LEED for Communities

A How-to Guide for Initial and Continued Certification

Paul Barber, Benjamin Buck, Megan Flory, Louisa Ulrich-Verderber

Table of Contents

Introduction

This is a practical, hands-on guide outlining the steps necessary to collect and input data into the Arc Platform for initial and continued certification of a community that has already been registered in the USGBC LEED for Communities (LFC) sustainability program. It is intended for use by rural or small town communities but has information and suggestions that may be useful for any community or city seeking LFC certification. This guide will cover potential data sources for the 14 Performance Metrics and how to navigate them; what calculations may be necessary and how to do them; and, when there is no uniform method of collecting and processing data, this guide will provide a starting point for thinking about how to approach the problem. When appropriate, illustrations have been provided from the case study of the New York Olympic Region (NYOR), a rural, multi-jurisdictional, tourist-centric community in the Adirondack Park. Guidance on how to properly document your work, how to use the Arc Platform, and general best practices are also indicated.

It must be noted that the instructions and the steps provided in this guide may make data collection for the metrics seem much more simplified and straight forward than the process will be. Depending on the availability of data, which parties are providing data, and numerous other community-specific characteristics, the level of difficulty of this process may vary from community to community.

Chapter 1: First Steps

Identifying Stakeholders and Key Contacts

In your community's efforts to become LFC certified, it is critical that you identify the stakeholders within the community. These may be individuals or entities already involved in the project such as town officials, community leaders, and motivated individuals; they could also be people, entities, or organizations that were not directly involved in initiating LFC, but will be affected by the process and should be kept updated about the project's progress, intentions, and goals.

Finding and reaching out to key contacts is also critical. It will often be the case in rural communities that data is not easily attainable in online databases, and may not be available in a digital format at all. In this case, is it crucial to find and contact individuals who have direct access to this information. You should identify and contact these individuals *first,* before trying to obtain any data on your own from online sources. By reaching out to these individuals, you will save the community time and resources. It is likely that most, if not all, of the required data for LFC certification already exists within your community, and it is just a matter of finding whose desk it's on.

As you progress through the certification process, be sure to keep an organized list or flowchart of the key stakeholders and contacts including their full names and primary modes of communication. This will aid your research efforts and help to facilitate communication between all parties involved in the project.

Stakeholders may include:

- Mayor
- Town Manager
- Town Selectpersons/Council persons
- Local organizations
- Residents
- Businesses
- Etc.

Key Contacts may belong to organizations such as:

- Public Works Department
- Chamber of Commerce
- Highway Department
- Regional data collection entities
- Non-profit organizations
- Etc.

Assembling Your Data Collection Team

Your data collection team may or may not include some of the key stakeholders and contacts mentioned in the previous section. Members of the data collection team should be assigned tasks that best suit their skill sets; for example, several metrics require intense calculations and therefore should only be assigned to individuals with good mathematical skills. As much as possible, team members should be selected for their knowledge and background. This can often be accomplished by requesting that the individuals with the most direct access to data be in charge of data collection.

In regions with limited resources, a partnership with a local college or university may be useful. NYOR, the community referenced in the case study for this guide, partnered with Clarkson University to share resources, experience, and expertise. This kind of partnership allows students to gain real world experience while providing the community access to labor and resources at a lower cost.

Citations and Documentation

It is crucial to track all sources of information that you use throughout the data collection phase of LFC certification. During the review process, the GBCI will be looking to verify the numbers/values which your community will submit for each metric on the Arc Platform. This means that they must have access to all sources used. Keeping good, up-to-date records of where data was retrieved from, and when, will improve the credibility of your submittal and expedite the verification process by minimizing the number of questions the GBCI will ask during the certification process.

It is recommended that all parties involved with data collection have access to your community's data tracking system, as well as any new or existing documents relating to the project. Files should be kept with a clear, consistent naming convention. By giving files descriptive names, other team members can easily and quickly find the documents they need. If your community does not have existing intranet infrastructure, collaborative web services like Google Drive are a great alternative. The data tracking system, its functionality, and its importance should be established among your data tracking team very early on in the process, before any research is done. The time committed initially to create an efficient and complete tracking system will save much time later, as you will not need to spend time at the end sorting through each individual's citations, each with their own individual organizational methods.

Chapter 2: How to Input Data Into Arc

LFC uses the software tool Arc[1] as the platform for data monitoring. Arc acts as the forum in which all the data gathered is uploaded by communities for review by GBCI and made available to other communities. As such it is equipped to receive data regarding the Performance Metrics and any additional documents necessary for Certification.

In recognition of the fact that not all of the plans a community has will immediately affect the community's Performance Score, the USGBC requires communities to choose from one of two options that will improve the Base Score. For either of these options, the base score increases as more efforts are executed.

- Option A: Submit community plans for achieving sustainability goals. The USGBC provides the following list of options:
    - Submit a plan to achieve certification for a site or building within the city using at least one of the following systems: LEED, ParkSmart, PEER, SITES, WELL, Zero Waste, or STAR Communities.
    - Submit a plan for benchmarking and performance evaluation for at least three basic services.
    - Submit a carbon reduction plan.
    - Submit a disaster preparedness and climate resilience plan.
    - Submit a plan for affordable provision of basic services, including power, clean water, waste management, safe shelter, and healthcare for people living in slums or other informal settlements.
    - Submit a biodiversity and/or watershed management and conservation plan.
    - Submit a green infrastructure plan.
- Option B: Communities commit to tracking a minimum of two Community Metrics. These additional metrics can come from the list of over 200 suggestions provided by the USGBC or can be created by the community to tailor to specific needs; communities must provide information about the data sources, methods of collection, and accuracy, in addition to identifying who specifically will be in charge of data measuring and tracking.

Information Entered into Arc

The following two tables outline the essential items that must be input into the Arc Platform for certification purposes, both initially and on an ongoing basis.

[1] http://arcskoru.com

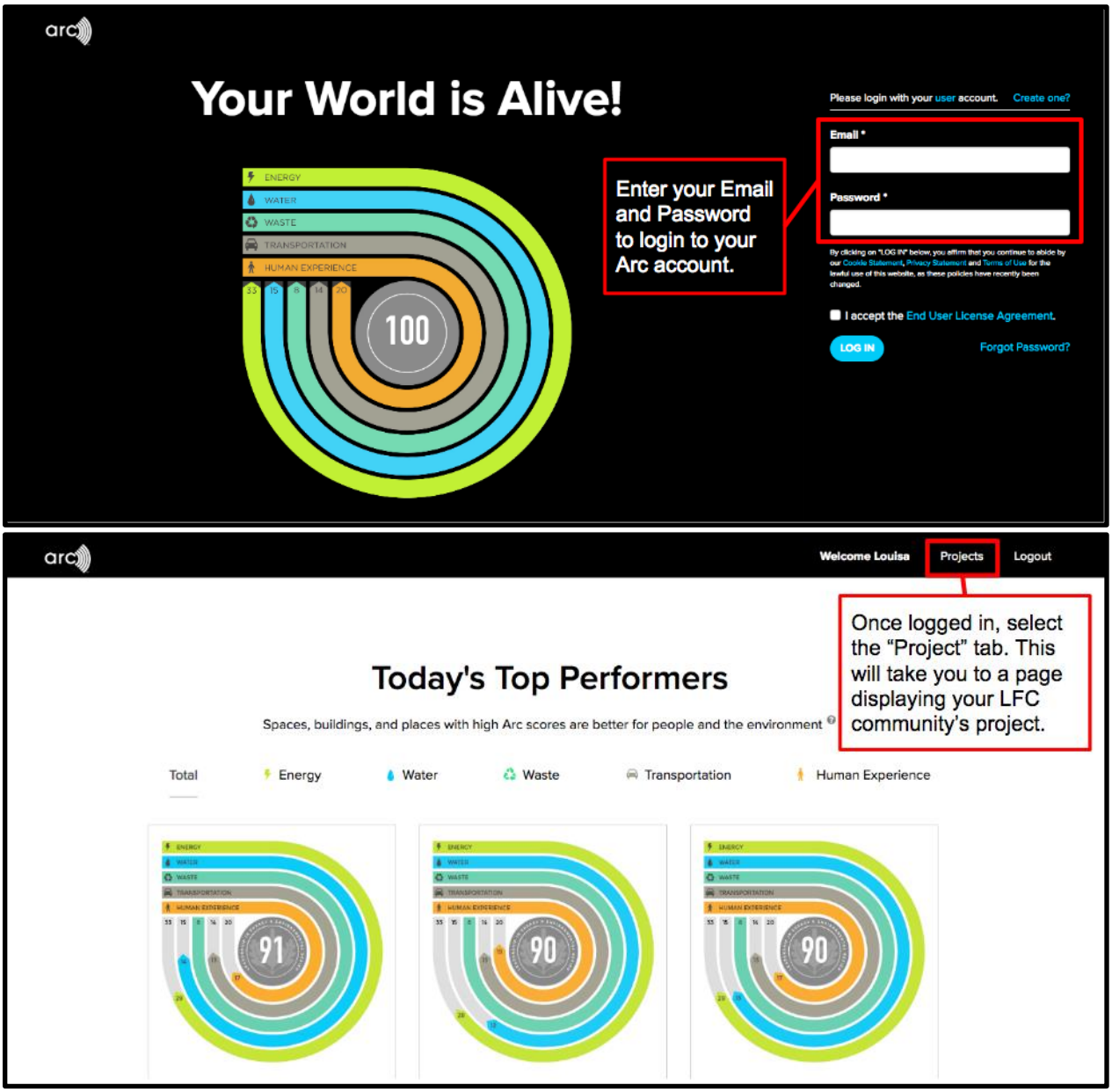
Items for Initial Certification		
Precertification Documents	Commit to Sharing Data	● In Arc, you must agree to measure and report back data for all metrics on an ongoing basis to receive and retain a score.
	Project Boundary	● You must submit a map of your community or the area that will become certified, and an explanation of the community, the land use types, and building types in the area.
	Stakeholders	● Provide a list of the stakeholders and team members involved in certifying the community and collecting data, and describe their roles, as well as a list of stakeholders involved in planning.
	Roadmap	● For communities who already have long term community plans, they must upload links to relevant planning documents as well as submit a crosswalk between their goals, strategies, and community metrics that fulfill them.
		● For communities without long term plans, you must upload a document that lists goals, strategies under each goal, and the community metric that best fulfills these goals.
	Governance	● Submit a document describing the entity that conducts policy and action decisions for the community, the level of control over infrastructure, operations, and policies, and any links to relevant community charter documents.
	Meetings	● Upload documentation describing relevant planning meetings between stakeholders. ● Include dates, times, locations, agendas, and attendees.
Supporting Documents	Process Justifications	● Describe the reliability, completeness, and accuracy of the data sources and data collection process for each metric. ● Identify the name of the metric and name of person/people responsible within the document.
	Spreadsheets (if necessary)	● Include the name of the spreadsheet within the actual document.

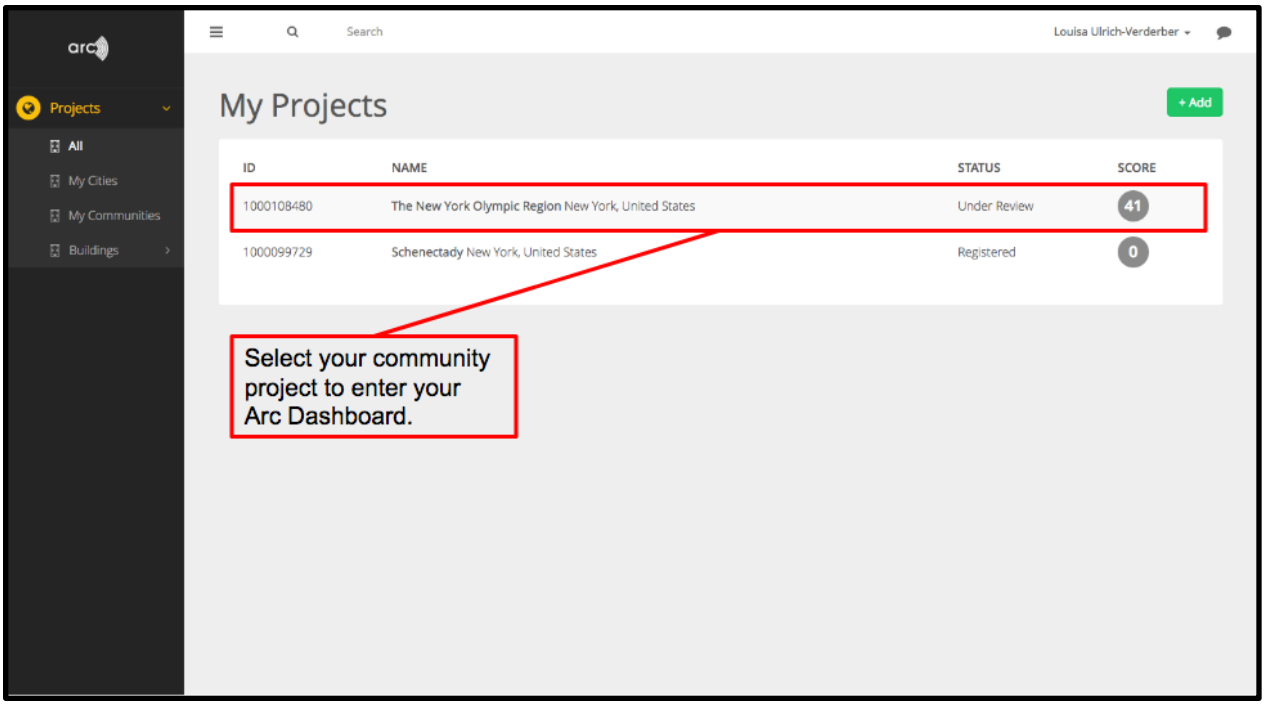
		• Submit as an Excel sheet or similar.

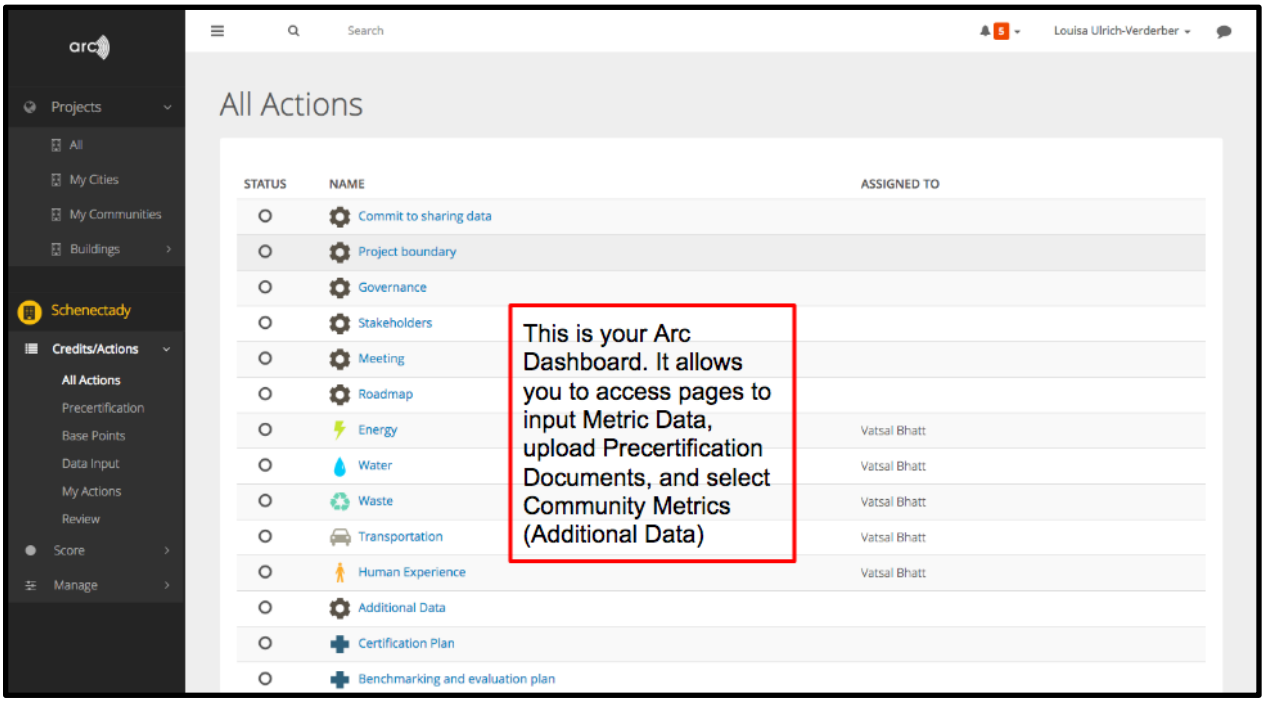
Items Submitted Continually	
Final Numbers for Performance Metrics	• The number entered into Arc Platform.
Final Numbers for Community Metrics	• The number entered into Arc Platform.
Spreadsheets (if necessary)	• Include the name of the spreadsheet within the actual document. • Submit as an Excel sheet or similar.

Navigating Arc

The website to access the Arc Platform, www.arcskoru.com, allows users to access their LFC projects, input data for certification, and view their final post-certification score. The following pages display screenshots detailing how to log-in and navigate the most important pages within the Arc program. These are the pages that will be used most frequently by communities working toward LFC certification.


Your World is Alive!
ENERGY
WATER
WASTE
TRANSPORTATION
HUMAN EXPERIENCE
100
Enter your Email and Password to login to your Arc account.
Please login with your user account. Create one?
Email *
Password *
By clicking on "LOG IN" below, you affirm that you continue to abide by our Cookie Statement, Privacy Statement and Terms of Use for the lawful use of this website, as these policies have recently been changed.
I accept the End User License Agreement.
LOG IN
Forgot Password?
Welcome Louisa
Projects
Logout
Once logged in, select the "Project" tab. This will take you to a page displaying your LFC community's project.
Today's Top Performers
Spaces, buildings, and places with high Arc scores are better for people and the environment
Total
Energy
Water
Waste
Transportation
Human Experience
91
90
90


arc
Search
Louisa Ulrich-Verderber
Projects
All
My Cities
My Communities
Buildings
My Projects
+ Add
ID
NAME
STATUS
SCORE
1000108480
The New York Olympic Region New York, United States
Under Review
41
1000099729
Schenectady New York, United States
Registered
0
Select your community project to enter your Arc Dashboard.


arc
Search
5
Louisa Ulrich-Verderber
Projects
All
My Cities
My Communities
Buildings
Schenectady
Credits/Actions
All Actions
Precertification
Base Points
Data Input
My Actions
Review
Score
Manage
All Actions
STATUS
NAME
ASSIGNED TO
Commit to sharing data
Project boundary
Governance
Stakeholders
Meeting
Roadmap
Energy
Vatsal Bhatt
Water
Vatsal Bhatt
Waste
Vatsal Bhatt
Transportation
Vatsal Bhatt
Human Experience
Vatsal Bhatt
Additional Data
Certification Plan
Benchmarking and evaluation plan
This is your Arc Dashboard. It allows you to access pages to input Metric Data, upload Precertification Documents, and select Community Metrics (Additional Data)

Chapter 3: Performance Metrics

Metric #1 - Greenhouse Gas Emissions

Metric #1 measures the emissions from stationary energy and grid-supplied electricity, steam, heating, and cooling in metric tons of carbon dioxide equivalent (MTCDE).

Finding Data

The process for finding data will depend on whether or not your community has an existing, region-specific GHG inventory. GHG emission data will likely come from one of two sources: a GHG inventory performed by the community, or the US Department of Energy's State and Local Energy Data (SLED) website[2]. The USGBC has approved the following methods and protocols for community-scale GHG inventories:

- 2006 IPCC Guidelines for National Greenhouse Gas Inventories
- Baseline Emissions Inventory/Monitoring Emissions Inventory methodology (Covenant of Mayors)
- Bilan Carbone (Association Bilan Carbone (ABC))
- Global Protocol for Community-Scale Greenhouse Gas Emission Inventories (GPC)

If the inventory was not conducted using one of these protocols, email contact@arcskoru.com for guidance and approval. Any inventory must follow the five accounting and reporting principles outlined in Section 2.1 of the GPC: relevance, completeness, consistency, transparency, and accuracy.

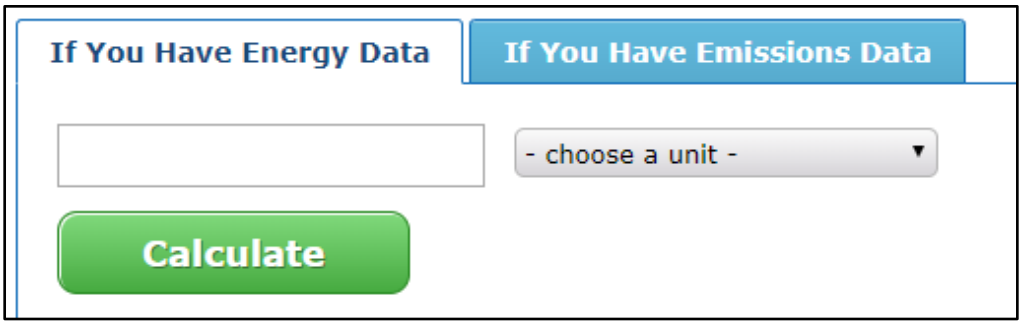
If your community **does have** an existing GHG inventory for the specific region being certified (i.e. town/city level inventory), use the data from the existing inventory.

1. Divide total emissions (in metric tons of carbon dioxide equivalent) by the population of the community

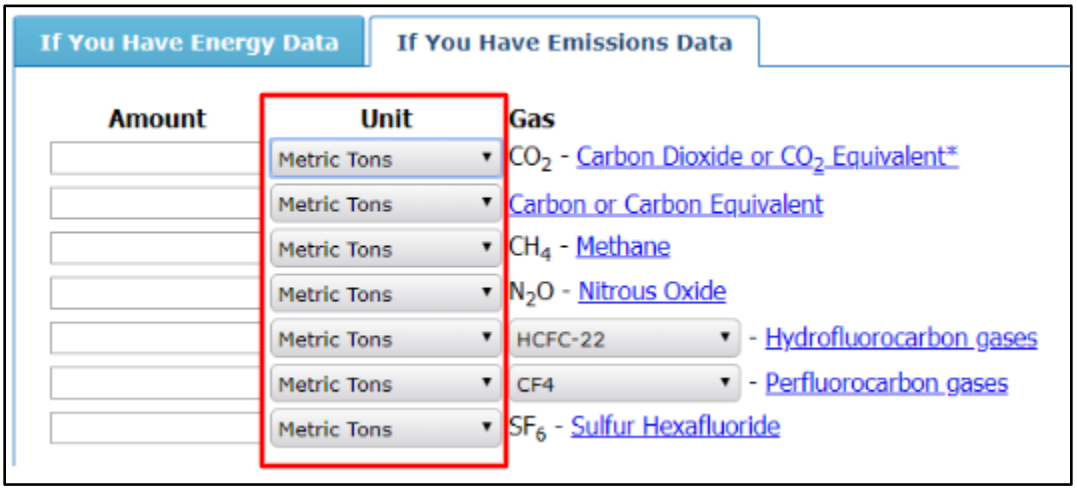
2. If the emissions are not in metric tons of carbon dioxide equivalent (MT CDE), use the EPA's greenhouse gas equivalency calculator[3] to convert the emissions (https://epa.gov/energy/greenhouse-gas-equivalencies-calculator)
    - Scroll down to find the calculator

[2] https://apps1.eere.energy.gov/sled/#/

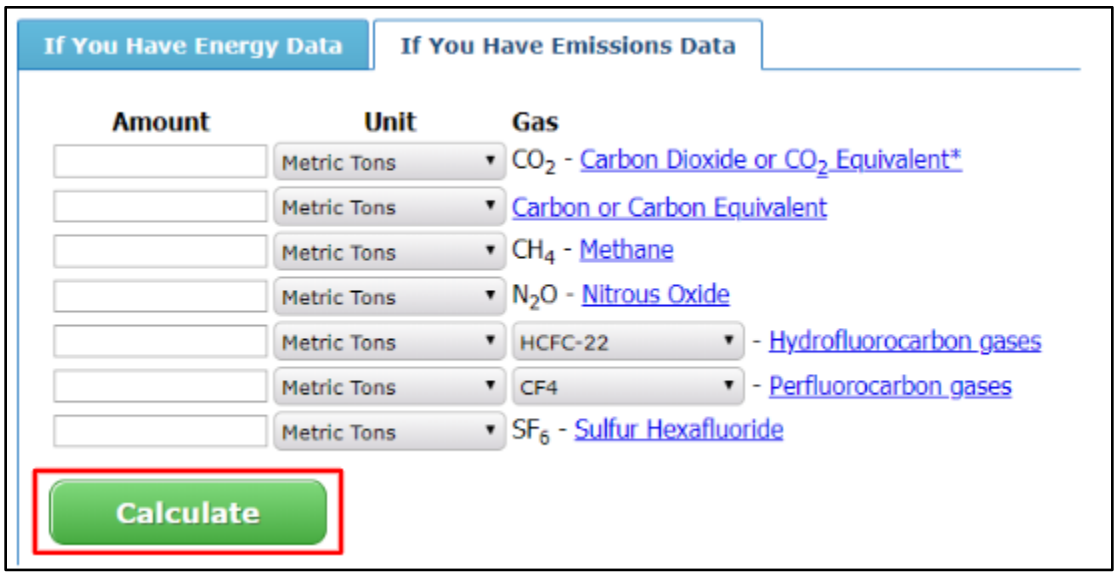
[3] https://epa.gov/energy/greenhouse-gas-equivalencies-calculator



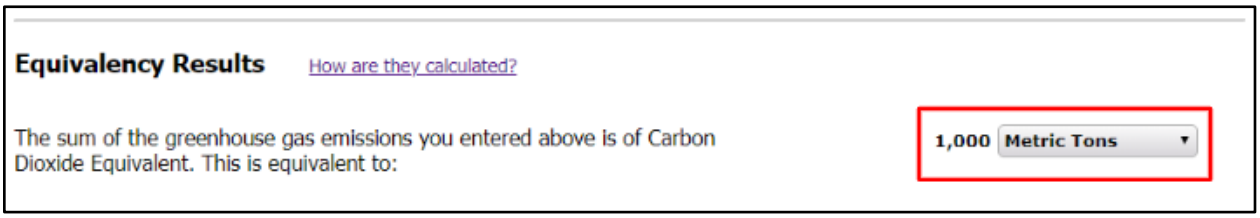
- Select the "if you have emissions data" tab and input the values from your GHG inventory (be sure to select the correct units from the dropdown menu)



- Once all the values are input and the units are correct, click "calculate."



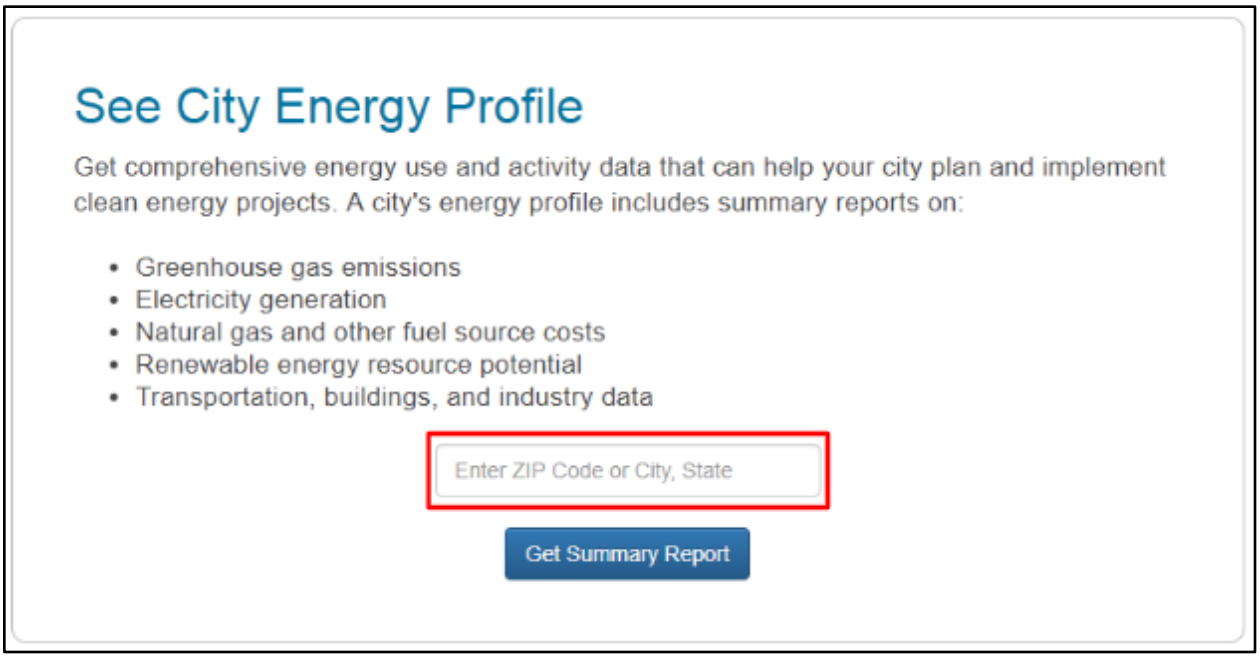
- The calculator will give you the carbon dioxide equivalent in metric tons by default; this is the number to input into Arc.



If your community **does not have** an existing GHG inventory, you will have to use an estimate to determine per capita emissions.

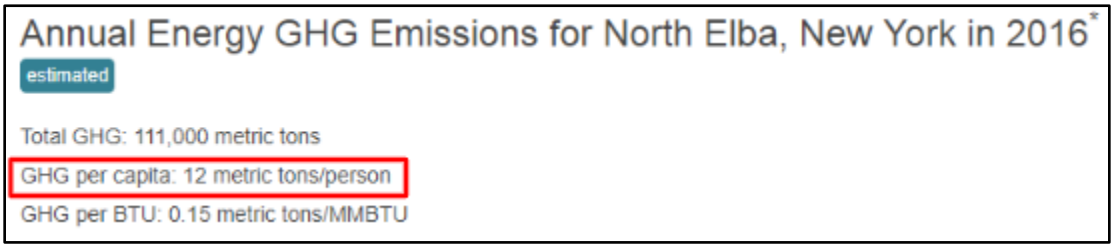
1. Go to the US Department of Energy's State and Local Energy Data (SLED) website (https://apps1.eere.energy.gov/sled/#/).

2. Search by town, city, or zip code.



3. Select the "emissions" tab.

4. SLED will provide total estimated GHG emissions as well as estimated GHG emissions per capita for a given year.



NOTE: *If any emissions are being excluded, explain why. For example, emissions from two ski resorts (Whiteface and Gore Mountains) were excluded from the NYOR GHG emissions data. Because the ski resorts have no permanent populations and are outside the contiguous geographic boundary of NYOR, it was decided that the emissions from these two ski resorts should not be included in NYOR's GHG emissions metric.*

Metric #2 - Domestic Water Consumption

Metric #2 measures the amount of domestic water a community consumes in gallons per person per year (gal/person/yr). In rural communities, this water data is likely to come from a drinking water usage report created by the municipality as well as private well estimates.

Finding Data

1. Find the source of municipal water consumption data for your community. If there are residents who do not get their water from the municipal supply, the quantity used by these residents must be measured or estimated and included in the total. Methods for estimating consumption are not formally defined, and as such may require creative solutions to be developed for your community's specific situation.
    - ***NOTE:*** *Data for NYOR was found in the Lake Placid 2017 Annual Drinking Water Quality Report. This same type of report is federally mandated by the EPA, and therefore data on municipal water consumption should be readily available for any municipality that provides water to its residents.*
    - **Example:** In the case of the NYOR LFC project, the total water usage was

calculated by adding private well estimates for residents living outside of the municipal water supply range to Village data from the Lake Placid 2017 Annual Drinking Water Quality Report, which provided municipal water usage data.

- To determine the well estimates, maximum flow rates for existing residential wells constructed after the year 2000 were obtained. The flow rates of these 70 wells were averaged to arrive upon a reasonable estimate for individual private well consumption, which was then multiplied by the total number of residences.

2. Divide the total gallons/year value by the population of the community. This will result in the desired metric number of domestic water consumption in gallons/person/year.

3. Record this number and enter it into the Arc program.

Metrics #3 & 4 - Municipal Solid Waste Generated & Percent Diverted From Landfills

Metric #3, Municipal Solid Waste Generated, is the measure of municipal solid waste produced by a community in metric tons. This metric is also used to calculate Metric #4, Percent Waste Diverted, which is input separately into the Arc Platform. This is the measure of the proportion of waste diverted (i.e. recycling) from landfills, and is measured as a percentage.

NOTE: *In the following steps, words enclosed in [brackets] indicate a value to be used in calculations.*

1. To calculate these two metrics, data should be collected from all major waste collectors operating in your community, whether this is a commercial trash collecting service, community-run trash pickups, or based on direct landfill/recycling drops.
    - **Example:** The two major waste collectors in NYOR were Casella Waste Management and the North Elba Transfer Station.

2. Contact the appropriate entity for the amount of waste they take in from your community, how much of that goes to landfill, and how much recycling they collect.
    - Other forms of diverted waste include composting, incineration, digesting, etc. Each should be accounted for to the highest degree possible.

3. To calculate Metric #3 Municipal Solid Waste Generated:

- Add together all sources for waste generation.
    - Waste Generated includes all waste including landfilled waste as well as recycled waste or waste that is otherwise diverted from landfill.
    - Make sure all data sources are using the same units. If they are not, convert relevant data so that the number entered into Arc is in *metric tons.*
- Enter [Municipal Solid Waste Generated] into Arc.

4. To calculate Metric #4 Percent Waste Diverted:
    - Add together all the diverted waste data from your community to get [Diverted Waste].
    - Divide the [Diverted Waste by Municipal Solid Waste Generated] and multiply by 100%. This is the [Percent Waste Diverted].
        - Make sure all values in this process have units of *metric tons*. It will yield a percentage.
    - Enter [Percent Waste Diverted] into Arc.

***NOTE**: Depending on what data is provided by the waste collecting companies or agencies in your community, you may be required to scale the data provided from a county/parish-level scope to community-level scope. For example, in NYOR the North Elba Transfer Station accepts waste from anyone in Essex county. To adjust the values to account only for NYOR residents, the population of NYOR was divided by the population of the surrounding county to determine the percent contribution. This percentage was applied to the Waste Generated value for each respective data source. This should be repeated for each relevant company/agency before adding the data together.*

Metric #5 - Transportation

***NOTE:** This section requires a functional knowledge of Excel, or an equivalent spreadsheet application, to perform calculations.*

Vehicle Miles Traveled (VMT) per Capita measures the amount of transportation used by a community in miles per day per person. The total VMT is the sum of VMT from roads with traffic counts, VMT on roads without traffic counts, and half of VMT attributed to residents traveling outside the region as well as visitors traveling to the region. Here is how to calculate each.

NOTE: *In the following steps, words enclosed in [brackets] indicate a value to be used in calculations.*

Finding Data

1. Obtain Traffic Count Data:
    - Traffic Counts are used as the raw data VMT is calculated from. Traffic Counts can be obtained from the state Department of Motor Vehicles (DMV) or regional equivalent organization, or from the state Department of Transportation[4].
        - **Example**: In NYOR, Traffic counts were sourced from the NYS DOT website (www.dot.ny.gov) under the Local Highway Inventory sub-section of the Highway Data Services section.
    - Data for Traffic counts are likely to be county/parish-level data, and it may be necessary to contact your data source directly in order to narrow your search for your community's traffic count data.
        - **Example**: NYOR's community-specific data was obtained by directly contacting Director of the Highway Data Services Bureau to get data specific to North Elba, NY.

2. Copy community Traffic Count data in Excel.

3. Obtain Functional Road Classification Data (FC).
    - Functional Road Classes are ways States delineate different road types (i.e. highway, streets, roads) and depending on the State a community is in, this classification system may be different.
        - **Example**: NYOR found its FC from the NY DOT in an Excel sheet of statewide Traffic Count and FC data organized by county.
            - "Vehicle Miles of Travel 2017" - Listed under Highway Data Services section and then the Highway Statistics sub-section.
    - As with Traffic Counts, this data may also be county/parish or even statewide and you may need to contact your data source directly to find community-specific data.
    - Copy the Functional Road Classification Data specific to your community into the same Excel file as Traffic Count data.

VMT on Counted Roads

1. Multiply the length of each road segment by the traffic count, which is measured in annual average daily traffic (AADT).

2. Add all the results.
    - This is the [VMT on Counted Roads].

[4] https://www.fhwa.dot.gov/about/webstate.cfm

VMT on Uncounted Roads

1. Using County Functional Class data:
    - Divide the "VMT/1000" by the "Length" and multiply by 1000.
    - Do this for each functional class.
    - This is the [Average VMT per Length of Road Inside County by Functional Class].

2. Using Community Road Data:
    - Identify all functional classifications (denoted "FC") of roads in data.
    - Find the total length of uncounted roads in each functional class.
        - **Example**: SUMIFS(Length column, Functional Class column, "= Functional Class numeric value", VMT column, "=0").
            - Do this with each functional class value.
            - Functional class value should look like this , "=9",.
            - Include all quotations.
        - This yields [Length of Uncounted Roads Inside Region by Functional Class].

3. Multiply [Length of Uncounted Roads Inside Region by Functional Class] times [Average VMT per Length of Road Inside County by Functional Class].
    - This yields [Average VMT by Functional Class].
    - Do this for each functional class.

4. Add together all [Average VMT by Functional Classes] for each functional class
        - This is the region's [VMT on Uncounted roads].

VMT Outside the Region

1. Half of travel outside the region by residents should be attributed to the region.
    - The same is true for half of travel by those visiting the region.
        - Travel should be calculated from the visitor's area of residency.

2. This is assumed to be zero by default due to the difficulty of gathering data in rural regions. If data is available or an educated guess can be made then this should not be assumed.
    - Data should be converted into miles traveled by residents (Outside VMT of Residents) and miles traveled by visitors (VMT of Visitors).
        - Add these two numbers together to get the [VMT Outside the Region].

Calculating VMT per Capita

1. Add together [VMT on Counted Roads], [VMT on Uncounted Roads], and [VMT Outside the Region].

- This is the [Total VMT].

2. Divide [Total VMT] by the region's population.
3. Enter [Total VMT] into Arc.

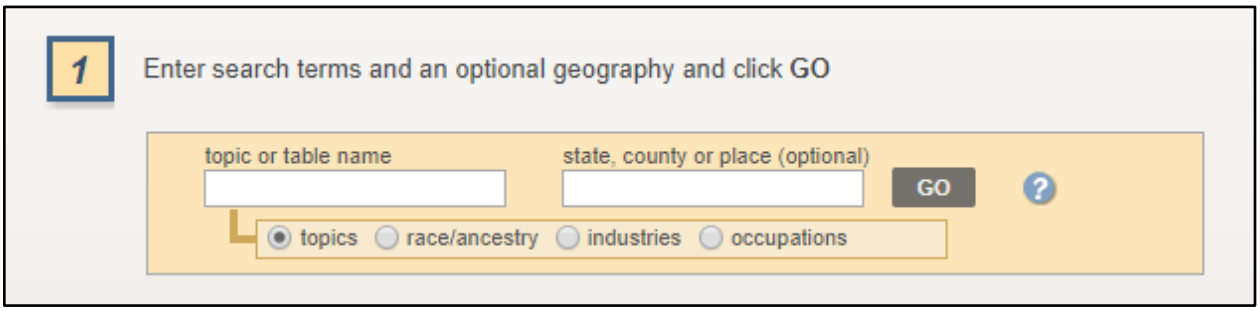
Metrics #6-11 - American Community Survey Data

Data for the human experience metrics of educational attainment, equitability, and prosperity can be found through the American Community Survey (ACS), an annual survey conducted by the United States Census Bureau, on the American FactFinder Website[5]. The American FactFinder website allows individuals, organizations, and governments to easily search for information by geographic region.

Finding Data

1. Go to the American FactFinder website (https://factfinder.census.gov/) and select "Advanced Search".

2. There are two search boxes - fill in both before clicking "Go".



3. In "topic or table name," enter Table ID given below for each metric.

4. Fill in "state, country, or place" as necessary.

5. Click "Go" or hit the enter key to search.

[5] https://factfinder.census.gov/

6. Select the table from the appropriate ACS year (1-year estimate recommended when available).

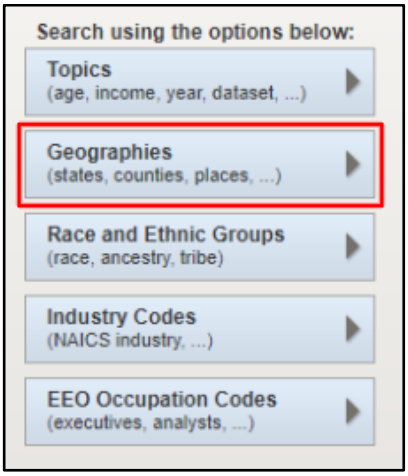
	ID	Table, File or Document Title	Dataset	About
☐	S1501	EDUCATIONAL ATTAINMENT	2017 ACS 5-year estimates	ⓘ
☐	S1501	EDUCATIONAL ATTAINMENT	2016 ACS 5-year estimates	ⓘ
☐	S1501	EDUCATIONAL ATTAINMENT	2015 ACS 5-year estimates	ⓘ
☐	S1501	EDUCATIONAL ATTAINMENT	2014 ACS 5-year estimates	ⓘ

7. Be sure to clear the table ID from "Your Selections" in the top left before starting a new search; you can leave the geography selection if your next search is for the same location.

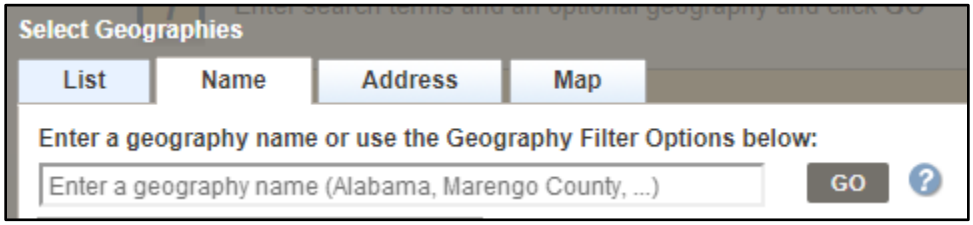
Metric	Table ID
6. Percent Population with at least High School Degree	S1501
7. Percent Population with at least Bachelor's Degree	S1501
8. Gross Rent as a Percentage of Household Income	B25071
9. Income Differential/Gini Index	B19083
10. Median Household Income	B19013
11. Unemployment Rate	S2301

***NOTE**: Rather than putting the geography of interest in the search box, the geography can be added to "Your Selections".*

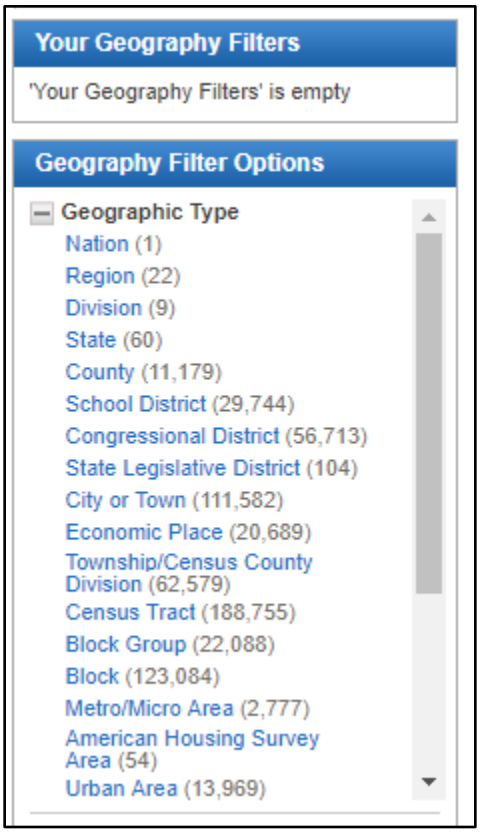
1. Select geographies from the options in the left sidebar.



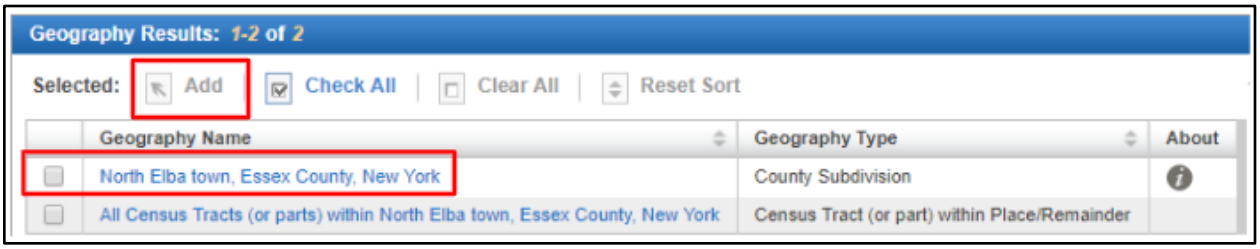
2. Select a search method. "Name" is generally easiest when searching for a geography such as a specific state, city, or town.



3. When searching by name, geographic filters can be added to narrow search results.



4. When the desired geography is located, clicking on the blue text will add the geography to "Your Selections." To add multiple geographies at once, check the box next to the geography and select "Add."



Calculating Educational Attainment

Calculating education attainment for Metrics 6 and 7 is very straightforward.

For Metric 6

1. Follow the steps above to locate the educational attainment table on the American FactFinder website.

2. Locate the portion of the table that indicates educational attainment of the population 25 years and over.

Subject	Total		Percent	
	Estimate	Margin of Error	Estimate	Margin of Error
Population 18 to 24 years	809	+/-147	(X)	(X)
Less than high school graduate	79	+/-47	9.8%	+/-5.8
High school graduate (includes equivalency)	147	+/-69	18.2%	+/-8.3
Some college or associate's degree	441	+/-141	54.5%	+/-14.2
Bachelor's degree or higher	142	+/-110	17.6%	+/-12.9
Population 25 years and over	6,603	+/-233	(X)	(X)
Less than 9th grade	186	+/-87	2.8%	+/-1.3
9th to 12th grade, no diploma	463	+/-171	7.0%	+/-2.5
High school graduate (includes equivalency)	1,817	+/-238	27.5%	+/-3.4
Some college, no degree	1,368	+/-238	20.7%	+/-3.5
Associate's degree	534	+/-154	8.1%	+/-2.3
Bachelor's degree	1,224	+/-234	18.5%	+/-3.7
Graduate or professional degree	1,011	+/-253	15.3%	+/-3.9

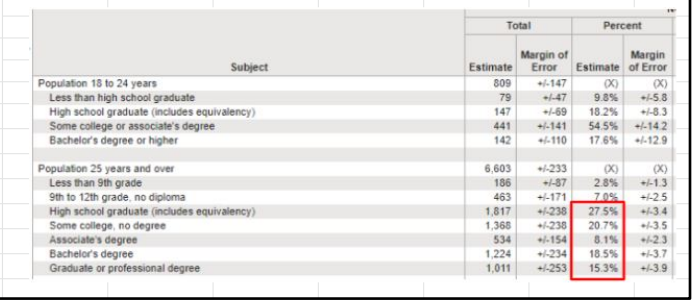
3. Add the percentages for "High school graduate (includes equivalency)," "Some college, no degree," "Associate's degree," "Bachelor's degree," and "Graduate or professional degree."

4. This calculation should be done in a spreadsheet[6] that can be uploaded onto the Arc Platform; an example of such a spreadsheet follows.

Calculating Metric 6, Percent of Population 25 Years and Over with at Least a High School Degree

1. Find the educational attainment data on the FactFinder website (image to the right is an example of what the table will look like)
2. Fill in the table below (be careful to input the correct percentages, indicated by the red box in the example table)
3. The table will sum automatically

Population 25 years and over	
High school graduate (includes equivalency)	
Some college, no degree	
Associate's degree	
Bachelor's degree	
Graduate or professional degree	
Total (number to input into Arc)	0.00%



For Metric 7

1. Follow the steps above to locate the educational attainment table on the American FactFinder website.

[6] https://bit.ly/2XPfcCi

2. Locate the portion of the table that indicates educational attainment of the population 25 years and over.

Subject	Total		Percent	
	Estimate	Margin of Error	Estimate	Margin of Error
Population 18 to 24 years	809	+/-147	(X)	(X)
Less than high school graduate	79	+/-47	9.8%	+/-5.8
High school graduate (includes equivalency)	147	+/-69	18.2%	+/-8.3
Some college or associate's degree	441	+/-141	54.5%	+/-14.2
Bachelor's degree or higher	142	+/-110	17.6%	+/-12.9
Population 25 years and over	6,603	+/-233	(X)	(X)
Less than 9th grade	186	+/-87	2.8%	+/-1.3
9th to 12th grade, no diploma	463	+/-171	7.0%	+/-2.5
High school graduate (includes equivalency)	1,817	+/-238	27.5%	+/-3.4
Some college, no degree	1,368	+/-238	20.7%	+/-3.5
Associate's degree	534	+/-154	8.1%	+/-2.3
Bachelor's degree	1,224	+/-234	18.5%	+/-3.7
Graduate or professional degree	1,011	+/-253	15.3%	+/-3.9

3. Add the percentages for “Bachelor’s degree” and “Graduate or professional degree.”

4. This calculation should be done in a spreadsheet[7] that can be uploaded onto the Arc Platform; an example of such a spreadsheet follows.

Calculating Metric 6, Percent of Population 25 Years and Over with at Least a High School Degree

1. Find the educational attainment data on the FactFinder website (image to the right is an example of what the table will look like)
2. Fill in the table below (be careful to input the correct percentages, indicated by the red box in the example table)
3. The table will sum automatically

Population 25 years and over	
Bachelor's degree	
Graduate or professional degree	
Total (number to input into Arc)	0.00%

Subject	Total		Percent	
	Estimate	Margin of Error	Estimate	Margin of Error
Population 18 to 24 years	809	+/-147	(X)	(X)
Less than high school graduate	79	+/-47	9.8%	+/-5.8
High school graduate (includes equivalency)	147	+/-69	18.2%	+/-8.3
Some college or associate's degree	441	+/-141	54.5%	+/-14.2
Bachelor's degree or higher	142	+/-110	17.6%	+/-12.9
Population 25 years and over	6,603	+/-233	(X)	(X)
Less than 9th grade	186	+/-87	2.8%	+/-1.3
9th to 12th grade, no diploma	463	+/-171	7.0%	+/-2.5
High school graduate (includes equivalency)	1,817	+/-238	27.5%	+/-3.4
Some college, no degree	1,368	+/-238	20.7%	+/-3.5
Associate's degree	534	+/-154	8.1%	+/-2.3
Bachelor's degree	1,224	+/-234	18.5%	+/-3.7
Graduate or professional degree	1,011	+/-253	15.3%	+/-3.9

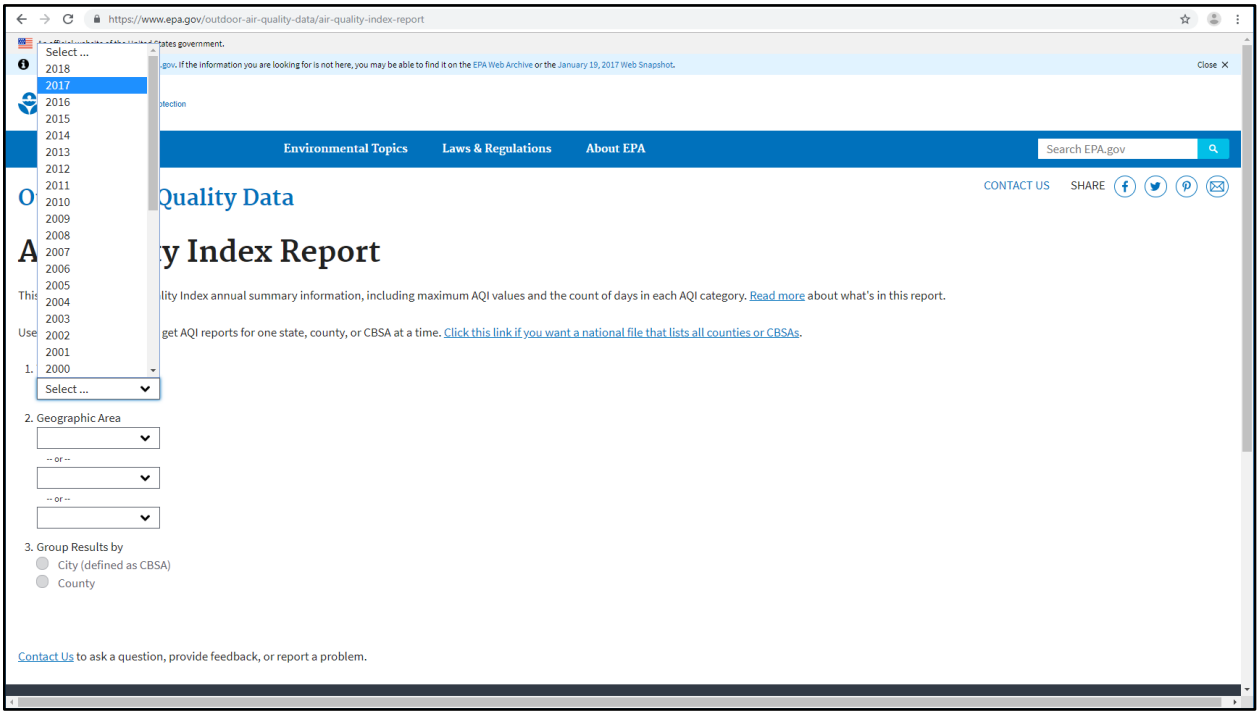
[7] https://bit.ly/2GL8eIR

Metrics #12 & 13 - Air Quality

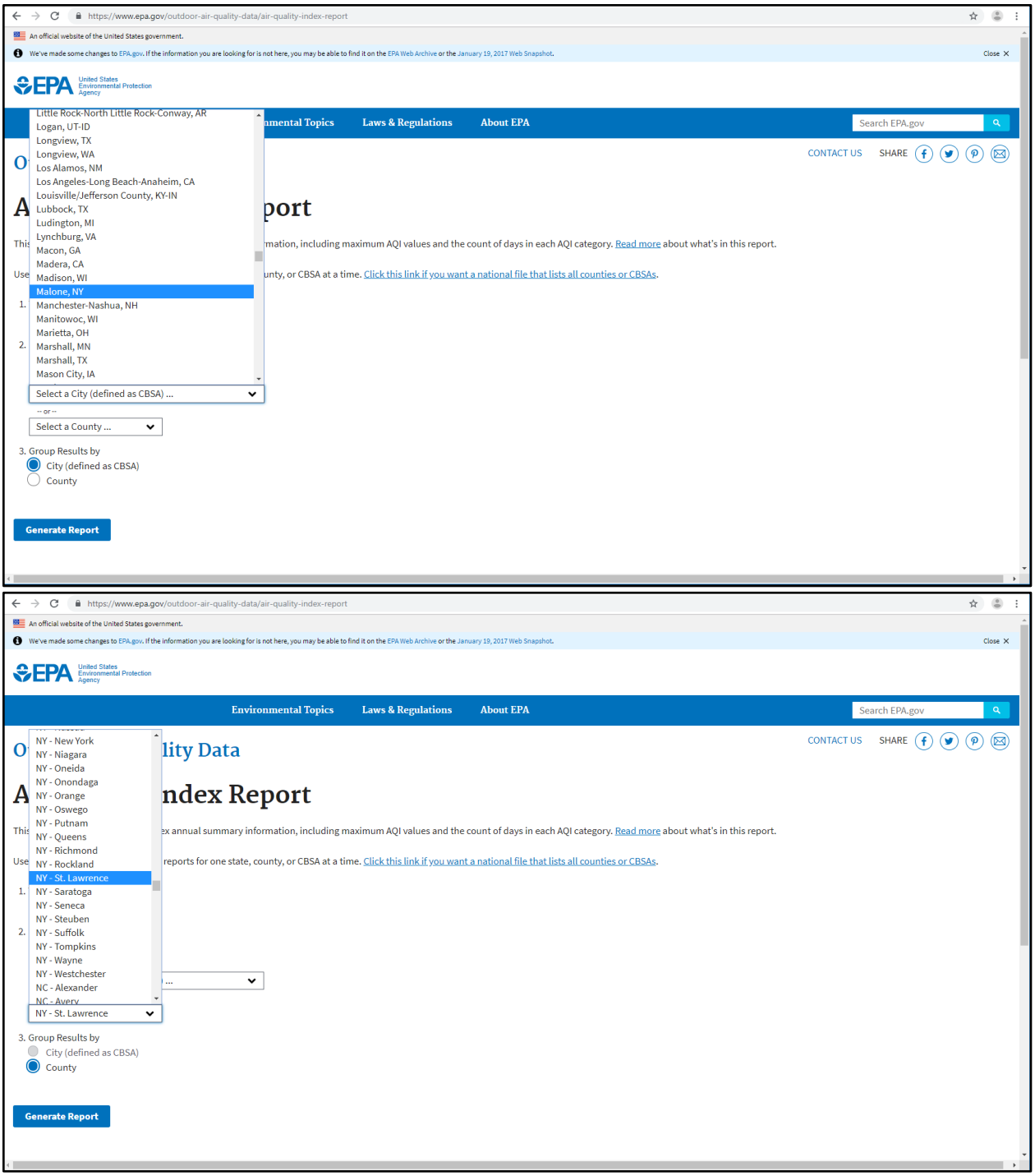
Metrics #12 and #13 address Air Quality Index (AQI), a measurement of air quality based on the concentrations of given airborne pollutants within a region's airspace. It is expressed as a unitless value between 0 and 500.

Finding Data

1. Go to the EPA's Air Quality Index Report webpage (https://www.epa.gov/outdoor-air-quality-data/air-quality-index-report) and select the year for which you would like to acquire data from the first dropdown menu. You should select the most recent complete year.

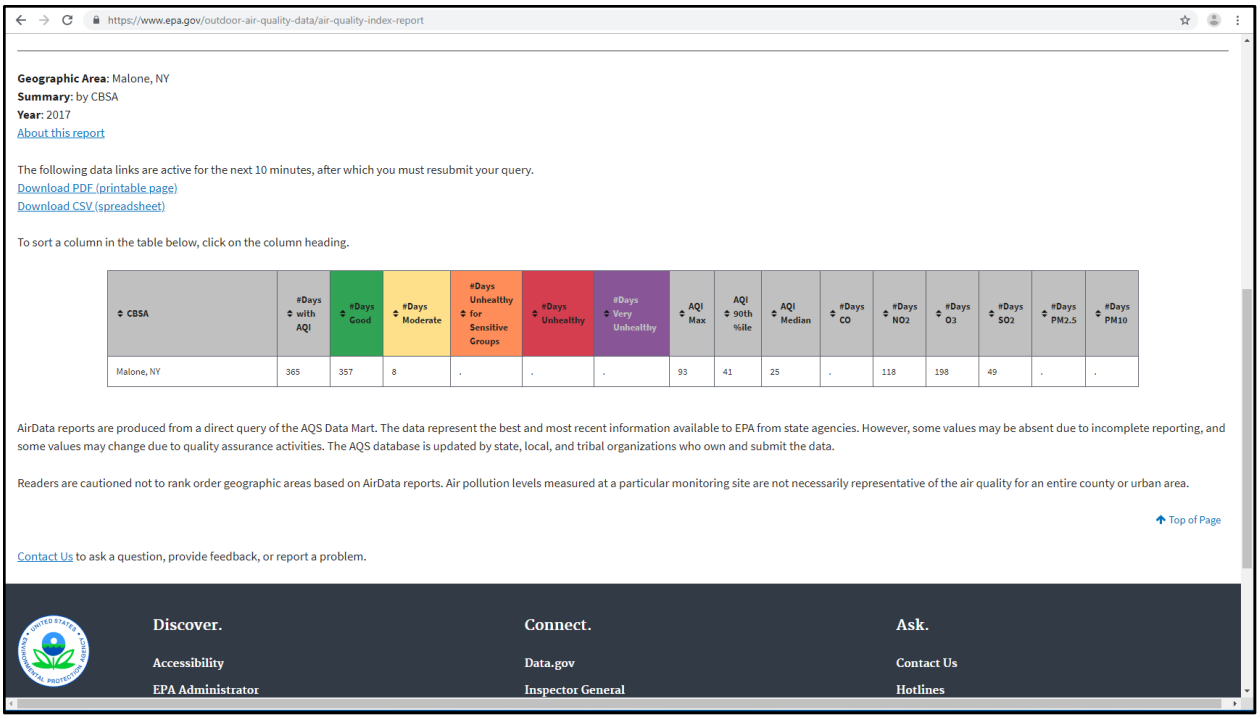


2. Select the geographic area where your community resides.
    - If your community is large enough, it may be listed under the "Select a City" dropdown menu. Check this dropdown menu first.
    - If your community is not listed under the "Select a City" dropdown menu, then select the county in which your community is located from the "Select a County" dropdown menu. County data should be an appropriate proxy for any community that does not have a more specific data source, but it is suggested that you locate the station that provides county data to the EPA, and double check that the data is representative of your community's airspace.



3. Click the “Generate Report” button.
4. A data table containing all available air quality data for your selected region will appear below. The two values you should be sure to record are the “AQI Median” and the “# Days Unhealthy for Sensitive Groups.” For LFC Certification, you will only need these two data points from the most recent complete year, but it is encouraged for you to retrieve and record all data points from as many years previous as

possible by repeating this process and compiling the results in a table. The Arc Platform will allow you to input values from as many previous years as you want, and these historical values may help your community determine trends and measure progress. Note that null and zero values are both displayed as empty cells in this table, and so some interpretation may be necessary to determine the meaning of an empty cell.



https://www.epa.gov/outdoor-air-quality-data/air-quality-index-report

Geographic Area: Malone, NY
Summary: by CBSA
Year: 2017
About this report

The following data links are active for the next 10 minutes, after which you must resubmit your query.
Download PDF (printable page)
Download CSV (spreadsheet)

To sort a column in the table below, click on the column heading.

CBSA	#Days with AQI	#Days Good	#Days Moderate	#Days Unhealthy for Sensitive Groups	#Days Unhealthy	#Days Very Unhealthy	AQI Max	AQI 90th %ile	AQI Median	#Days CO	#Days NO2	#Days O3	#Days SO2	#Days PM2.5	#Days PM10
Malone, NY	365	357	8	.	.	.	93	41	25	.	118	198	49	.	.

AirData reports are produced from a direct query of the AQS Data Mart. The data represent the best and most recent information available to EPA from state agencies. However, some values may be absent due to incomplete reporting, and some values may change due to quality assurance activities. The AQS database is updated by state, local, and tribal organizations who own and submit the data.

Readers are cautioned not to rank order geographic areas based on AirData reports. Air pollution levels measured at a particular monitoring site are not necessarily representative of the air quality for an entire county or urban area.

Top of Page

Contact Us to ask a question, provide feedback, or report a problem.

Discover. Connect. Ask.
Accessibility Data.gov Contact Us
EPA Administrator Inspector General Hotlines

5. Compile your results in a table.

6. Input the values for AQI Median and Days Unhealthy for Sensitive Groups into the Arc Platform.

Metric #14 - Violent Crime

Metric 14 measures the amount of violent crime reported in a community in offenses/capita/year. In rural communities, this crime data is likely to come from local police departments and/or the state Division of Criminal Justice Services (DCJS) or equivalent agency.

1. Data for Violent Crime is most likely to come from the community's local Police department or from their state agency responsible for crime data (DCJS).

- **Example**: For NYOR, data for Violent Crime was found from the New York State Division of Criminal Justice Services (NYS DCJS)[8].
    - An Excel report was found that gives the individual a number of index crimes (which include violent crimes) reported in Essex County and who the crimes were reported to from 2013-2017. This file included data from Lake Placid Village Police Department and State Police.

2. This data is likely to be at the county/parish level, and it may be necessary to manipulate or exclude certain data to obtain your community's Violent Crime/capita/year number.
    - **Example**: In NYOR, all the State Police data for other towns in Essex County was ignored form the original report, yielding only the crimes reported by the State Police in the North Elba area.
    - That combined with the Lake Placid Village Police Department data yielded the NYOR data entered into ARC.

3. Once you have isolated the data specific to your community, you may have to further manipulate it to be offenses/capita/year. Crime data is standardly reported as a violent crime per 100,000 people and you will have to manipulate this number to properly represent your community's population.
    - **Example**: After changing the data scale from offences/10,000 to /capita the final NYOR Violent Crime value was .0026 offenses/capita/year.

4. Once you have converted the specific data for your community to offenses/capita/year you can enter that number into Arc.

[8] https://www.criminaljustice.ny.gov/crimnet/ojsa/indexcrimes/county_totals.htm

Chapter 4: Community Metrics

The process of selecting and creating community metrics is less of a straight line and more of a spiral. You should start with broad goals and a long list of metrics, and review and adjust the list repeatedly until you end up with a list of metrics that addresses specific, high priority community goals. While it is reasonable and expected that the following steps may be taken out of order, it is highly recommended that Step 1 comes before anything else.

As you make final decisions about which metrics you will commit to tracking, keep in mind that someone will have to find and input data for each metric - this will theoretically become easier over time, but don't overwhelm your resources all at once. All Community Metrics should be tracked in a spreadsheet (a template and instructions can be found here: https://bit.ly/2EZJbkn).

1. Define community goals and priorities.
    - Review community planning documents.
        - If necessary, reach out to the community and create plans to address the concerns of community members and community leaders.
    - It is useful to create a master list of all the community goals and priorities you define.
        - If your community is multi-jurisdictional and there are goals and priorities that are specific to some stakeholders and not others, we recommend you clearly denote which stakeholders correlate with which goals and priorities.
        - Keeping track of goals can be done in a spreadsheet[9] or a word document; a spreadsheet is recommended (you can easily add a column to track which metrics correspond to which goals).

2. Consider the 14 Performance Metrics - are there gaps in what the metrics represent about your community?
    - For example, if you have a high tourist population, you may want to create community metrics that account for the tourist population in some of the 14 Performance Metrics.
    - As another example, if trade school certifications are more valuable in your community than Bachelor's degrees, you may want to track the number of trade school certifications.

3. Review the list of additional metrics provided by the USGBC.

[9] https://bit.ly/2EZJbkn

- Read through the recommendations and mark *all* the metrics that *might* be relevant to the community.
- Refine list to only include the most relevant/important metrics.
    - You can always add more community metrics in the coming years as data collection for existing metrics becomes more streamlined.
- If there are suggested metrics that are close to suiting your needs, but aren't exactly what you're looking for, feel free to edit and modify them.

4. Compare your goals and priorities list to your community metrics list.
    - Are all of your goals and priorities addressed?
        - If no, review Steps 2 and 3 and consider Step 5.
    - Do you have a manageable number of community metrics?
        - If no, see Step 3.b.i.

5. If there are still gaps in your community metrics list, you'll need to create your own metrics.
    - Starting with the list from Step 1, consider how you can measure the success and progress of community plans.
    - Take a look at how other communities, groups, and organizations are measuring similar goals.
        - For example, when NYOR was looking to measure sustainability in mountain bike trails, we followed guidelines recommended by the International Mountain Bicycling Association.

Chapter 5: Caveats and Explanations

EPA's Greenhouse Gas Equivalencies Calculator

The calculations performed by this EPA tool[10] are approximate, and are rounded to the nearest whole number. The results are *accurate*, and can be trusted and used for estimates, but are not *precise* and should not be considered to be exact.

American Community Survey

The US Census Bureau's American Community Survey started collecting data in 2005 in response to the need for continuous, accurate data about the country's population. This data is collected by monthly surveys that are used to create annual estimates that can be used by policymakers, researchers, and the general public. To learn more about the sample size and quality of the data provided by the ACS, use the tools provided on their website[11]. When using ACS data, be sure to pay attention to the margins of error provided in each table. Before comparing ACS data, check the Bureau's guidelines[12] and use the statistical testing tool[13] provided on their website.

[10] https://epa.gov/energy/greenhouse-gas-equivalencies-calculator
[11] https://www.census.gov/acs/www/methodology/sample-size-and-data-quality/
[12] https://www.census.gov/programs-surveys/acs/guidance/comparing-acs-data.html
[13] https://www.census.gov/programs-surveys/acs/guidance/statistical-testing-tool.html

Conclusion

We hope that we have provided useful guidance on the LEED for Communities certification process. Every community comes with its own set of circumstances and challenges, and no single process is universally applicable. You and your team will need to be creative with your solutions to the problems that arise during your certification experience. We recommend that you regard this process as an exercise in problem-solving, and hope that this mindset will allow you and your team to appreciate the unique characteristics of your community. Remember that LFC certification is just a step on the journey to sustainability, and not the destination. Happy trails!