adoption of the policy.
- Gathering staff members from a group of communities and meeting regularly to exchange ideas, share resources, and track progress. Communities that have common goals can work together to draft and adopt policies in a resource-effective way. It is worth noting that working with this kind of formal, multi-jurisdictional group can be time-intensive.

Several examples of successful collaborative partnerships include:

- Central New York Climate Change Innovation Program—Through the EPA's former Climate Showcase Communities Program, the Central New York Regional Planning and Development Board worked with seven municipalities on adopting climate change action plans and implementing clean energy demonstration projects.
- Small Cities Climate Action Partnership—Through the EPA's former Climate Showcase Communities Program, four California localities collaborated on resolutions and policies.
- New Jersey Sustainable Energy Efficiency Demonstration Projects—Through the EPA's former Climate Showcase Communities Program, three New Jersey localities collaborated on adopting climate change action plans.
- Carbon-Neutral Cities Alliance—The Urban Sustainability Directors' Network created an alliance to share best practices, highlight innovation, and provide funding to cities undertaking carbon-reducing measures, including clean energy projects.
- The Berkshire Wind Power Cooperative Corporation—Under the Cooperative of 14 municipalities and the Massachusetts Wholesale Electric Company, the municipalities issued a green bond to build a wind farm from which they all receive outputs.

Helpful Tips: Regional Collaborations

Regional collaboration (through a third-party coordinator or through direct cooperation between city staff) can lead to the successful adoption of a policy. However, some common pitfalls include jurisdictions that feel they are competing with each other, complications in meeting grant reporting requirements, or partners that lose interest over time. Building trust and good personal relationships, establishing clear goals and partnerships early in the process, highlighting common benefits, and creating structured timelines and communication processes can help overcome these challenges.

Case in Point

In 2006, the Borough of West Chester, Pennsylvania, (1.8 square miles, pop. 18,000) established an ad-hoc committee to focus on reducing GHG emissions. The five-member Borough Leaders United for Emissions Reduction (BLUER) committee, tasked with reducing GHG emissions in the community, led the effort to adopt an energy efficiency policy. The volunteer committee was composed of two residents, one representative from the local university, one business owner, and one county facilities representative. The committee was formed by the Borough Council to implement West Chester's commitment through the ICLEI Cities for Climate Protection Campaign.

BLUER developed a recruitment and application process to select new members. The first committee member reached out to contacts and used personal networks to identify interested individuals. Volunteer committee members were committed to GHG reductions in West Chester and dedicated their personal time to the committee's work. The committee decided that, given the anticipated scope of the policy—an update to an existing policy with high community support—no additional leadership team was needed.

Step 2. Establish Goals and Identify Obstacles

Before embarking on a process to adopt a policy, it is helpful to first clarify the exact goals of the policy and the problem statement that your policy seeks to address. These goals may derive from a higher-level plan (such as a climate change action plan or comprehensive plan), or from other policy drivers in your community. For example, a policy goal may be to reduce residential energy use or GHG emissions. While high-level goals are important as policy drivers, it is important to also develop goals that are as specific as possible, with quantitative targets and defined audiences, when possible. See the Set Goals and Select Actions phase for additional information on the goal-setting process.

As you establish goals and identify obstacles, you may want to consider assessing how the project may affect different segments of the community in different ways, including variable distribution of benefits and burdens. In addition, success metrics can account for equity by measuring who benefits and setting targets for equitable distribution of benefits.

Case in Point

The BLUER committee began by conducting a baseline community-wide GHG inventory. The GHG inventory showed that electricity use was a primary cause of emissions in the community, so BLUER identified energy efficiency as a key mechanism to reduce emissions.

BLUER set a goal of reviewing West Chester's building and zoning codes to identify opportunities to improve energy efficiency. This effort contributed to BLUER's overall goal of reducing emissions 10 percent below 2005 baseline levels by 2015. West Chester's emissions went down by 11 percent during this period, exceeding BLUER's goal.

Step 3. Understand Relevant Policy Context

Before drafting a new policy, it is helpful to understand the details of relevant policies in your organization or agency and the overall policy context. A solid understanding of local community dynamics will also be important to policy adoption.

You will need to determine whether the policy you want your community to adopt aligns with existing policies. You can begin by reviewing the existing policies to understand exactly how they are structured. Would the policy be an outright replacement of an existing policy, an update to an existing policy, or an entirely new policy? For example, would you need to change a whole section of municipal code or just a few lines? If you want to create a new policy, you can review existing policies that may relate to your new effort to ensure that they are compatible.

It is important to understand how the new policy interacts with existing state, federal, and other relevant laws and policies. You will also need to ensure that your jurisdiction has authority to adopt the policy in mind. If you are not sure how to find this information, you can contact the legal department of your organization. You could also consult with professional associations such as the American Planning Association, which may have dealt with a particular policy and have advice on legal aspects.

You can continue to develop an understanding of the local context surrounding the policy by asking questions such as:

- What interest has the community expressed in this policy?
- What groups will support, oppose, or want to know more about this policy?
- What do you know (or can you find out) about the interests of the governing body as they relate to this policy?
- How will this policy affect different community groups? Will some groups benefit more than others? Will some groups be burdened more than others?
- Has your jurisdiction tried to adopt this policy before?
- How will this policy be perceived in your community?
- Is there an important timeframe for adopting this policy?

You can identify and engage stakeholders who can help you answer these questions and build support for the policy. Stakeholders may include community leaders, business owners, residents, and anyone who may be affected by the policy. It is important to engage these stakeholders **early and often** throughout the process. Informal meetings with community leaders can be a good way to start the process, discuss these issues, and build early support for the policy. See the Engage and Communicate phase for additional information on engaging stakeholders.

Case in Point

Shortly before BLUER made plans to adopt an energy efficiency policy, the West Chester mayor surveyed residents and found that environmental issues were a high priority for the community. This indicated community support for BLUER's efforts, which BLUER could leverage as they made the case for revised codes.

BLUER identified two primary ways to affect building energy use through local codes: by revising the building energy efficiency code, which would require approval from a state committee, and by updating conditional use criteria within the local zoning code. They conducted research to understand what would be involved in pursuing either approach.

BLUER also began reaching out to key stakeholders to learn about community perspectives and build support for an energy efficiency policy. In particular, BLUER met early on with members of the Borough Council and the building community to determine whether they would have any concerns about a new energy efficiency policy.

Step 4. Identify and Analyze Policy Options

When you understand your organization's community and policy context, you can identify and evaluate options for your new policy, including enforcement mechanisms.

Other communities may have adopted policies similar to the one you are pursuing. You can seek out related policies, such as model ordinances, that have been adopted in communities comparable to yours in ways relevant to the policy (e.g., challenges, government organization, and population). The identified policies can serve as inspiration as you structure your own policy. It may be helpful to reach out to your counterparts at other organizations and ask about best practices and lessons learned. Some ideas for research strategies:

- Contact someone who has done what you want to do, and talk with them about the challenges and opportunities they faced. You might consult with professional associations like the American Planning Association or the International City/County Management Association, which may have dealt with relevant policies.
- Review databases for examples of policies previously adopted by states and cities. For example, DSIRE includes local policies, searchable by geography and policy type. Other databases are listed in the Tools and Templates section.
- Review model plans and ordinances, which provide a template for crafting your own policy (Table 6).
- Review guidance from other organizations on larger-scale planning efforts:
    - The American Council for an Energy-Efficient Economy's (ACEEE) report on best practices in heat island mitigation policies
    - The ACEEE's Local Technical Assistance Toolkit.

Table 6. Examples of Model Ordinances

Title	Details
Alameda County, California: Construction and Demolition Debris Recycling Model Ordinance	A model ordinance from the StopWaste.org clearinghouse that requires recycling of construction and demolition debris
Minnesota Model Ordinance for Transit-Oriented Development	Clearinghouse of model ordinances related to sustainable development, transportation, and land use
Delaware Valley Regional Planning Commission Renewable Energy Ordinance Frameworks	Provides frameworks for municipalities to develop ordinances to govern the siting of small-scale solar, geothermal, and wind systems
Columbia Law School Model Municipal Wind Siting Ordinance	Model ordinance for siting wind energy, including provisions for permits, approvals, operation, and oversight of wind energy conversion systems

As you research options, it is best to evaluate multiple alternatives. For example, if your goal is to improve the energy efficiency of commercial buildings, you can compare the implications of alternatives for a building energy code, such as:

- Applying the code to new construction vs. major renovations
- Setting requirements for all properties vs. under-performing properties
- Determining what events "trigger" requirements (e.g., definition of "major" renovations, time of sale, a specific date for all properties)
- Putting the code into effect on one date vs. another
- Updating the building efficiency standards vs. requiring all buildings to earn the ENERGY STAR
- Determining the appropriate energy requirements, factoring in your climate zone and other relevant state or national targets
- Alternatives for enforcement mechanisms

Your research on existing policies will inform which alternatives to evaluate.

For each alternative, you can analyze the costs, benefits, and societal impacts of the policy, as well as any risks, or needed support and enforcement. Selection of the best alternative will be based on your goals (e.g., largest reductions in energy use, lowest cost and complexity, impacts on the greatest number of people), while keeping in mind the direct impacts on those most affected by the change in policy. You can use this comparative information to support your policy decision. Additional information on evaluating actions is available under Step 5 of the Set Goals and Select Actions phase.

Case in Point

The West Chester, Pennsylvania, BLUER committee researched several policy options for addressing energy efficiency in buildings, thinking through the entire process of how buildings are constructed to identify policy opportunities. For example, the committee considered attempting to update the energy efficiency code versus adding an energy efficiency criterion to the borough's conditional use criteria in the zoning code. The committee opted to pursue changes to the conditional use criteria because of the political and practical barriers involved in changing energy codes, which requires approval from a state committee.

Within the conditional use criteria, BLUER also considered several options for promoting energy efficiency, including ENERGY STAR, LEED, Green Globes, and other programs. Ultimately, West Chester pursued an addition to the zoning code's conditional use criteria that required buildings to earn the ENERGY STAR.

According to BLUER chair Dianne Herrin, ENERGY STAR was the "clear choice" for West Chester. ENERGY STAR most directly addressed energy efficiency, the goal of the policy, with minimal burdens for developers in the small town.

BLUER continued to engage community members and decision-makers throughout this process. They prepared a brief (10-minute) presentation to give to the Borough Council, developer community, and building managers, discussing the benefits of energy efficiency in buildings and building support for the policy.

Step 5. Draft Policy

Once you have analyzed the alternatives, it is time to draft a policy that works for your community. This may be largely identical to one of the policies you reviewed or a combination of elements from various existing policies, or it may include completely new elements or structures. When drafting the policy, you can decide which format would be most appropriate and follow your organization's policy-making procedures. Policies can take many forms, including a formal plan, a local ordinance, or a written recommendation to the decision-making body.

As you draft the policy, it is helpful to consider the following questions:

How will the policy be implemented, and who will be responsible for implementation?

As you are drafting the policy, it is useful to consider who will be responsible for implementing the policy. If appropriate, you can include this language in the policy itself. For example, the City of Austin drafted and adopted an ordinance to require properties in Austin to undergo energy audits before being sold. The ordinance itself assigned responsibility for implementing the policy to the director of the Austin Electric Utility (the public utility and a city department).

How should the policy be enforced, and who will be responsible for enforcement?

It is useful to consider how the policy will be enforced, who will be responsible for enforcement, and whether to include that language in the policy. Examples of enforcement mechanisms include establishing periodic audits or fines for non-compliance. Model ordinances or plans are good places to look for examples of how other jurisdictions have enforced similar policies.

How much will policy implementation and enforcement cost? What funds could cover these costs?

Keeping in mind the relative resources required will help you determine the most appropriate implementation and enforcement mechanisms for the policy. Could existing staff and responsibilities cover

enforcement? For example, if the policy adds requirements for new construction in the community, could existing code enforcement functions include enforcement of the new policy in the context of their existing roles and capacity? Or would additional funds or staff be required to carry out enforcement of the new requirements? If the policy requires ongoing activity, you can try to identify ongoing funding to cover that activity (not a one-time grant). See the Obtain Resources phase for information on securing staff time, funding, or other resources to implement and enforce the policy.

It is a good idea to build your justification as you draft the policy. You may want to develop a formal document that you can use to support the proposed policy and the way it is structured. The justification document might include an alternatives analysis documenting the analysis done in the previous step and the reasons for the selections you made. It may also include sections related to the policy's fiscal impacts, legal issues, sustainability issues, or other metrics that are important to consider when proposing any policy.

Case in Point

The West Chester BLUER committee members drafted an ordinance to bring before the Borough Council. The ordinance amended West Chester's zoning code to require that any developers seeking a "conditional use" approval for a project must design the buildings to meet ENERGY STAR energy performance goals. In West Chester, conditional use approvals are required for any buildings taller than 45 feet. Within one year of operation, having done the upfront work to earn the ENERGY STAR, building owners could assess energy use and apply for the ENERGY STAR label and recognition. The new requirement to earn the ENERGY STAR was added to the list of other conditional use criteria required to receive a building permit, such as parking, lighting, and signage requirements. The municipal legal counsel provided support in drafting the language of the ordinance.

See § 112-33.1 of the policy.

Step 6. Present Proposed Policy to Relevant Decision-Makers

Now that the policy is drafted and you have informally engaged with decision-makers throughout the process, you can formally present the policy to the relevant decision-making body to consider for adoption. When presenting the proposed policy, it is a good idea to be prepared to:

- Summarize the problem or opportunity you are trying to address
- Describe the process you have gone through to arrive at your recommendation, including how you have engaged stakeholders and any input received
- Present the content of the proposed policy
- Describe how the policy will be implemented and enforced, and who will be responsible for implementation and enforcement
- Explain how the policy would impact the agency in terms of cost and staffing
- Make clear why the decision-makers should adopt the policy, and any other relevant issues such as urgency or potential alternatives.

If the policy is adopted, you can move on to implementing the policy.

If the policy is not adopted, you may want to consider whether it is appropriate to revise, address concerns, and try again. It is best to keep stakeholders engaged as you make these decisions.

Case in Point

Once a final draft of the ordinance was complete, BLUER followed the Borough Council's protocol to present it for a vote. They published a public notice in the local paper about the proposed ordinance, held a public hearing, and had the ordinance put on the agenda for the next Borough Council work session. At the work session, council members reviewed and discussed the ordinance, and BLUER members answered their questions. Since BLUER had already briefed the Borough Council using their 10-minute presentation and proactively addressed their concerns, BLUER faced very few questions and little to no resistance from the council. After presentation to the council, the proposed ordinance was moved to the voting session the following week, where it passed unanimously. In total, the process to adopt the ordinance took about six months.

Step 7. Communicate and Implement the New Policy

Once the policy has been adopted, it is helpful to consider the following questions:

Who needs to know about the new policy for it to take effect?

Affected parties need communication about the policy. These may be individuals within city or government departments, the building community, business owners, homeowners, or others. In addition, it is good practice to inform those who participated in early engagement about how their perspectives were reflected in the adopted policy.

What do they need to know for the policy to take effect?

If the policy requires people to adopt new behaviors, it is helpful to make sure they know how to comply with the policy. It may make sense to hold trainings on the new policy for people affected. For example, Sacramento developed river-friendly landscaping standards and held a series of trainings with park staff and local landscape architects to inform them of how the standards work.

See the Engage and Communicate phase for additional tips on conducting outreach and communicating policies. See the Obtain Resources phase for information on securing staff time, funding, or other resources to communicate the policy.

Case in Point

Once the council passed the policy, BLUER issued a press release and organized a training session for local building managers and developers about the ENERGY STAR Portfolio Manager tool. They also prepared a checklist for the zoning officer to distribute to all relevant building permit applicants, including background information on the ordinance, a checklist of tasks necessary for compliance, and resources. Through these efforts, BLUER made sure that builders knew exactly what was expected of them and how to comply.

Step 8. Enforce, Monitor, and Adjust

Once the policy is in place and being enforced, you can monitor and evaluate its effectiveness and make any needed adjustments to refine your communication and enforcement strategies. It is helpful to periodically revisit the policy and adjust it based on changing conditions in the community. For example, as green building practices become more standard, you might want to adopt a revised green building policy with more stringent performance thresholds.

Enforcement can take many forms, and can also evolve with time as you better understand how the public is responding to the policy. For example, San Francisco changed the enforcement of its 2008 composting ordinance from a fine-based system to an outreach approach in response to public resistance to fines. Visit the Track and Report phase for additional information.

Case in Point

In West Chester, Pennsylvania, enforcement of the policy fell to the zoning officer, who now considers the ENERGY STAR requirements in addition to other conditional use requirements in granting building permits.

Though West Chester has not implemented any formal monitoring and evaluation efforts related to ENERGY STAR, the new policy has been successful, and all private buildings built since the passing of the ordinance have earned the ENERGY STAR. On average, ENERGY STAR certified buildings and plants use 35 percent less energy and release 35 percent fewer GHG emissions than comparable buildings across the country. However, West Chester has noticed that it is difficult to fully evaluate the benefits of the ordinance in its current form, since builders are not required to earn the ENERGY STAR; they are required only to demonstrate that the building is designed to meet ENERGY STAR energy performance goals. In 2016, West Chester passed an ordinance that requires commercial buildings to apply for the ENERGY STAR one year after the building becomes operational.

Examples from the Field

Salt Lake City, Utah: Idle Free Ordinance
Information about an ordinance that prohibits unnecessary vehicle idling over two minutes within city limits.

Fayetteville, Arkansas: Energy Action Plan
Plan for reducing waste, reducing energy use, and increasing energy efficiency in an equitable manner, created with input from many stakeholder groups.

Bellingham, Washington: City Council Resolution to Start a Municipal Green Power Purchasing Program
Resolution to launch a municipal green power purchase program (pp. 97–99 of the Compendium of Best Practices).

New York City, New York: Car Share Zoning Text Amendment
New York City's amended city zoning resolution that allows car share vehicles to park in off-street parking garages and lots.

Chicago, Illinois: Landscape Ordinance
Ordinance that requires developers to include landscaping in their building plans to reduce urban heat and air pollution, promoting adaptation.

Tools and Templates

EPA's Tool Finder for Local Government Clean Energy Initiatives
A search tool that helps local government staff screen tools and resources designed to measure impacts of clean energy programs and policies.

EPA's State and Local Energy and Environment Program: Provides technical assistance; analytical tools; and outreach support to state, local, and tribal governments.

DOE's Building Energy Codes Program, Adoption Process
From the U.S. Department of Energy, information on how to adopt building energy codes, including technical assistance and information on state energy codes.

Smart Growth Implementation Toolkit
From Smart Growth America, a tool for local governments looking to adopt smart growth land use planning and community design policies; includes a policy audit that could support Step 2.

Georgetown Climate Center: Resources to advance effective policies in the United States that reduce GHG emissions and help communities adapt to climate change. Includes a searchable adaptation clearinghouse and a collection of state and local adaptation plans.

Further Reading

EPA's Reducing Urban Heat Islands: Compendium of Strategies
Guide that describes measures that communities can take to address the impacts of urban heat islands, including voluntary and policy efforts.

Local Energy Planning in Practice: A Review of Recent Experiences
From the ACEEE, a report that reviews the energy efficiency planning activities of 30 local governments, including commonalities and opportunities for improvement.

ACEEE's Local Energy Efficiency Policy Case Studies: Provides comprehensive information on energy efficiency policies and projects implemented in dozens of localities around the United States.

Green Cities California: Includes best practices and examples of sustainability policies related to energy, environmental health, transportation, urban design, urban nature, waste reduction, and water.

Colorado Center for Sustainable Urbanism's Sustainable Development Code Framework
Framework that provides ideas for municipal and regional codes to address a full range of sustainability issues.

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Take Action: Engage the Community

Promoting voluntary actions, even small ones, can have a big impact on saving energy and building sustainable communities. For example, a single light bulb that has earned the ENERGY STAR can save more than $50 in electricity costs over its lifetime. According to EPA's Greenhouse Gas Equivalencies Calculator, saving 1,000 kWh of electricity is equal to reducing emissions by more than 1,550 pounds of carbon dioxide equivalent.

Projects to encourage voluntary actions and behavior change could include:

- **Promoting residential and commercial energy efficiency.** For example, holding a building competition to save energy, water, or waste; conducting a small business energy efficiency challenge; encouraging residents to adopt pledges to reduce energy use or participate in energy rebate programs; and providing financial and technical assistance for residential energy audits and retrofits.
- **Increasing community renewable energy production or consumption.** For example, promoting usage requirements to become an EPA Green Power Community, conducting outreach to encourage voluntary purchases of renewable energy, providing rebates for solar energy installation, and encouraging residents and businesses to invest in community solar projects.
- **Reducing community waste.** For example, offering a curbside recycling service, conducting outreach and training to initiate a composting program, and organizing a community-wide paper-shredding day to promote paper recycling.
- **Encouraging greener transportation choices.** For example, distributing walking and biking maps, bus schedules, or free bus passes, and promoting a community-wide bike-to-work challenge.
- **Promoting sustainable land use.** For example, hosting a forum to promote the use of smart growth, transit-oriented development, neighborhood development principles in parcel or neighborhood design; providing financial incentives for more compact development; and conducting outreach and training on green gardening practices to conserve water and protect the soil.
- **Promoting community resilience.** For example, conducting demonstration projects of strategies that reduce the urban heat island effect, holding rain garden or rain barrel workshops to promote stormwater mitigation, or setting up a neighborhood check-in system during extreme weather events.

ENGAGE THE COMMUNITY

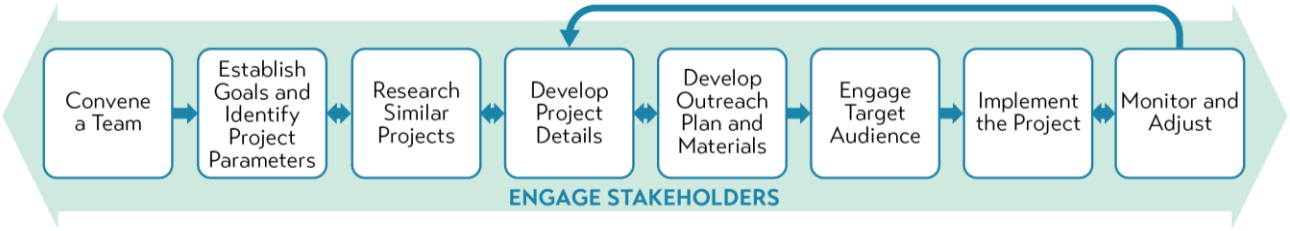
- Convene a Team
- Establish Goals and Identify Project Parameters
- Research Similar Projects
- Develop Project Details
- Develop Outreach Plan and Materials
- Engage Target Audience
- Implement the Project
- Monitor and Adjust

The following key steps focus on developing projects to encourage the adoption of voluntary actions by a community's residents, businesses, and visitors. Information on adopting a policy in the form of a plan, ordinance, regulation, or other mechanism to mandate sustainable actions is covered under Adopt a Policy. Information on projects to make changes to government operations is covered under Promote Green Government Operations.

Key Steps

The key steps presented here describe how to design and roll out voluntary projects, including crafting effective outreach campaigns and continually monitoring and adjusting project activities based on feedback from stakeholders and measured outcomes. The steps are not necessarily intended to be pursued in linear order, as shown in Figure 10. For example, engaging stakeholders will likely occur throughout the process, and several steps in the process are fluid; you may find yourself moving back and forth between them, as indicated by the double-sided and curved arrows in the diagram.

Figure 10. Overview of the Key Steps for Designing and Rolling Out Voluntary Projects



"Case in Point" boxes provide an example of how one town—in this case, the City of Eugene, Oregon—effectively implemented an individualized marketing program to encourage adoption of alternate transportation using the steps outlined below. Use the arrows to navigate between "Case in Point" boxes for the City of Eugene.

Step 1. Convene a Team

To effectively engage the community, you may want to consider whether your efforts would benefit from a leadership or support team. It is helpful to ask:

- Is the level of effort large or complex, or are there a variety of stakeholders such that the project would benefit from a cohesive leadership or support team?
- Could existing teams or venues fulfill this role (e.g., ongoing departmental meetings, stakeholder groups for ongoing planning processes)?
- Are you or your stakeholders facing any time constraints that would either make it difficult to work with a large team or imply a need to compress the schedule by using extra resources?

If you determine that a leadership or support team would be beneficial, the following questions will be useful to keep in mind when forming the team.

How large should the team be? Should the team include people only within my organization? What role should each team member play?

The size of your team is an important consideration. A larger team may be more representative; a smaller team may be more efficient. Potential stakeholders and individuals have various attributes and strengths in offering valuable input, support, leadership, and unique experiences or perspectives.

It is also useful to identify the key people or partners who can help you create a better, stronger project, as well as to articulate your goals, help create buy-in, and ensure that your goals are realized over the course of the project. These may include inspired staff members, community leaders, specific departments within the government, a facility that has identified an opportunity to make a change, or private organizations. It is helpful to include leaders who represent key populations within your community, especially those with specific needs or who may be underrepresented.

Can you partner with other communities or organizations to reduce the resources required for the voluntary project?

Neighboring communities or other organizations can be partners in the effort. Partnerships can reduce the resources required from your community and can also impact sustainability or resilience on a broader scale. You may want to consider meeting regularly with members from a group of communities to exchange ideas, share resources, and track progress. It is worth noting that working with this kind of formal, multi-jurisdictional group can be time-intensive.

Visit the Engage and Communicate phase for specific guidance on how to engage with potential project partners.

Step 2. Establish Goals and Identify General Project Parameters

The first step in designing a voluntary project is to clearly define the goals and objectives, identify the specific activity you would like to undertake, understand the target audience, and characterize the general context and resource availability.

Is there a specific need or momentum for a voluntary project that would benefit your community? For example, if the cost of waste management in your community recently increased, is there a company that would like to initiate or expand a composting program? Did your city planners recently attend a conference where they learned about voluntary projects in similar communities? Did a recent climate change action plan identify transportation or buildings as the largest source of GHG emissions in your community? Does a new energy regulation present opportunities for implementing a voluntary energy-saving project?

You can start by clearly identifying the goals and the type of project that your community wants to pursue. Visit the Set Goals and Select Actions phase for guidance on articulating specific goals and identifying actions.

As you define the project's initial scope, you may want to consider the types and amounts of available resources, including funding and staff time. Visit the Obtain Resources phase for guidance on how to obtain necessary resources.

Case in Point

The City of Eugene, Oregon (pop. 157,986) developed significant bicycle and pedestrian infrastructure but realized that those investments alone were not enough to reach the target number of people biking or walking. Based on the City of Portland's TravelSmart pilot, Eugene implemented an individualized marketing program called Smart*Trips* to encourage adoption of alternate transportation. The program's specific goals were to decrease driving trips; reduce carbon emissions associated with driving; and increase walking, bicycling, and public transit. The first program was implemented in the Harlow neighborhood in 2010.

During the summer of 2011, the city secured a grant from EPA's former Climate Showcase Communities program to expand the Smart*Trips* program. Considering the available funding, the city decided to focus on three centrally located neighborhoods: Trainsong, Whiteaker, and Jefferson/Westside. The program was called Smart*Trips*: Central and targeted a total of 6,300 households.

The city selected these neighborhoods due to their potential to achieve a substantial shift in transit mode, based on transit service availability, walking/bicycling infrastructure, and local destinations such as pedestrian-friendly business districts, parks, schools, and downtown. Environmental justice was another priority factor. The selected neighborhoods have a significant percentage of residents living below the poverty line, are more ethnically diverse, face greater transportation barriers, and receive fewer services than more affluent, less diverse neighborhoods.

Step 3. Research Similar Projects

When designing projects, it is helpful to build on existing projects—whether by collaborating with ongoing projects or building on lessons learned from past projects.

Understand Local Efforts

Are there any complementary (or competing) projects in your community, state, or region? You can look for projects that target the same audience or address the same topic. Could you combine your efforts or otherwise collaborate with existing projects? Are there any lessons learned from these projects on how to best engage your audience?

Learn from Others

Many communities around the country have implemented voluntary projects and can offer valuable resources. Learning from their experience can save you time and effort, and help you avoid pitfalls, make realistic goals, and develop a strong project. You may want to:

- Look for national, regional, or local projects that are consistent with your goals, community type, local interest level, and available resources.
- Identify best practices and potential projects to replicate.
- Reach out to people who have implemented similar projects.
- Identify the components of similar projects that are appropriate for your community.
- Decide whether you want to tie into an existing project (e.g., a regional or national project) or create a new voluntary project in your community.

Case in Point

The City of Eugene's SmartTrips: Central program was modeled after a successful TravelSmart pilot in Portland. The TravelSmart pilot area covered more than 14,000 people in Portland and generated a large data collection and analysis effort. Following the completion of the TravelSmart pilot, Portland modified the program and launched Portland SmartTrips to reduce costs and add hands-on experiential activities.

Eugene focused on the SmartTrips component of Portland's program. Eugene's staff participated in trainings and used outreach and other materials developed by Portland for SmartTrips. The Eugene program also reached out to another former EPA Climate Showcase Communities grantee, the Sustainable Transport for a Sustainable Future program in Salt Lake City, Utah, to brainstorm ideas and share lessons learned.

In addition, Eugene developed its *Transportation Masters* leadership training by building on the Climate Leadership Initiatives' *Climate Masters* program. The *Transportation Masters* program offered a free, 4-hour training to interested community members in the targeted area. The participants learned about the impact of

others in their community. Then they each committed to 10 hours of service and served as peer leaders in the program's outreach events.

Following the success of its SmartTrips: Central program, Eugene is currently advising other local governments interested in implementing their own SmartTrips programs.

Step 4. Develop Project Details

Once you have convened a team, established goals, identified general project parameters, and conducted research into similar projects, you can integrate your findings and design your project. It is helpful to clearly determine the behaviors you want to target and consider different incentive systems, for example:

- **Awards and recognition**. Holding an energy efficiency competition with prizes; developing a sustainable certificate program; or promoting the use of pledges (see Helpful Tips: Award and Incentive Programs).
- **Financial incentives**. Advertising any federal, state, local, or utility rebates for solar energy installation.
- **Technical assistance.** Providing assistance in the form of workshops, installation kits, or guidebooks.

In addition, the project details will specify how the project will work. For example, will project interaction be web-based, face-to-face, or a combination of both? Will you require participants to provide proof of their actions, or will you rely on the honor system? How will participants report their actions, and how will you verify their reports? How will you distribute materials or incentives?

As you develop the project details, you may want to consider the following elements:

- **Audience.** Who will be affected by the project or should know about the efforts and successes of the project? Does the audience report to a county or state government? Is the ultimate audience the taxpayers? Is the audience made up of citizens and business owners? Have you engaged audiences from all neighborhoods? Seeking to understand the motivations of your audience and engage them appropriately will benefit the project. Visit the Engage and Communicate phase for more information on understanding audiences.

- **Equity.** What will be the impacts of the project on various communities? It is important to receive insights from all neighborhoods and from multiple perspectives.
- **Legal considerations.** Have you obtained necessary permissions and approvals from relevant organizations and individuals (e.g., local government departments, elected leaders)? The project needs to comply with all applicable local, state, and federal laws.
- **Resources.** Will sufficient resources be available for the full project duration, including maintenance requirements and ongoing implementation? You will need to define and secure needed resources (see the Obtain Resources phase).
- **Timeline.** Does the timeline that you have developed for the project take into account staff availability and capacity?
- **Tracking and reporting.** Have you developed a plan to measure, report, and evaluate quantifiable metrics? Guidance from the Track and Report phase can help you develop the appropriate metrics.

Helpful Tips: Award and Incentive Programs

For awards and certificate programs, other communities have found it helpful to:

- Use specific, clear, and consistent certification requirements.
- Ensure that earning a certificate means actual change or progress.
- Distribute professionally printed certificates that businesses are proud to display.

For incentive programs, other communities have found it helpful to:

- Target incentives to encourage participation beyond the early adopters, who would likely make the change without any incentive.
- Minimize administrative burdens to make it easy for people to obtain the incentives (e.g., provide residents with a few free bus passes as an automated part of vehicle registration).
- Make technical assistance easy to obtain. The time and location of workshops and materials distribution can lower the barrier for participation.

Case in Point

To close the information gap, the Smart*Trips*: Central program organized educational activities and offered incentives to encourage residents in the targeted neighborhoods to try alternate transportation options. Residents could order a Smart*Kit* with information about local walking, bicycling, or transit resources. In addition to educational materials such as brochures, guides, and manuals, a Biking Kit included a bicycle pant leg strap, a Walking Kit included a pedometer, and a Transit Kit included a free week of bus passes. Participants could also choose from one of the three free travel tools: a Smart*Trips* BPA-free metal water bottle, a Smart*Trips* umbrella, or a bandana that displays the city walking and biking map. Smart*Trips*: Central staff delivered a total of 673 Smart*Kits* by bicycle, and used the deliveries as opportunities to raise community awareness about the program.

The program also engaged local businesses to offer discounts and donations to the program. For example, the program worked with three businesses to provide sweet treat samples along the five-mile Sweet Treats Bike Ride. It also partnered with the City of Eugene's Summer in the City series to encourage climate-friendly transportation to the series' events.

Smart*Trips*: Central encountered some challenges related to attendance and staffing during the program. As a lesson learned, the program recommended reducing the number of activities and events, while increasing partnerships with already trusted community networks and social service providers like affordable housing and retirement centers to build on their existing activities. For example, the program plans to bring Walking and Biking Kits to the events organized by partner organizations in the future.

Step 5. Develop an Outreach Plan and Materials

Effective outreach and communication efforts are especially important for voluntary projects to motivate stakeholders to take action. It is a good practice to develop simple and clear messages that will resonate with the target audience (see Step 6). You can design an outreach plan and communications materials to convey these messages to the target audience (see Helpful Tips: Storytelling).

Visit the Obtain Resources section and the Engage and Communicate phase for additional guidance on ways to effectively communicate and market projects to the community. You can maximize the effectiveness of your outreach efforts by identifying the best venues to reach your audience, such as specific media outlets (including social media), community organizations, or community events. You may also want to work with the local media in your outreach plan, as they can play a key role in disseminating your project's messages to the community.

Helpful Tips: Storytelling

Telling stories can effectively encourage behavior change. You may want to incorporate storytelling into your outreach materials, events, or strategies. You can ask a peer to share his or her experiences in overcoming the barriers to behavior change. Peer-to-peer sharing can inspire and motivate others to take similar action. According to the Goodman Center, good stories include the following elements:

- **A protagonist**—a person the story is about.
- **A goal**—a direction for the story and an inciting incident that sets it in motion.
- **Barriers**—one or many obstacles that must be overcome in pursuit of the goal; more barriers make the story more compelling.
- **Achievements**—how the protagonist overcame the obstacles to achieve his or her goals.
- **Resolution**—how the situation was resolved; stories do not have to have a happy ending.

Case in Point

The SmartTrips: Central program used a multi-pronged approach to announce the activities of the program, including three print newsletters, mailed forms, reminder postcards, and non-print communications in weekly emails, on a website, and through social media posts on the program's Facebook and Twitter pages. The reminder postcards sent to residents who had not ordered a SmartKit were found to be effective in increasing the response rate.

SmartTrips: Central also partnered with organizations to engage the community via existing channels and networks. The program promoted its activities through the city's and community groups' event calendars, local businesses, and a local biking electronic newsletter.

The program hosted 12 community events including group walks, guided bicycle rides, workshops, and the signature Eugene Sunday Streets event, where the city closed three miles of streets to vehicular traffic, opening them up for people to bike, walk, skate, and dance through the streets. An estimated 2,000 people attended the event. SmartTrips staff also participated in other community events and offered information and advice to residents about multimodal transportation. In addition, the city installed 30 signs to clearly mark existing bike routes and infrastructure.

To facilitate peer-to-peer storytelling and learning, the program launched the *Transportation Masters* program. Six community members received training on environmentally friendly transportation and strategies to engage others in their community. They then staffed outreach events and advised their peers on alternate transportation options. The events were designed to bring together a mix of people, so that residents with more experience in alternate transport could share stories with and teach those who were less experienced. Furthermore, the City of Eugene is working to develop a miniseries for a local TV station in which they can interview past participants in the program.

The program staff also stressed the importance of making resources and events accessible to the target audience. For example, they suggested that materials be translated for communities where English is primarily a second language, and that events not be scheduled too early on Saturday mornings.

Step 6. Engage the Target Audience

Once you have developed your project details, it is a good idea to reach out directly to the target audience to deepen and refine your understanding of their values and motivations, as well as any barriers they face in taking the desired action. This can help you design an effective outreach plan and materials that resonate with them (see Step 5).

It is helpful to prepare a series of questions to discuss with representatives of the target audience. For example, for a sustainable transportation project, you might ask:

- What is your current primary means of transportation?
- What factors determine the transportation you use?
- How do you get information about transportation options?
- Do you ever walk, bike, carpool, or use public transit instead of driving alone?
- What motivates you to use alternate transportation?
- What inhibits you from using alternate transportation?
- What would motivate you or make it easier for you to use alternate transportation?

When you present your ideas about the effort to the representative target audience, you can request their input and feedback on project options (see Helpful Tips: Focus and Stakeholder Groups). In addition, you can use the opportunity to:

- Identify focus groups within the target audience to help you develop and implement the project.
- Identify individuals or groups that can support your outreach efforts and build community support by spreading the word about the project, serving as model participants, and encouraging others to participate.
- Solicit partners for project implementation. The implementers of past projects recommend working with community leaders and organizations that have a membership base (e.g., homeowner associations); that know what messages resonate with their members; and that can help you promote the project.

Helpful Tips: Focus and Stakeholder Groups

Professional focus groups can be time-intensive and expensive; to make the best use of focus groups, it is important to come prepared with project options to test and questions to discuss. You can also make use of key information sources and stakeholder groups, who might be less representative but can be quick sources of useful ideas about audiences and messaging.

You may also want to engage community leaders and elected officials, since their support can increase the project's relevance, significance, and effectiveness and may be necessary to put the project into place. Community leaders and elected officials can also provide guidance on how to best engage the community and can personally raise the project's visibility.

For more guidance on how to communicate with and engage partners in project design and implementation, visit the Engage and Communicate phase.

Case in Point

To understand local needs and cultures, as well as the barriers residents face in adopting alternate transportation, Smart*Trips*: Central sent out a travel survey to all target area households before the program started. The survey results revealed that habits and lack of information on transportation options were the two main barriers to a shift in transit mode. Additionally, demographic information showed that some households faced language or income barriers.

Smart*Trips*: Central staff also traveled to the targeted neighborhoods and tried biking, walking, or riding a bus to identify obstacles to taking alternate transportation in the area. They continued to engage the target audience throughout the program (e.g., via the delivery of informational materials, through outreach events) to understand and tailor the program to local needs.

Before rolling out the program, Smart*Trips*: Central presented its proposed activities to the city's bicycle and pedestrian advisory committee to get their feedback. The program also engaged the city mayor and city council members by inviting them to outreach events and including updates about the program in the city government's weekly newsletter.

Step 7. Implement the Project

Once you have completed the previous steps, you will be ready to launch the project. Other communities have organized an event to announce the project launch, and have invited the engaged stakeholders, media, and other interested parties. You can start implementing your outreach plan by distributing materials, placing media stories, or activating web pages to spread the word about the project. (See Helpful Tips: Taking Care of Administrative Steps).

You may want to consider an incremental rollout, which will allow you to adjust the project over time, as needed. For example, you might start implementing a residential energy audit and retrofit program in just one district, or start with single-family homes, then expand to multifamily homes. Other options are to first implement a pilot project or to identify and foster early adopters. This will allow you to gain experience and refine your approach before launching at a larger scale.

Other communities have found it helpful to recruit early adopters, who can not only help you test your approach but can also be effective messengers for the project. When working with early adopters, you may want to hold regular check-in meetings to help them solve the challenges they face. You can track their progress so that you have good data and results to show by the time you engage a broader audience. Asking early adopters to tell the story of how they overcame barriers to take action can help you with your outreach and communication efforts. However, it may not be appropriate to use early adopters as project "ambassadors" if the rest of your audience cannot relate to them, if they tend not to stay on message, or if they might misrepresent the project.

Case in Point

The City of Eugene implemented the Smart*Trips* program incrementally, starting with a pilot in the Harlow neighborhood, and then expanding to three centrally located neighborhoods with Smart*Trips*: Central. The program is currently being replicated in the neighboring City of Springfield since the Eugene Smart*Trips* program staff were able to secure grant funding from the State of Oregon for a regional program called Smart*Trips*: Lane. The regional program included both the City of Eugene and the City of Springfield.

Helpful Tips: Taking Care of Administrative Steps

It is important to take care of necessary administrative steps throughout all project phases, following your organization's applicable policies and procedures. Administrative steps may include the following:

- **Identify a project manager to oversee implementation and engage needed staff**. The ideal project manager will have both the capacity and the interest to achieve project success. If your organization has the capacity to do work in-house, you can identify the staff and resources necessary to complete the project. Alternatively, you may want to consider contractors or volunteers, especially trusted community leaders.
- **Acquire needed materials and services**. Your organization's procurement policies and procedures will guide your acquisition of needed materials and services. You may also need to write and issue an RFP and select a vendor from competitive bids. Visit the Obtain Resources phase for more information on securing needed resources.

Accounting for these administrative steps in your timeline will help you avoid delays in rolling out the project and staff burnout during project implementation.

Step 8. Monitor and Adjust

During project implementation, you can facilitate ongoing conversations with stakeholders to collect feedback. You may want to track performance indicators (see the Track and Report phase) to measure progress and adjust the project over time. Metrics are instrumental to building momentum and reinforcing partnerships. It is useful to translate benefits into metrics that are meaningful to your audience, such as translating cost savings into the number of nursing jobs for hospitals. EPA's Greenhouse Gas Equivalencies Calculator is a useful tool for translating GHG emissions reductions into everyday terms. It is a good idea to document project materials throughout implementation, collect and analyze outcome data, and develop stories and videos to communicate results and lessons learned to the community.

Visit the Track and Report phase for more information on how to develop an effective process to collect data, assess progress, and report on project outcomes.

Case in Point

The SmartTrips: Central program evaluated residents' shifts in travel behavior using pre- and post-program surveys that were mailed to all target area households. The survey included a one-day trip diary to record the number, transportation mode, and purpose of trips taken; opinion questions regarding attitudes about active transportation programs and travel habits; and demographic questions. The mode shift calculated from the survey data was used to estimate reductions in daily and annual vehicle miles traveled among target area households. According to survey results, the targeted areas saw a 7 percent decrease in drive-alone trips, a 22 percent increase in trips made by bicycle, and a 2 percent increase in walking trips. This is equivalent to 686,000 fewer vehicle miles per year, resulting in a reduction of 558,223 pounds of carbon dioxide annually.

SmartTrips: Central published a final report to communicate results to the target audience, partner organizations, and other stakeholders such as regional and local government officials. Using these results, the City of Eugene was able to secure funding for the Regional SmartTrips program, and is working to get regular, dedicated funding from the State of Oregon. The report documents major successes, challenges, and lessons learned for future similar endeavors in both Eugene and other communities.

Examples from the Field

Alameda County, California: Industrial Packaging Prevention and Reuse Project
A project that helps organizations to reduce waste generation by converting to more durable, reusable packing materials.

Berkeley, California: Financing Initiative for Renewable and Solar Technology
A program that allows property owners to borrow money from the city's sustainable energy financing district to install solar photovoltaic electric systems.

Baltimore, Maryland: City Non-Profit Greenhouse Gas Reductions Program
A program through which undergraduate students receive training and conduct energy assessments for local non-profit organizations.

Pittsburgh, Pennsylvania: Green Workplace Challenge
A friendly challenge program where businesses and property owners receive recognition for sustainable actions and achievements.

Salt Lake City, Utah: Sustainable Transportation for a Sustainable Future
A former Climate Showcase Communities program that used community-based social marketing to reduce vehicle miles traveled and accompanying emissions. A toolkit is available to help organizations seeking to replicate the program.

Franklin County, Ohio: Electric Vehicle Infrastructure Project
A project to install 1,000 charging ports in public stations and workplaces in and around Franklin County, in partnership with a foundation grant.

Tools and Templates

EPA's Tool Finder for Local Government Clean Energy Initiatives
A search tool that helps local government staff screen tools and resources designed to measure impacts of clean energy programs and policies.

EPA's Green Power Partnership Publications and Resources
Information on green power purchasing and how to get involved in the Green Power Partnership, a voluntary program that encourages organizations to use renewable energy.

ENERGY STAR Portfolio Manager
A no-cost, interactive energy management tool that allows you to securely track and assess energy and water consumption across your building portfolio.

ENERGY STAR Battle of the Buildings Competition: Build Your Own Battle
Communication materials that provide information on energy efficiency and how to get involved with ENERGY STAR, including sample event ideas and promotional items to set up your own ENERGY STAR Battle of the Buildings competition.

ENERGY STAR Home Energy Yardstick
Tool that provides a simple assessment of one home's annual energy use compared to similar homes in the country.

Further Reading

EPA's Effective Practices for Implementing Local Energy Programs
A series of 19 tip sheets based on direct feedback from EPA local government grantees; the tip sheets cover topics such as incentive techniques and award and certificate programs.

ENERGY STAR Energy Efficiency Competition Guide
A guide that provides step-by-step guidance on how to set up and run an energy efficiency competition.

DOE's Solar Powering Your Community: A Guide for Local Governments
U.S. Department of Energy guide that provides a range of field-tested policy and program options to assist local governments and stakeholders in building sustainable local solar markets.

Fostering Sustainable Behavior, Community-Based Social Marketing
Resources on promoting sustainable behaviors, including the book *Fostering Sustainable Behavior* by Doug McKenzie-Mohr; a searchable databases of articles, case studies, and strategies; and a discussion forum.

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Track and Report

Tracking and reporting progress is an important part of demonstrating the value of public projects. Tracking progress can help communities:

- Assess project performance and success
- Identify specific areas for improvement
- Monitor local trends
- Make informed decisions about future goals.

Public reporting, in addition to demonstrating accountability to the community, can help:

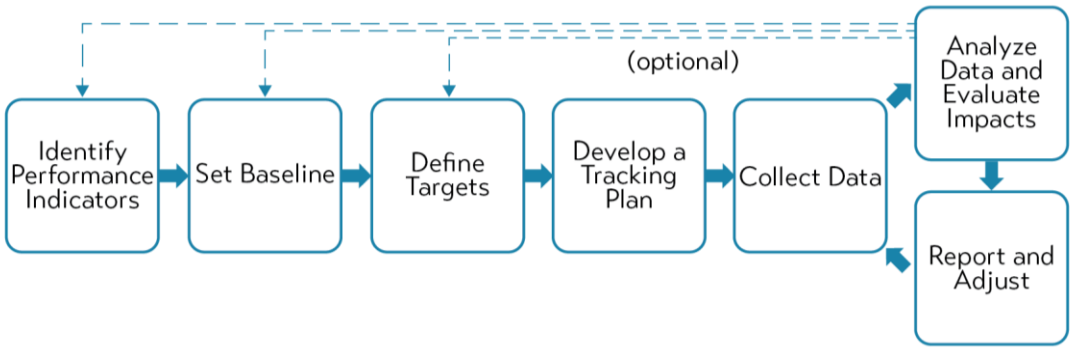
- Generate interest in a project
- Improve project management
- Demonstrate progress
- Attract political and financial support.

The steps presented in this phase walk you through developing, tracking, analyzing, and reporting on performance indicators. This approach shows how a combination of quantitative and qualitative indicators can support a variety of projects.

Key Steps

The exact process for tracking and reporting will vary by project and community. This guidance outlines several key steps that are likely to be part of any tracking and reporting process (see Figure 11). Individual communities may find some steps more relevant than others. The final three steps in the process—collect data, analyze data and evaluate impacts, and report and adjust—are a continuous loop to track progress and adjust as needed.

Figure 11. Overview of the Key Steps for Project Tracking and Reporting



Step 1. Identify Performance Indicators

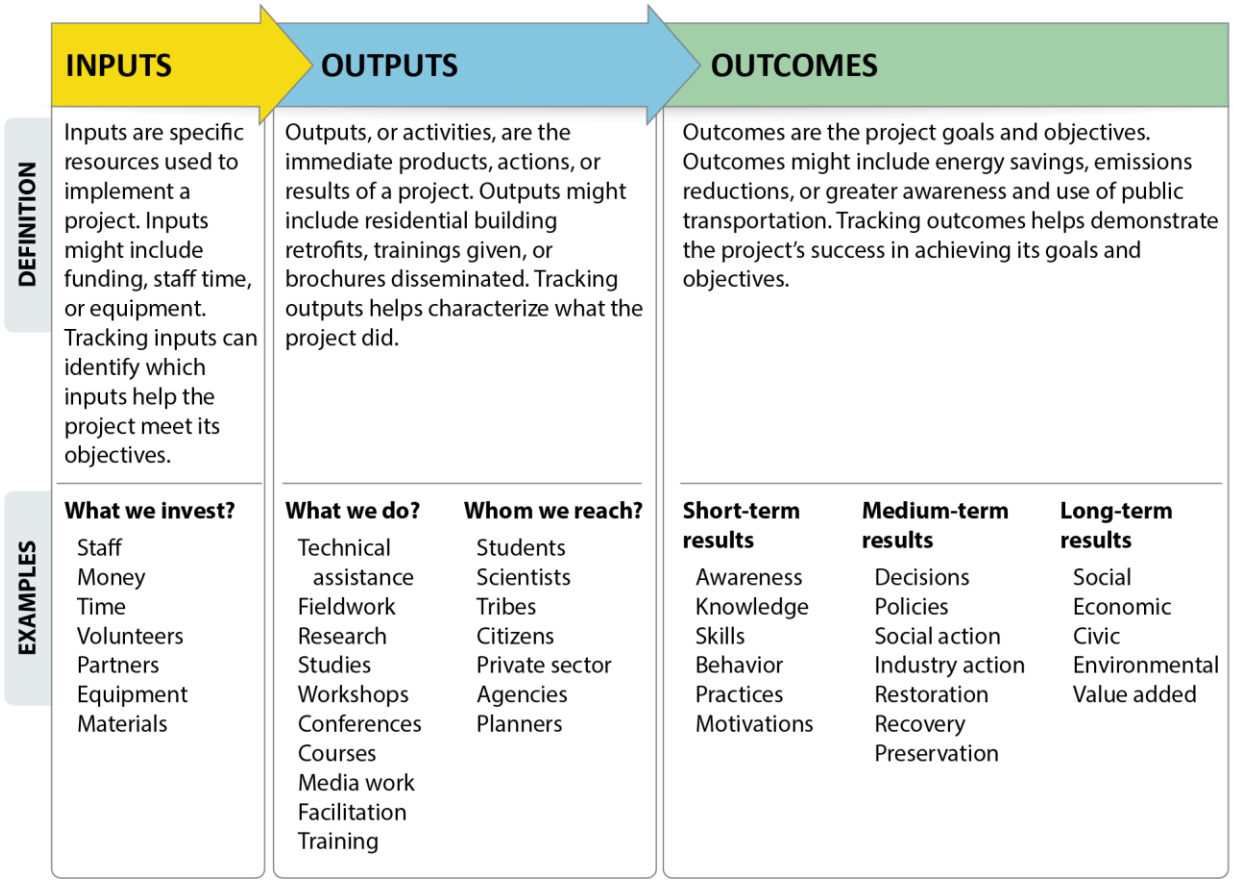
Performance indicators measure progress toward overall project goals and objectives. Before identifying performance indicators, it is useful to revisit the high-level project goals determined during the Set Goals and Select Actions phase to make sure that the performance indicators and overall tracking and reporting efforts align with the project's intended accomplishments.

This step is divided into four sub-steps: developing a logic model to organize your thinking about performance indicators; brainstorming a comprehensive and creative list of potential indicators; assessing the relevance, measurability, and accessibility of possible indicators; and selecting the list of indicators that best fit the project. This process encourages you to cast a wide net to consider some indicators that may be less obvious and to conclude with a discrete list of indicators to measure the project's success. While brainstorming, assessing, and selecting indicators, communities benefit from thinking about the narrative they hope to tell: what metrics and data could strengthen the story and make it more compelling for the intended audience?

Develop a Logic Model

Developing a logic model may be helpful in organizing your thinking about performance indicators. A logic model encourages organizations to define the inputs, outputs, and outcomes of a project (Figure 12). Using a logic model to frame the project provides a foundation for developing the tracking and reporting plan for the project. In fact, projects receiving federal funding may be required to provide a logic model and report on inputs, outputs, and outcomes.

Figure 12. Logic Model on Inputs, Outputs, and Outcomes



For detailed guidance on how to develop a logic model, visit EPA's Online Logic Model Course.

Brainstorm Indicators

Communities typically start with a brainstorming session to develop a comprehensive and creative list of potential indicators after reviewing the project goals. Potential indicators can be quantitative or qualitative. Although it is a best practice for the indicators that are eventually selected to relate to the project goals, it is important for the brainstorming session to be broad and not eliminate potential indicators. It is useful to consider indicators that are project outputs, such as number of residential building retrofits, and outcomes, such as energy savings and emissions reductions (see Figure 12 for more information about project outputs and outcomes).

Communities have found it useful to be deliberate and inclusive when deciding who participates in the brainstorming session. If representatives from all aspects of the community are not included in the session, you may miss key metrics (see Helpful Tips: Equity Indicators).

The following list provides some example indicators for projects to increase community sustainability:

- Number of people who participated (e.g., in a bike-to-work campaign, in a residential solar panel installation project, in an event)
- Amount of waste being diverted from the landfill through recycling and composting programs
- Percentage of residents who walk or use transit
- Number of presentations or trainings conducted
- Improved scores or ratings of knowledge from a presentation or training
- Number of people familiar with a project or concept
- Participation in recycling
- Number of urban trees planted
- GHG emissions
- Success in passing legislation
- Number of energy-efficient light bulbs distributed
- Aggregate water use or energy use in a region
- Square footage, number, or percentage of green roofs or cool roofs installed
- Small, disadvantaged, women-owned, or veteran-owned business participation in clean energy procurement or programs

Helpful Tips: Equity Indicators

Local governments may use equity indicators to ensure that their energy and environmental programs benefit everyone in the community by tracking and measuring the social impacts of such programs. Equity indicators can be used to measure the impact of a new program or track an existing energy and environmental policy. For example, the California Energy Commission used three indicators to measure the progress of energy programs for low-income residents and disadvantaged communities:

1. **Access.** Increase access to clean energy, high-quality jobs, contracting opportunities for small businesses, and non-debt financing offerings
2. **Investment**. Increase investment in technology development, funding, infrastructure, emergency preparedness, technical assistance, and local capacity building
3. **Resilience**. Improve energy-related resilience against grid outages, increasing energy prices, and unreliable energy

For more information on California's energy indicators, see the California Energy Commission's Energy Equity Tracking Report. Establishing equity indicators can also be an effective way to facilitate dialogue between decision-makers and underrepresented community members.

Assess Indicators

After developing a broad list of indicators, the next sub-step is to determine which indicators are valuable and feasible to measure. Good indicators have three essential qualities: they are relevant, measurable, and accessible.

- **Relevant**: Is the indicator useful in determining if the project goals are being met? Is it programmatically important? Is it relevant to the audiences you will be sharing your results with?
- **Measurable**: Is it possible to track progress? If the indicator is qualitative, is it possible to rank the evaluation (e.g., high/medium/low or excellent/good/satisfactory/needs improvement) so improvements can be tracked? Does it provide an accurate measure of a task? Can it be defined in clear terms? Will it be consistently measured the same way by different observers?
- **Accessible**: Is the project team able to obtain the necessary data for this indicator at intervals appropriate for the project goals? Barriers to accessibility may include data privacy, inadequate resources to collect the data (e.g., staff time, technology), or highly aggregated data that reduce usefulness.

The following is an example matrix that evaluates these qualities for sample performance indicators identified during a hypothetical brainstorming session of a project designed to increase the use of public transit and decrease trips in single-occupancy vehicles (Table 7). The matrix is not exhaustive, and it is intended for illustrative purposes only.

Table 7. Example Matrix for Evaluating Sample Performance Indicators

Indicator	Relevant	Measurable	Accessible	Include
Public awareness of transportation options	Yes—One of the **project goals** is to increase the accessibility of alternate modes of transportation.	Yes—Qualitative measurement that can be surveyed.	Yes—The project team could develop a survey to ask residents about their awareness of transportation options.	**Maybe**—The metric is relevant, measurable, and accessible.
Ridership—number of bus rides per day originating in a specific neighborhood	Yes—The change in the number of bus rides is one of the **project goals.**	Yes—Because riders pay a fare when they board the bus, it is possible to count the number of rides.	Maybe—The department of transportation currently collects data only on the number of rides per bus per day but is exploring bus-stop data collection opportunities.	**Maybe**—If there is an easy method for accessing the data. The bus operating agency may be able to access or deduce this information.
Vehicle miles traveled in private vehicles	Yes—One of the **project goals** is to decrease car trips.	Maybe—This is a frequently used metric, but it is difficult to measure on the neighborhood level.	No—Collecting these data within the specific neighborhood would be overly burdensome for this project.	**No**—Without an easy way to access the data, this is not a feasible metric for this project.

Select Indicators

Once you identify a set of viable (relevant, measurable, and accessible) performance indicators, the next step is to select the indicators that best fit the project. A good set of indicators will narrate a story of success or precisely guide the project team in adjusting the project to optimize future success.

The final list of indicators should be sufficient yet succinct. Too few indicators will provide the project team with limited information. Too many indicators will be burdensome and deter regular tracking and reporting. It is better to track fewer indicators consistently than to set an unrealistic tracking plan and end up with inconsistent or incomplete datasets.

For more information about selecting indicators, see EPA's Sustainability Analytics compendium, which provides detailed information and guidance on science-based assessment tools and approaches available to support sustainable decisions.

Step 2. Set a Baseline

The baseline and base year will be the basis of comparison for the project. The baseline establishes the "before" project performance in the base year, and allows you to compare performance, such as energy use, before and after the project. Success will be measured by the difference in performance from the base year.

When selecting a base year, consider the following factors:

- Is there a significant year that would be logical for the base year, such as the start of a project or the passage of a policy? It is a good practice for the base year to correlate with goals, commitments, or another significant change.
- Are data available for that year? You may only be able to confirm the base year selection after you begin to collect data and confirm that data are available.
- Is the year "typical" for the community, such as no unusual weather or economic conditions?

As an example, the West Chester Area School District in Pennsylvania selected a base year of 2008 because the Student Conservation Corps program started in 2009 and the school district wanted to compare program implementation years to the pre-implementation year.

Step 3. Define Targets

A primary purpose of tracking and reporting indicators is to measure the project's success. To measure success, it is first necessary to define what success looks like for the project. Local governments have used targets for indicators to collectively demonstrate the success that their communities want to achieve.

As part of the Set Goals and Select Actions phase, the project team may have already established specific project goals that serve as high-level targets (see Helpful Tips: Aligning Project Goals and Targets). For example, one project's goal may be to install solar panels on 30 commercial buildings; another project's goal may be to increase the rate of solar panel installation on commercial buildings by 50 percent over the number of installations during the base year; and a third project may have a goal of decreasing GHG emissions by 50 percent from the base year through solar panel installation.

Helpful Tips: Aligning Project Goals and Targets

It is helpful to revisit the project goals over time and establish more specific targets that reflect your selected indicators and align with the overall project goals. For example, you might set targets of holding three workshops on solar options and reaching 75 businesses through workshops or industry events. If a project goal has a long time horizon (e.g., decreasing GHG emissions by 2050), it may make sense to set incremental targets that will demonstrate progress. Targets set in this step will likely represent short-term, incremental, or smaller-scale targets to help keep the project on track to achieve the long-term target.

As noted in the Set Goals and Select Actions phase, the following questions are useful to consider when setting targets:

- What regulations, if any, will you want to consider in setting the target?
- What is the long-term target of the project, and when will it be achieved?
- What short-term targets would keep the project on track to achieve the long-term target?

As an example, the City of Seattle Climate Action Plan has an extensive list of indicators, each with an associated target; see Table 8 for an example of the targets associated with each indicator. The indicators are used to measure the success of various sectors (performance areas).

Table 8. Climate Action Outcome Indicators from Seattle City Action Plan

Sector		Indicator	Target
Transportation	**Passenger**	Passenger Vehicle Emissions (Million Metric Tons CO_2e)	82% Reduction
		Vehicle Miles Traveled	20% Reduction by 2030
		GHG Emissions Intensity of Travel (GHG Emissions per mile of Seattle Vehicles)	75% Reduction by 2030
	Mode Share	Center City Commute Trip	Trend away from single-occupant vehicles
		All Trips in Seattle	Trend away from single-occupant vehicles
	Transit	Ridership	Increase in transit mode share and ridership
		Service	Increase in transit service hours and service levels on Seattle's Frequent Transit Service network
	Bicycling	Ridership	Triple the amount of bicycling from 2007 levels by 2017
	Safety	Crash Data	Eliminate serious injuries and fatalities on Seattle streets by 2030

Considering historical data helps with setting realistic targets. Local organizations have found it is best to have at least two years of historical data on which to base targets.

Although it is helpful to have targets for each indicator, some communities have found it valuable to also track indicators that do not have specific targets associated with them. In this way, communities can understand trends that help tell a story. For example, the City of Berkeley's car share indicator does not have a target, but this indicator helps the city understand trends in vehicle miles traveled and associated GHG emissions.

Step 4. Develop a Tracking Plan

After identifying indicators, the next step is to develop an efficient, consistent, and reliable process for data collection and management. Below are some considerations for developing a data collection protocol. You may want to allocate resources, such as staff and time, to the following activities:

- **Determining who will be responsible for collecting data for each indicator and when they will collect the data.** Communities have found it useful to identify a single tracking manager who will compile the data, once collected. The tracking manager may also be responsible for ensuring all data security measures are met.
- **Maintaining the highest degree of individualized data possible without compromising security and privacy** (it is easier to aggregate data in the future). It is essential to remove all personally identifiable information—such as names, addresses, phone numbers, date of birth—when conducting analysis and reporting results. If you need unit-specific information (e.g., household or person), you can assign each unit an ID that is correlated with, but not directly connected to, personally identifiable information. Best practices include keeping data on a secure computer or server and using password protection and limiting access to avoid the misuse of data. You may want to consider consulting with your legal staff to make sure you are complying with all local laws and policies.

- **Determining whether you can integrate data collection into an existing process or standard operating procedure for each indicator.** For instance, if the accounting department records the amount of money spent on electricity in government buildings each month, can the process be expanded to record the energy (in kilowatts) consumed each month?
- **Considering the use of an existing tracking tool or template** to compile and organize data. If it is not possible to integrate tracking into an existing system or template, you can develop a database or spreadsheet to track the indicators. Talking to the people and organizations that will provide data, such as utilities, transportation departments, or water facility managers, can help you understand what information they have available and in what form they can provide it. In that way, you can develop a system and template to accommodate the available data. Visit Tools and Templates for examples of tools you can use to compile and organize data.
- **Minimizing the burden of data requests** and making it easier for someone to give you the necessary information. To ensure that they get the required data, local governments have found it helpful to provide a template for people to populate (such as a spreadsheet with labeled rows and columns). However, you may still need to take data in their raw form and enter them into your template or system yourself.
- **Establishing a reminder to begin collection in the future,** if possible, for data that are not currently available for a particular metric or are limited in their reliability.
- **Carefully documenting all data sources,** including points of contact for collecting the data. This will help you remember what you did when you return to the data later; allow you to provide credible documentation if requested from stakeholders; and make it easier for you or others to collect data over time to measure your progress.
- **Keeping track of all units of measurement and following up if the units in a dataset are not clear**. It is helpful to include a unit conversion sheet for those who are entering the data for you. For energy data, for example, you would likely need conversions for therms to BTUs, CCF to BTUs, and kWh to BTUs.
- **Considering what data may be helpful in the future**. It is a good idea to collect related data if they are readily available, even if you are not sure yet how they may be used.
- **Exploring novel approaches for gathering data.** Crowdsourcing data (collecting data from volunteer reporters) through an online portal or smartphone application is one novel approach that can produce large amounts of data that might not otherwise be available. For example, for a project to encourage alternate transportation options, a local government might offer a webpage where participants can log how many bus trips, bike trips, or walks replaced car trips. The Utah Department of Transportation developed TravelWise to help individuals, businesses, and organizations find alternatives to driving alone and record their use.
- **Setting a schedule for data collection and analysis of each metric.** You can avoid expending extra effort by only collecting data as often as is useful. For example, some data (e.g., energy use) may be available both monthly and annually, but annual data suffice for tracking progress. How often will you evaluate and report project results? Evaluation typically occurs at fixed intervals (e.g., mid-point of the project or annually), even when tracking is continuous. The project team may select ongoing measurements of several indicators and a periodic snapshot that is more comprehensive. In these cases, the scope of data collection for the base year and the periodic snapshots may exceed the scope of the regular data collection.
- **Consulting resources that provide more specific information about how to track indicators related to the project.** See the Resources for Tracking and Reporting box for detailed information on establishing a baseline and tracking progress related to several issues.

Communities have found it useful to complete these steps prior to collecting data. It may be necessary or advantageous to revisit these steps periodically. As the project is implemented, you may want to consider adding or adjusting goals, updating the indicators to reflect newly available data, or making targets more ambitious to keep pace with new technology and project advances. It is also good to be aware of desired datasets—a wish list of datasets—that may not exist in the initial stages, but that might become available in the future.

Step 5. Collect Data

Once you have established tracking procedures and selected the base year, you can begin collecting data. Communities have found it useful to start by collecting data for the base year and then commence regular data collection based on the established tracking plan. This step is the first in a process that will be continually repeated.

Step 6. Analyze Data and Evaluate Impacts

Communities have gained valuable lessons by analyzing data about their projects at regular intervals. You can draw "big-picture" lessons from the results to understand elements of the project that have been particularly successful or have room for improvement and ask questions such as:

- How much progress has been made between the baseline data and the post-implementation data?
- Are the results on track for achieving intermediary and long-term targets?
- What other factors or projects could have influenced the change between the base and post-implementation year? Since it is difficult or impossible to hold other variables constant, you can consider possible external influences in the analysis and mention them in reporting.
- Do the data support the indicators identified in Step 1? Why or why not?

You may want to consider engaging your community and stakeholders in guiding the analysis questions to ensure the outputs meet their needs and speak to what is important in the community. Documenting the process and all assumptions will allow the analysis to be replicated in future years. It is advisable to record the data analysis in a format that you can use in Step 7.

You can revisit Step 1, Step 3, and Step 4, as needed. You might determine that adjustments to the narrative or targets are necessary (were they unrealistic?) or that adjustments to the measurements are appropriate (were they measuring the wrong thing?). It is a good practice to justify any changes to either the narrative or the indicators. While it may be wise to refine and improve the measurements, it is not advisable to rewrite or redefine the goals and targets completely because this may detract from the initial project goals and the validity of the assessment. If you add indicators and the data for the original base year are not available, it will be necessary to define a new base year for a new measurement.

Step 7. Report and Adjust

Local governments have used the results of data analysis in two primary ways: to report findings and to adjust actions. Reporting findings is an effective way to solicit public, political, and financial support for the project. The following questions can help you establish a useful approach to reporting results:

- **Who is the target audience for the report?** The target audience may be decision-makers who will vote on related legislation or technical experts who will assess how to design subsequent projects. You can include the indicators you identified in Step 1 for this audience.
- **Who is the target audience for outreach?** Is it different from the report? It may include the general public, who can be complimented for participation or encouraged to engage in the ongoing project. Again, you can include the appropriate indicators, as identified in Step 1.
- **What information can you make available?** You may want to consider making the data tracked by this process, as well as one or several reports, available to the public. The reports might include a high-level executive summary and a detailed assessment, depending on the target audience.
- **What method or methods are appropriate to reach the target audience?** A variety of methods can effectively reach the intended audience: social media, local news outlets, bus posters, and phone calls to city council members, among others.
- **How can you frame the information to best reach the target audience?** For example, a simple set of graphics alone might meet the needs of a large group of stakeholders, but a detailed report might be more effective for a group of technical experts. Reports can be produced in a printed format as done by Philadelphia's Greenworks, or they can be made available online in a more interactive fashion as done by San Jose's Green Vision.
- **How often will you schedule updates to the reported information?** For example, reports may only need to be updated every few years with new information, but websites and articles may need to be updated more frequently.
- **Can you use the data for any relevant budget or strategic planning processes?**

You can use indicators not only to gain project support, but also to identify the project's strengths, weaknesses, and opportunities. The detailed information helps to identify areas for improvement or parts of the project that would be valuable to replicate. It is helpful to consider the following questions:

- What parts of the project were most successful? What contributed to the success?
- What parts of the project were least successful? What detracted from the success (e.g., inadequate staff time or resources)?
- How can the actions be improved?
- Can you replicate or adjust elements of one successful action to improve the success of another?

Based on the answers to these questions, you may want to consider adjusting project activities and continuing to track results to see the impact of the adjustments.

Finally, if you obtain funding or financial support for your project, you may need to report how the money was used. In some cases, the funders may request that you report the results of the indicators.

Resources for Tracking and Reporting

Greenhouse gas emissions

- See the Develop GHG Inventory phase.
- Local Government Operations Protocol for GHG Assessments—Provides guidance on calculation methodologies, emission factors, and other aspects of inventory development for local government assets and operations. Developed in partnership by the California Air Resources Board, the California Climate Action Registry, ICLEI-Local Governments for Sustainability, and the Climate Registry.
- ICLEI's U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions—Provides guidance on calculation methodologies, emission factors, and other aspects of community-wide inventory development.

Criteria air pollutant emissions or air quality

- EPA's AirData—Compiles data from EPA's Air Quality System monitors around the country, providing air quality statistics, pollutant concentration maps, and other tools.
- EPA's Emission Inventory Improvement Program—Provides protocols and methodologies for completing a criteria air pollutant emissions inventory.
- EPA's Assessing the Multiple Benefits of Clean Energy, Section 4.2.1—Describes steps for developing and projecting a baseline emissions profile, including GHGs and criteria air pollutants. This resource is directed primarily at states, but has information that can be applicable for local governments.
- **Your state air agency's criteria air pollutant inventory**—Typically created every three years as part of requirements under the National Ambient Air Quality Standards.

Water use

- EPA's WaterSense at Work: Best Management Practices for Commercial and Institutional Facilities—Provides guidance on assessing facility water use.

Facilities

- ENERGY STAR guidance on benchmarking energy use for facilities—Provides information and tools on measuring building performance, including Portfolio Manager.

Purchasing

- EPA's Recycled Content (ReCon) Tool—Evaluates the GHG benefits associated with increasing the recycled content of purchased materials.
- GHG Protocol's Corporate Value Chain (Scope 3) Accounting and Reporting Standard—Provides a protocol for companies to estimate GHG emissions associated with their value chains. Can be informative for local governments evaluating impacts of purchasing decisions.
- Carnegie Mellon University's Economic Input-Output Life Cycle Assessment—Estimates the relative impacts of different types of products and materials throughout the supply chain.
- Greenhouse Gas Emissions Associated with Purchasing of Goods and Services by the City of Eugene, Oregon—Provides an example of how one city estimated these emissions.

Economic characteristics

- U.S. Bureau of Labor Statistics' Approach for Measuring Green Jobs—Provides examples of what qualifies as a "green" job.
- Your local chamber of commerce or similar organization—May have information about employment by industry.

Other

- EPA's Tool Finder for Local Government Clean Energy Initiatives—Provides a query to help local government staff screen tools and resources designed to measure impacts of prospective programs and policies.

Examples from the Field

Philadelphia, Pennsylvania: Greenworks Philadelphia
An ambitious plan, with accompanying progress reports, that sets 15 sustainability targets in the areas of energy, environment, equity, economy, and engagement.

Seattle, Washington: The Seattle EcoDistrict
An example of how to develop, measure, and report indicators in a way that is visually appealing and easily accessible to the public and decision-makers.

San Jose, California: Green Vision Goals
A website that demonstrates how San Jose is publicly communicating progress toward 10 discrete goals related to its sustainable community plan.

Southern Tier, New York: Cleaner Greener Southern Tier
A sustainability plan that spans eight counties in New York State and identifies 18 indicators to measure progress in nine performance areas. Call-out boxes highlight the 2010 base year and 5-year and 20-year targets.

Massachusetts: GreenDOT Implementation Plan
A plan to achieve the Massachusetts Department of Transportation stewardship goal that outlines sustainability initiatives, goals, tasks, indicators, implementation time horizons, and responsible divisions.

Tools and Templates

EPA's Tool Finder for Local Government Clean Energy Initiatives
A search tool that helps local government staff screen tools and resources designed to measure impacts of clean energy programs and policies.

EPA's Waste Reduction Model
A tool that helps solid waste planners and organizations track and voluntarily report GHG emissions reductions from several different waste management practices.

ENERGY STAR Portfolio Manager
A no-cost, interactive energy management tool that allows you to securely track and assess energy and water consumption across your building portfolio.

State and Local Transportation Calculators and Monitoring Tools
An EPA website that links to several modeling tools including the MOVES Model, Airport Ground Support Equipment Model, Business Benefits Calculator, SmartWay FLEET Performance Model, and Diesel Emissions Quantifier.

Further Reading

EPA's WaterSense at Work: Best Management Practices for Commercial and Institutional Facilities
Guidance on assessing facility water use.

EPA's Local Program Model Design Guide
A guide that includes a section on evaluating and evolving your program model and an appendix on performance indicators.

U.S. Bureau of Labor Statistics' Green Jobs Overview
A website that describes the bureau's approach to measuring green jobs.

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