



# The Georgetown University Energy Prize

## Competition Guidelines

Version 8.3, 1 May 2017

### Introduction

Energy efficiency is the single most important source of energy available to the world's economies for years to come. To help tap that resource, Georgetown University's [Program for Science in the Public Interest](#), [Global Social Enterprise Initiative](#), and [Environment Initiative](#) are launching the Georgetown University Energy Prize (GUEP) for small to medium size residential communities. The competition will challenge communities to achieve innovative, replicable, scalable and continual reductions in the energy- consumed by residential and municipal customers from local natural gas and electric utilities. For a brief overview, see the [Competition Summary](#) in these Guidelines and also the GUEP website <http://www.guep.org>.

The GUEP will:

- Challenge a large number of communities to work together with their local governments and utilities to create and begin implementing long-term plans for the continual improvement of energy efficiency;
- Stimulate replicable innovations in community energy efficiency;
- Educate the public about the total energy and environmental costs of the full fuel cycle;
- Educate the public and engage students in energy efficiency issues, methods, and benefits, and encourage lasting behavior change;
- Help to grow markets for products and services that facilitate energy efficiency and renewable, clean energy production;
- Reward the community as a whole, and not specific individuals.

This document provides a description of the prize design and requirements for competitors.

### What's New in Version 8.3?

Version 8.3 provides minor updates to the timeline and process for finalist selection. These have been previously communicated to all communities by email and this update is for consistency. Minor grammatical updates have also been made.

### Competition Summary

The Georgetown University Energy Prize (GUEP) challenges U.S. communities to work together with their local governments and utilities in order to develop and begin implementing plans for innovative, replicable, scalable and continual reductions in the energy-per-residential-account consumed from local natural gas and electric utilities. Communities are encouraged (but not required) to strengthen their plan via partnerships with businesses, foundations, local colleges and universities, as well as by exploiting other resources (see "Energy Efficiency Resources for Communities").

For this competition, a “community” is defined geographically by the limits of a municipality – a town, city, or county that has corporate status and local government. All small to medium municipalities in the U.S.A. with populations between 5,000 and 250,000 were eligible to apply.<sup>1</sup>

The competition comprises four stages over a three year period that started April, 2014. It challenges communities to develop a long-term energy efficiency plan and to demonstrate initial effectiveness. The winning community will receive a prize to support energy-efficiency programs that reward the community as a whole, for example to ensure the continuing implementation of long term plan.

Here is an overview of the GUEP competition stages (for details and discussions of issues, see subsequent Sections, including [FAQs](#)):



**Pre-Launch – Letter of Intent (July, 2013 – April, 2014)** Fifty-two communities submitted a Letter of Intent (LOI) during this stage of the competition, which is now closed.

**Stage 1 - Applications (April – July, 2014):** Using a template provided by the GUEP, communities submitted basic applications. After a review by the Energy Prize team, credible applications that included commitments from local government, utilities, and community organizations in eligible communities have been selected as Quarterfinalists and invited to compete in Stage 2 by submitting detailed Program Plans.

**Stage 2 - Quarterfinalist Energy Efficiency Program Plans (August – November, 2014):** On 10 November, 2014, Quarterfinalists submitted a detailed Program Plan for their community’s energy-saving program. Basic Plan requirements included: Plans should be long-term Plans, with commitments by residential associations, governments, institutions, or businesses in the community to policies and projects that will yield continual improvement. Energy-saving Plans could be a part of a larger pre-existing plan that the community has begun, or they could be new plans that will be implemented specifically to meet the GUEP challenge. In addition, Quarterfinalist communities had opportunities to apply for seed grants from GUEP partners and other organizations to help them implement their Plan.

Based on the submitted Program Plans and seed-funding proposals, the Energy Prize team has invited 50 communities to compete as Semifinalists in Stage 3.

**Stage 3 - Semifinalist Performance Competition (January, 2015 – December, 2016):** The Semifinalists will compete for 2 years to reduce their utility-supplied energy consumption in a manner that is likely to yield continuing improvements within their own community and replication

<sup>1</sup> These limits of community size include approximately 65% of the U.S. population.

in other communities. Consumption over the 2 year period will be compared with baseline consumption over the 2 years preceding the start of the Semifinals (i.e. 2013-2014).

For purposes of this prize, community energy consumption measurements are restricted to energy supplied by gas and electric utilities directly to all residential and municipal customers. It is not a requirement that communities have both gas and electric utility services.

***Stage 4 - Finalist Selection, Judging and Awards (January – September, 2017):*** Up to 10 Finalists will be selected based primarily on energy-saving performance during Stage 3.<sup>2</sup> These Finalists will be invited to submit Final Reports covering relevant aspects of the community's plan, performance, and future prospects. The Judging Panel will score the final reports in specific, weighted categories and select the winners based on a combination of these scores and the Stage 3 energy-saving performance.

The highest-ranking community will be awarded first place, with the requirement that the prize benefit the community at large in accordance with spending proposed in the community's Stage 2 Program Plan. Second and third place may also be awarded; these additional winners will receive special recognition and additional benefits.

## Eligible Communities

For purposes of the GUEP, a "community" is normally defined geographically by the limits of a single municipality – a town, city or county that has corporate status and local government. All municipalities in the U.S.A. with populations between 5,000 and 250,000 were eligible to apply. Eligibility was based on the 2010 Census.

We also considered applications from "combined communities": multiple, contiguous municipalities that together have a total population between 5,000 and 250,000. The geographic border of such a combined community must surround a single, contiguous region that contains the entirety of every participating municipality, and no portion of a non-participating municipality. Such combined communities had to provide additional information in their application as follows:

- Evidence that the communities can work together successfully (ideally by citing previous cooperation);
- An explanation of how the local governments, utilities, and relevant community organizations will work together on GUEP.
- A description of how the purse would be shared or jointly-used, if won.

In the case of communities with overlapping jurisdictions (e.g., both a town and its county apply), only one community could apply and compete. If however, every municipality within a county commits to participating, then the county and its municipalities could be considered as a "combined community", discussed above.

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<sup>2</sup>The Judging Panel will select the appropriate number of Finalist communities based on the performance data and the final judging criteria outlined in this document.

## Energy Consumption Reporting During Competition Stage 3 (Semifinal)

### Data from Local Utilities

In order to compete for the GUEP, a community must obtain the cooperation of all natural gas and electric utilities that serve the community (note a community need not have both gas and electric services). The utilities must have or commit to develop the capability of reporting quarterly to GUEP the total (aggregate) monthly energy directly supplied by natural gas and electric utilities to all of their residential and municipal customers in the community, as well as the monthly number of residential bills issued, i.e.:

$ER_E$  = total residential kWh of electrical energy billed in a given month (regardless of the number of different billing dates with the month).

$EM_E$  = total municipal kWh of electrical energy billed in a given month (regardless of the number of different billing dates with the month)

$N_E$  = number of residential electric bills issued during that month

$ER_G$  = total residential Therms of gas energy billed in a given month (regardless of the number of different billing dates with the month)

$EM_G$  = total municipal Therms of gas energy billed in a given month (regardless of the number of different billing dates with the month)

$N_G$  = number of residential gas bills issued during that month

Utilities will report electrical energy in kWh and gas energy in Therms, which GUEP will convert to kBtus using the conversion factors 3.412 and 100 respectively.<sup>3</sup>

Note that aggregate energy consumption data will be reported separately for the residential and municipal sectors. (For a discussion of the limitation to residential and municipal sectors, see the FAQ "[Why restrict the energy consumption to residential and municipal?](#)"). Quarterly reports are due within 45 days of the quarter's end (see timeline on p. 18).

Communities must work with utilities to ensure accurate, timely, data reporting to GUEP.

For purposes of the GUEP, a given month's aggregate energy use is defined as the total energy billed during that month. That is, if a bill is issued anytime between the first and last days of the month, the billed energy is counted in that month's aggregate energy use. Aggregate energy use (vs. use in individual buildings or residences) is used for simplicity and to avoid privacy concerns. Note that energy billed during a given month is not the same as energy actually consumed during a given month, because energy billed is affected by such things as billing periods, estimated readings, missed readings, erroneous readings, etc. It is, however, easy for utilities to determine, and it's a sufficiently good estimate of energy consumed to serve the purposes of the Performance Dashboard. Moreover, final scoring will be based on the

<sup>3</sup> <https://portfoliomanager.energystar.gov/pdf/reference/Thermal%20Conversions.pdf>

aggregate billed energy for the full 24 months of the competition period, which will be very close to the aggregate energy used.

The first quarterly report must include the community's baseline energy use; i.e., the energy data (listed above) for the 24 months prior to the start (i.e., for 2013-2014). For a discussion of the required data format, see "[Format of Data Provided by Utilities](#)".

To enable energy-cost estimation in the Performance Dashboard, we will use the average cost per electrical and per gas energy unit over the 12 months preceding the start of Stage 3 Performance Competition. Accordingly, the first quarterly report must also include the average gas and electricity costs (per energy unit) during 2014 (i.e., averaged over the entire year). It is up to the community to obtain these two average costs – e.g. from the utilities, from public data, or from some combination. Since the cost data will be used in the Performance Dashboard for educational purposes only, and will not be used in any way for performance scoring, the cost information not have to be exact. Similarly, this baseline cost information will be used throughout the competition – i.e., it won't be adjusted to reflect possible rate changes. Communities are encouraged to let the GUEP know if any data reporting problems arise during the competition; so that we can do our best to resolve them.

We recognize that data collection is non-trivial, and that communities may have special circumstances that make it difficult in ways that we may not have anticipated. We want to work with you to address these circumstances. If you have not already done so, please ask your utilities to fill out the Data Collection Methodologies Form (downloadable at [www.guep.org/rules-timeline](http://www.guep.org/rules-timeline)), and then send it to us along with a discussion of any difficult issues that arise.

Apart from the general incentive of good community relations, some utilities will have additional motivations to support GUEP communities. This is clearly the case for publically owned utilities, but it's also true for many investor-owned utilities. For example, if a utility has a regulatory-approved Energy Efficiency Program, cooperation with the community's GUEP effort should lead to increased customer participation in the utility's Program. Another point is that most utilities have a desire to get their customers to engage with them online, something that's likely to occur naturally in the case of GUEP competitors.

### **Residential Accounts**

Since utilities generally have a specific billing rate for residential accounts, most residential customers can be identified by selecting bills that satisfy two criteria:

(a) The service address is in the municipality. Ways in which this can be determined include:

- Selecting for the municipality name in the address to which the bill is sent (or the address where the meter is installed).
- Selecting via a list of zip codes.
- Selecting via a list of tax districts.

Note that units of counting like zip codes or tax districts at the boundary of the municipality may extend beyond the municipality. It is acceptable to exclude or include such counting units provided that the population excluded or the additional population covered does not exceed 5% of the total population of counting units that are entirely within the municipality.

In general, for any proposed method of determining service addresses, communities must show that it is accurate to within 5%

(b) The bill is computed using residential rates or multifamily residential rates

Note that this selection will include both renters and owners. Compared to owners, renters typically have limited abilities to install retrofits, install energy-saving appliances, and take other measures. But renters are part of the community, and there are energy-saving measures that they can take.

Apartment buildings that are charged residential or multifamily rates will be included in the above selection.

In apartment and condominium (or co-op) buildings where residents are billed individually, there will usually be one or more additional accounts that are billed for energy consumed in the building infrastructure (common areas, parking, etc.). Ideally, these accounts should also be included by enumeration (unless they are charged residential rates, in which case they will be included in the selection described above, but if including them is difficult it is permissible to exclude them, subject to the overall aggregate energy error rate discussed below,

Regarding apartment buildings, complexes, or resort communities that do not have residential sub-meters billed at residential rates, in some cases a utility can identify the accounts via a special rate class. In other cases, the accounts are charged a standard commercial rate and can't be distinguished from non-residential accounts. Given the importance of widespread community engagement (see "[Final Report](#)" and "[Final Judging](#)"), such accounts can be identified by enumeration, so a list can be provided to the utility for inclusion in the residential energy aggregate. We prefer that communities take this approach, but we recognize that doing so may be onerous or impossible. Accordingly, it is permissible to exclude apartment buildings that are charged commercial rates, again subject to the overall aggregate energy error rate discussed below. .

Hotels, including long-term stay hotels, may be excluded.

Although we encourage the involvement of local colleges and universities, on-campus housing is excluded (primarily because billing practices generally make it difficult to report their energy use). Students and faculty who live off-campus are included (and would not be distinguished from other residents).

Military bases (including on-base military housing) are excluded. Military personnel who live off-base are included (and would not be distinguished from other residents).

In addition to the cases discussed above, other special circumstances may make it impossible or extremely difficult to identify \ accounts that provide energy to residential users. In general, communities must be able to show that accounts excluded or included do not amount to more than 5% of the total aggregate residential energy that is reported to GUEP.

Note that, should the community advance to the Finals, the data collection procedures will be subject to an audit.

## **Municipal Accounts**

### Municipal Accounts - Definition

For purposes of the GUEP, municipal energy use is defined as the aggregate energy billed to accounts that purchase gas or electric energy satisfying *any* of these criteria:

- The account is paid for by the municipality or by a government entity that is governed by or reports to the municipality.
- The energy is consumed by municipal employees in the course of their work as well as by the facilities in which they work.
- The energy is consumed in delivering municipal services to the community.
- The energy is consumed by contractors working for the municipality and by their relevant facilities, provided that the municipality has an ability to influence consumption directly or indirectly.

Note that relevant accounts must be included whether or not the municipality actually pays a bill for that account. For example, some municipalities have franchise agreements with utilities that only require the municipality to pay bills for revenue-generating buildings (e.g., parking garages).

Examples of municipal energy use include:

- All offices and buildings used by the municipality, whether owned, leased, or rented by the municipality, regardless of whether the facilities are located within the municipal boundaries. – examples include, municipal offices, police stations, fire stations, public schools, libraries, parking garages, water treatment and delivery facilities, chilled water facilities, airports, etc.;
- Vacant offices and buildings that are owned, owned, leased, or rented by the municipality.
- Infrastructure such as street lighting, traffic lighting, etc.;
- Parking garages;
- Parks and recreation;
- All (K-12) public, charter, and private schools located within the municipal boundaries and attended by community residents should be included, whether or not the municipality owns the buildings, pays the utility bills, or has education-related jurisdiction over the schools; If the utilities require permission from a school district (or from schools themselves) to include their energy use in the municipal aggregate, it is up to the municipality to secure permission. In special circumstances (e.g., privately-operated schools that refuse to cooperate), a school may be excluded, but in each case permission must be obtained from GUEP. Overall, excluded schools cannot together serve more than 20% of the school-aged children in the community.
- Public housing that is not charged a residential rate;

Municipal energy use does not include energy used by:

- State, and Federal buildings that happen to be in the municipality; likewise County buildings unless the GUEP entry is the County
- Military bases;
- Colleges and universities;
- Preschools (i.e., before kindergarten) that are not located within a K-12 school.
- K-12 schools of any type that are within municipal boundaries but are not attended by community residents
- Buildings owned by the municipality but leased to others (and not used by the municipality or in ways that deliver municipal services);
- Utilities owned by the municipality.
- Accounts paid by a municipal transit authority;
- Accounts that pay for energy used in transportation.
- Public housing that is charged a residential rate (these accounts are to be included in the residential energy aggregate);

For some municipal accounts, it may be that only a portion of the energy is used as specified above. Ideally, if the relevant utilities can implement it, the community should propose an equitable method of apportioning the energy use. We recognize, however, that utilities may be unable or unwilling to include only a portion of an account in the energy aggregations. In such cases, it is permissible to exclude the account if the community can show that this portion is less than 20% of the energy billed to the account. However, we prefer that such accounts be included, especially in cases where the other tenants are likely to be cooperative – e.g., when a facility is used by both city and county staff (and it’s the city that is competing). Other examples include facilities for water delivery and wastewater treatment.

For some municipal or residential buildings, cooling or heating is achieved in part or whole via a chilled water or steam loop serving multiple buildings, thereby reducing the building’s requirement for energy consumed directly from utilities. However, if the chilled water or steam is produced by a municipally-owned facility, then the energy consumption of that facility will be included in the municipality’s total energy consumption (assuming the facility consumes gas or electric energy). Regardless, this is not likely to be a significant issue since judging is based on the percentage change in energy consumption. If in fact it’s a significant issue, the community must bring it to the attention of GUEP.

If any bills are based on negotiated pricing rather than measured use, these should be identified and explained, and the community should propose how to handle this in the competition. For example, street lighting is sometimes handled this way, with municipality being charged per streetlight per year.

If it is ambiguous or uncertain whether an account should be included in the municipal energy use aggregation, the accounts must be included unless the exclusion is agreed to by GUEP.

#### Municipal Accounts - Identification

Since municipal accounts typically do not have a unique, special rate (e.g., distinct from residential, commercial, or industrial rates), it’s unlikely that a rate-based approach can be used to identify the municipal accounts. However, since there will be a relatively small number of



relevant accounts, the municipal accounts can be identified by enumeration. It is the responsibility of the municipality to provide the local utilities with a list of all such accounts or, with assistance from the utilities, to select another method for accurately identifying the accounts.

As is the case with residential accounts, the list or method will be subject to audit if the community advances to the Finals.

If existing but previously-overlooked municipal accounts are discovered during the Stage 3 Performance Competition, they should be included in the energy aggregation for the remainder of the competition.

If new municipal accounts are established during the Stage 3 Performance Competition, they should be included in the aggregation thenceforth, and reported to GUEP via an amended list of municipal accounts, together with an updated report on the aggregate energy used during the baseline period and used since the start of the competition.

### **Format of Data Provided by Utilities**

To deliver data for the 24 months of baseline energy use and for the quarterly reports of monthly energy use during the 24 months of Stage 3 (Semifinalist Performance Competition), utilities must upload a standard GUEP CSV template. Two approaches are available. Large utilities that serve multiple communities may prefer to upload a single CSV file that reports both gas and electric energy usage for all competing communities in their jurisdiction. Smaller utilities may prefer to upload a CSV file that reports one type of energy usage (gas or electric) for a single community. Both types of templates are available at <https://guep.org/about-the-prize/>, and data will be uploaded at <https://guep.org/energydata>. Communities should contact the GUEP staff quickly if their utilities have any issues with the available templates.

For simplicity, accuracy, and accountability, GUEP's strong preference is that the CSV files be uploaded directly by utilities. However, we understand that unavoidable technical, legal, or policy limitations may prevent direct uploading, requiring that the CSV files prepared by utilities be transmitted to the community leaders for uploading into the GUEP system. In such cases, with the prior approval of GUEP, communities will be able to create accounts at <https://guep.org/energydata/> and upload the CSV files that they receive from their utilities.

Regardless of whether the community or the utility uploads the data, **the utility must retain original copies of the data generated for the competition until December 31, 2017**. This original data must be available to the GUEP team upon request. The GUEP team does recognize that additional paperwork may be required for a utility to release the data directly to GUEP, if requested.

In addition, both the community and the utility should – to the extent possible – retain any supplementary data, records, or internal communications related to data collection and submission for future verification and auditing, if required by GUEP at any point in the competition, especially during the Finalist round.

### **Data Exceptions**

GUEP recognizes that reported monthly energy use may have inaccuracies or errors – examples include estimated (vs. actual) meter readings, inadvertently excluded readings, inadvertent multiple readings, etc. In most cases, such inaccuracies will be self-correcting when

reports for later months are submitted, and therefore will not affect final scoring since that is averaged over 2-year periods (see “[Selection of Finalists](#)”). However, if there is any reason to suspect or believe that accumulated errors or other reporting difficulties may result in more than a 5% error in the total reported energy use for either the 2-year baseline or 2-year competition periods, that must be reported to GUEP in detail. Otherwise, utilities will simply need to affirm in writing that there’s no reason to suspect such errors in reporting.

### **Community Generation of Electricity**

In some communities, the electric power drawn from utilities by certain residential or municipal accounts is reduced by locally-generated power (e.g., rooftop solar, wind turbines, etc.). Such reductions will automatically be reflected in the aggregate energy billing reports produced by utilities, and will therefore improve the communities’ energy-use score.

In the event that such local-generation produces excess power – i.e., more power than consumed by the relevant account – some utilities provide a mechanism (often called “net metering”) through which the utility purchases the excess power and provides a financial credit to the relevant account. Unfortunately, it’s not straightforward (or, in some cases, not possible) for utilities to convert the financial credit to an energy credit. Moreover, not all utilities support net metering (i.e., excess energy is not fed back to the grid). So in fairness to all communities, GUEP does not attempt to provide credit for locally-generated power that exceeds the relevant account’s needs, especially since typically most of the benefit from such local-generation is in reducing the power drawn from the utility.

In some cases, a community or municipality may operate facilities (e.g. solar or wind turbine farms) that sell energy directly to a utility rather than reduce the energy consumed from the utility. Such facilities are valuable and important because they can reduce the community’s overall environmental footprint (e.g. helping a community to reach a net-zero goal), but do not improve the efficiency of energy use and are not included in GUEP energy-use scoring. They do not actually reduce the amount of energy consumed from the utility, which is the focus of GUEP.

### **Basic Figure of Merit (Adjusted Source Energy Use per Residential Bill)**

The basic GUEP figure of merit for scoring community energy use is the Adjusted Source Energy Use per Residential Bill. The (non-adjusted) Source Energy Use per Residential Bill is defined as

$$SEU = S_E * (EU_E / N_E) + S_G * (EU_G / N_G)$$

where

$EU_E$  = total residential and municipal BTUs of electrical energy billed in a given month (regardless of the number of different billing dates with the month); in technical terms, this is “site energy”;

=  $ER_E + EM_E$  (these values are delivered to GUEP by community utilities. (see [Data from Local Utilities](#))

$N_E$  = number of residential electric bills issued during that month; this value is delivered to GUEP by community utilities.

$EU_G$  = total residential and municipal BTUs of gas energy billed in a given month (regardless of the number of different billing dates with the month); again, this is “site energy”;

=  $ER_G + EM_G$  (these values are delivered to GUEP by community utilities. (see [Data from Local Utilities](#))

$N_G$  = number of residential gas bills issued during that month; this value is delivered to GUEP by community utilities.

$S_E$  = source energy factor for electricity (national average – see below)

$S_G$  = source energy factor for gas (national average – see below)

As mentioned earlier (see “[Data from Local Utilities](#)”), energy billed during a given month is not the same as energy actually consumed during a given month. We use energy billed because that’s what utilities can easily determine, and because the aggregate energy billed over the full 24 months of the competition period will be very close to the aggregate energy used.

To provide fair comparisons between communities, the figure of merit is normalized to adjust for population size. Ideally, this would be done by using energy use per capita, but that’s not possible because census figures are several years old and also because there’s no accurate way to measure changes in population size during the 24 month competition period. So GUEP uses the number of residential utility bills issued as a proxy for the population of the community, analogous to the number of households in the community – although not exact, it’s easy to measure and will rise and fall with changes in population of the community. Note that we also normalize the municipal energy use by the number of **residential** bills. This is because the municipality exists to serve the community residents, and the number of municipal accounts may not reflect changes in residential population size. For more information, see the FAQ “[Why normalize the total residential and municipal energy use by the number of residential bills?](#)”

Source energy differs from site energy in that source energy includes contributions from energy production, transportation, and delivery – all important factors in the whole picture of how energy consumption affects personal, community, and national resources. We are using the ASEU because that’s what is recommended by energy experts and the U.S. Government, and because an important goal of the GUEP is to educate energy consumers nationwide about the full consequences of energy consumption.

For a more-detailed explanation of the difference between source energy and site energy, including the rationale for why the U.S. government recommends using source energy with national average source energy factors, [see the EPA’s website here](#)<sup>4</sup>. For additional discussion of GUEP’s use of national (vs. regional) source energy factors, see the FAQ “[Why use fixed national rather than varying regional source energy factors?](#)” For the constant, national average source energy factors values that GUEP will use throughout the competition, see [here](#)<sup>5</sup>.

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<sup>4</sup> <http://www.energystar.gov/buildings/facility-owners-and-managers/existing-buildings/use-portfolio-manager/understand-metrics/difference>

<sup>5</sup> <https://portfoliomanager.energystar.gov/pdf/reference/Source%20Energy.pdf>

The (non-adjusted) Source Energy Use per Residential Bill is then adjusted to account for weather differences (heating/cooling demands), yielding the Adjusted Source Energy Use per Residential Bill (ASEU).

Both the source energy calculation and the weather normalization will be performed using EPA's [Portfolio Manager](#)<sup>6</sup>. Weather normalization will be based on both heating and cooling degree days, and will be calculated by inputting the monthly values of  $EU_E$  and  $EU_G$ . Although Portfolio Manager is intended primarily to benchmark the performance of a commercial building or a portfolio of buildings, its normalization features apply generally to any input set of utility bills.

We recognize that electricity and gas do not account for all residential and municipal energy usage, the primary omissions being oil and propane used for heating. Unfortunately, measurable energy use is essential to the prize design, and there's no straightforward way to measure the use of these other energy sources with adequate accuracy.

For some of the reasoning behind this basic figure of merit, see the FAQ "[Why normalize the total residential and municipal energy use by the number of residential accounts?](#)"

## Energy Consumption Reporting – The Performance Dashboard

During the Semifinalist Performance Competition (Stage 3), the GUEP website will maintain an energy-consumption performance “dashboard” that tracks the following:

- The Adjusted Source Energy Use per Residential Bill (ASEU)
- The carbon (greenhouse gas) emissions resulting from the full fuel cycle (i.e., like source energy, including contributions from energy production, transportation, and delivery).
- The (weather-adjusted) site-energy use per residential bill, i.e.,

$$EU = (EU_E / N_E) + (EU_G / N_G)$$

with weather adjustments performed by EPA's Portfolio Manager. As mentioned, site energy is the actual energy consumed by the community.

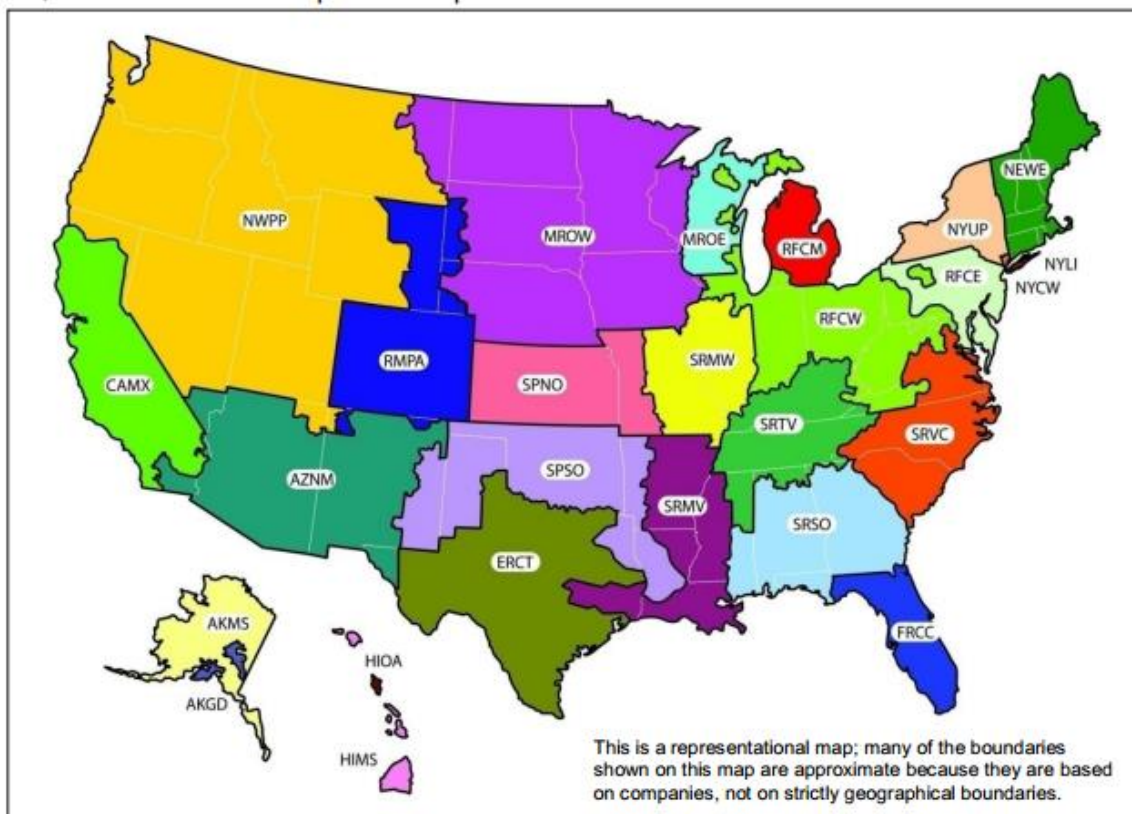
- The financial cost of the energy as paid by consumers. This will be estimated from the average cost of energy that utilities report for the 12 months prior to the start of Stage 3 (see "[Data from Local Utilities](#)").

The performance dashboard will be based on the monthly energy-consumption data provided quarterly by utilities (see below). The dashboard will include separate displays for electrical energy, gas energy, and total (gas + electric) energy. Graphical and dynamic, it will allow viewers to track the performance of single communities and compare the performance of multiple communities. It will also show the current performance relative to the performance during the baseline (24 months prior to the Stage 3 competition). Note that while the dashboard will compare the current competition performance to the baseline, and estimate the rankings of communities, because the Overall Energy Score (OES) is based on 24 month averages for both the baseline and the competition period (see below), the figures and rankings in the dashboard won't show the complete competition picture until the end of the competition.

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<sup>6</sup> <http://www.energystar.gov/buildings/facility-owners-and-managers/existing-buildings/use-portfolio-manager>

As mentioned, the full fuel cycle greenhouse gas emissions include contributions from energy production, transportation, and delivery. For natural gas, it's appropriate to use national averages. For electricity, fair comparisons are highly-dependent on location; GUEP will use estimates based on the [eGRID](#)<sup>7</sup> location of communities:



To estimate the full fuel cycle emissions, we will use the emissions data such as provided [here](#)<sup>8</sup>

### Electric and Natural Gas Vehicles

Since the GUEP is based on the residential and municipal use of energy delivered by electric and natural gas utilities, and does not attempt to include transportation uses of energy, widespread adoption of Electric Vehicles (EVs) and Compressed Natural Gas (CNG) vehicles could result in a significant increase in energy consumed from local utilities, and therefore could unfairly penalize the community. In most cases, we believe that the effect would be small, so we do not include a general mechanism to account for adoption of EVs and CNG vehicles.

However, if a community that has competed in Stage 3 believes that the effect would be significant, they may offer supporting evidence and propose a method for taking the effect into

<sup>7</sup> <http://www.epa.gov/cleanenergy/energy-resources/egrid/index.html>

<sup>8</sup> [http://www.epa.gov/cleanenergy/documents/egridzips/eGRID2012V1\\_0\\_year09\\_GHGOutputrates.pdf](http://www.epa.gov/cleanenergy/documents/egridzips/eGRID2012V1_0_year09_GHGOutputrates.pdf)

account when selecting Finalists.<sup>9</sup> It will be up to the Judging Panel to accept or reject the proposed method (which, if accepted, would be subject to audit). Should the community be selected as a Finalist, the Final Report, electric and natural gas vehicles should be discussed in detail (including the information submitted prior to Finalist selection).

## Natural Disasters

Energy use data may be skewed by natural disasters, e.g., earthquakes, extreme weather, failures of local energy production or distribution facilities, etc., GUEP will deal with these on a case by case basis, allowing petitions from affected communities. Petitions should include a description of the disaster, information about any official U.S. or State disaster declarations, and a justified estimate of the effect on energy usage.

Possible remedies include extrapolation from past data, possible removable of a 1-3 month segment of the prize timeframe, etc.

## Competition

### Timeline



For details on dates, please see "[Competition Summary](#)".

### Pre-Launch

The Letter-of-Intent (LOI) stage is now closed. Fifty communities submitted LOIs and supporting information. Participation in the LOI program is not a prerequisite for competing in the GUEP.

### Stage 1 – Applications

Eligible communities (including LOI communities) submitted a standard-form application available [here](#)<sup>10</sup>, covering the following:

- Brief description of the community and brief biographies of key community and municipal leaders. (LOI communities need not include the community description, since that was submitted with the LOI.)

<sup>9</sup> For EVs, since the installation of (240V) Level 2 charging stations requires utility involvement, the utility may have relevant information.

<sup>10</sup> <http://guep.org/apply>

- Brief description, history, and current status of existing community energy-savings programs, if any.
- Description of the process that will be used to develop the energy-savings Program Plan if the Application is accepted. (As part of the planning process, some communities may find it useful to consult the ACEEE [Local Energy Efficiency Self-Scoring Tool](#)<sup>11</sup>.)
- Letters of commitment from municipal leaders, utility officials, and (optionally) other community organizations that will support the effort.
- Combined Communities must also submit the following: (1) Evidence that the communities can work together successfully (ideally by citing previous cooperation); (2) An explanation of how the local governments, utilities, and relevant community organizations will work together on GUEP; and (3) A description of how the purse would be shared or jointly-used, if won.

After a review by the GUEP Team, fifty two credible applications from eligible communities were selected as Quarterfinalists and invited to compete in Stage 2 by submitting detailed plans.

## Stage 2 – Quarterfinals (Energy Efficiency Program Plans)

### Program Plan

Quarterfinalists prepared and submitted a Program Plan based on the outline provided below. This outline is based in part on the Final Report that communities will submit should they become Finalists, and it was intended to help you prepare an effective and competitive Plan. That said, this outline was not prescriptive. Incentive prizes work in part because they encourage innovation and do not pre-judge how the challenge is best met.

Therefore, while Plans were to include all 8 Sections, they were not required to address all of the points or issues mentioned in the outline. Some of these may not be relevant in your community, or to your community's innovative approach. Furthermore, we encouraged you to include additional Sections addressing topics that apply to your innovations.

Plans were submitted in PDF format via the website (<http://www.quep.org/plan-submission> ). Each plan was to include a title page, immediately followed by a table of contents with page numbers (ideally, with hyperlinks). Each page was to contain the name of the community in the header or footer and a page number consistent with the table of contents. There was no minimum or maximum length for the Plan. We encouraged brevity wherever possible, but not at the expense of providing important relevant information.

#### 1. **Program Management and Partners** – topics for this Section include:

- Description of Program leadership and management;
- How it will be staffed and funded;
- How the community at large will be engaged and motivated;
- How the local government will be involved, and what commitments they will make;
- Any municipal incentives that are planned via local regulations, zoning, taxation, etc.;

<sup>11</sup> <http://www.aceee.org/research-report/e13/>

- Involvement of businesses or business-groups (even though their energy use isn't counted);
- Any benefits and incentives available from local utilities via official Energy Efficiency Programs (which are mandated in many states);
- Involvement by citizen groups and major landlords;
- Involvement of other partnering organizations (including letters of commitment, if available);

2. **Energy Savings Plan – topics for this section include:**

- An overall summary of the planned program, including relevant methods and technologies.
- How the program will reach diverse aspects of the community - geographic, demographic, economic, functional, etc.;
- How energy retrofits and other capital improvements will be included in the Program. (Diverse retrofit technologies are widely available, but adoption rates historically have been low.) This portion of the Plan should include:
  - Types of retrofits that will be encouraged;
  - Retrofit financing (preferably with no cash from current property owners);
  - Retrofit business resources;
  - Retrofit marketing and sales strategies;
  - Adoption goals.
- How the Program will target high-return opportunities (if available), for example:
  - Affordable housing; (It has been reported that public housing typically uses almost 40% more energy per square foot than privately-owned housing.<sup>12</sup>)
  - Residential rentals; (Short-term renters have little incentive to invest in retrofits.)
  - Buildings in historic neighborhoods (neighborhoods that have been formally designated as “historic” by the municipality prior to 2014); Many buildings in such neighborhoods are energy inefficient, and historic-preservation restrictions can impede retrofits.
- How the community will measure and evaluate the success of the Program (including the contribution of retrofits and capital improvements?)
- Does the Program include long term components that won't affect energy usage during the two years of Stage 3?

3. **Utility Data Reporting – please make sure that this Section does address the following:**

- How will the Program leadership be working with the electric and gas utilities that serve the community?

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<sup>12</sup> <http://www.earthtechling.com/2013/08/energy-efficiency-can-help-affordable-housing/>



- How will the utility identify residential energy consumers in order to aggregate their energy use?
- Is any multi-unit residential housing being excluded because of difficulties in identifying accounts and securing permissions (e.g., apartment buildings, condos, vacation communities, etc.)? If so, provide a rough estimate of the number of community residents that won't be included in the residential energy aggregation, and explain how the estimate was obtained. .
- How have the community and the utilities identified municipal accounts in order to aggregate their energy use?
- Are there any accounts where only a portion of the energy is used by the municipality (according to the criteria discussed in "[Municipal Accounts](#)")? If so, include a list of these accounts, noting which ones are being included (in whole or part) and which ones are being excluded (e.g., because the municipality consumes less than 20% of the energy billed to the account).
- A list of the municipal accounts (this list must be updated as appropriate during the competition, with GUEP being informed of all updates).

#### 4. **Innovation –**

- What's innovative about the Program? Relevant innovations include aspects of the plan that are completely new and different, as well as creative ways of implementing existing approaches. For example, existing approaches for financing energy retrofits have not been very effective, and experts believe that innovative financing could increase adoption rates significantly.

#### 5. **Potential for Replication –**

- Identify planned resources that could become a model for other communities. Examples include such resources as community-engagement or other systems, websites, documentation, personnel, etc.
- Identify any procedural aspects of the plan may be particularly well-suited for replication in other communities. Examples might include an innovative retrofit program, an innovative partnership between the community and the utilities that serve it.

#### 6. **Likely Future Performance -**

- Why are the energy-savings that will be achieved under the Program likely to be permanent? And why is the Program likely to yield additional savings, continually, after the competition? Here are some examples of topics that might be relevant:
  - How aspects of the Program could become institutionalized through policies and other means. One source for inspiration is ACEEE's [Local Energy Efficiency Self-Scoring Tool](#). Another source that might be useful is [ISO 50001](#)<sup>13</sup>, a standard that provides organizations with a framework for integrating energy performance into their management practices
  - Plans to "build capacity" to support continued efforts, such as professional development and business development efforts.

- What systems or approaches will be used to collect, manage, manage, and exploit relevant data? One possible example is the increasingly-common use of [Green Button](#)<sup>14</sup>, an industry-led effort to provide electricity customers with easy access to their usage data via a “Green Button” on their utility’s website. Green Button was developed in response to a [White House call-to-action](#)<sup>15</sup>. [Some electric utilities](#) have already adopted or committed to adopting Green Button.<sup>16</sup> For more information about Green Button, see the [NIST Smart Grid Collaboration Wiki](#)<sup>17</sup>. Another example is EPA’s [Portfolio Manager](#)<sup>18</sup> – an online tool for measuring and tracking the energy consumption of a building or portfolio of buildings. For other possible examples, see the Section [“Energy Efficiency Resources for Communities.”](#)

## 7. Education –

- How will the local K-12 school system be involved?
- What community-wide educational programs are planned?

## 8. Prize –

- Briefly describe preliminary ideas for how a prize would be used to promote and implement continued energy efficiency measures in a way that benefits the community as a whole, including all demographic and economic sectors. Communities that are selected later as Finalists for Stage 4 will have to include a detailed proposal in their Final Report

For additional details and examples of what might be included in the Program Plan, see the discussion of the Final Report that will be required from communities that advance to Stage 4 – [“Final Judging”](#).

Note that final judging will be based on the information in the Final Report, and not on the extent to which the community stayed with the original Program Plan. Communities are free to deviate from the Program Plan, but should keep GUEP informed about major changes.

### Optional Proposal for Funding

In addition to their proposed Energy Efficiency Program Plan, communities were invited to submit a proposal to receive seed funding from certain GUEP sponsors and partners. Some communities are also working to obtain seed funding from their local utilities, from local businesses, or from the community itself (e.g., via [Kickstarter](#)).

There were two specific seed-funding opportunities available to select GUEP communities.

1. Joyce Foundation Grants for Great Lakes Communities – These small seed grants (\$5,000 - \$30,000) were available to communities in WI, MN, IL, IN, MI, and OH. Applications for a seed grant, were to include a budget and summary of how the funds

<sup>14</sup> <http://www.greenbuttondata.org/>

<sup>15</sup> <http://www.whitehouse.gov/blog/2011/09/15/modeling-green-energy-challenge-after-blue-button>

<sup>16</sup> <http://www.greenbuttondata.org/greenadopt.html>

<sup>17</sup> <http://collaborate.nist.gov/twiki-sggrid/bin/view/SmartGrid/GreenButtonInitiative>

<sup>18</sup> <http://www.energystar.gov/buildings/facility-owners-and-managers/existing-buildings/use-portfolio-manager>

would be used specifically to advance an innovative and replicable portion of the overall Program Plan.

2. American Public Power Association DEED Grants for Public Utilities – Communities served by a publicly owned utility that is a member of APPA's DEED program, could apply for a seed funding grant to support their GUEP Program Plan<sup>19</sup>.

Grants under these programs have already been announced. If additional funding opportunities become available, they will be immediately sent to all competing communities as well as posted on [guep.org](http://guep.org).

### **Selection of Semifinalists**

Based on the Program Plans and seed-funding proposal reviews, the GUEP Semifinalist Selection Committee invited 50 communities to compete as Semifinalists in the Stage 3 performance competition.

Semifinalist selections were based primarily on the overall quality of the Program Plans and the extent to which they are innovative and replicable. We also tried to achieve regional diversity, population-size diversity, and diversity of the proposed energy-savings program approaches. All communities selected for the Semifinals must sign and return the Semifinalist Acknowledgement Letter by January 9, 2015. The letter is being provided to all communities along with the distribution of v8.0 of these Competition Guidelines

### **Stage 3 – Semifinalist Performance Competition**

During the 24 month Competition phase, participating utilities will provide the GUEP administrators and local community leaders with monthly aggregate community energy data (see "[Energy Consumption Reporting During Competition Stage 3](#)"), and the community will provide informal progress reports (blog, video, etc.) at least once every two months.

As mentioned in the Section "[Data from Local Utilities](#)", the first quarterly report, must include the community's baseline energy use for the 24 months prior to the start), and the gas and electricity cost (per energy unit) averaged over the entire baseline period.

All communities will also be required to supply a formal annual report after the 12<sup>th</sup> and 24<sup>th</sup> month of the Semifinalist competition. Annual reports will be brief summaries of actions taken during the year, including the number of residential energy efficiency retrofits, as well as any lessons learned and adjustments to the Program Plan that are made along the way. A template for the annual report will be provided at the beginning of the Semifinalist phase of competition.

Here is the full schedule of quarterly reports:

- May 15, 2015: First Quarterly Report (Jan - Mar, '15), including the 2013 and 2014 monthly baseline data, plus baseline average cost data
- Aug 15, 2015: Second Quarterly Report (Apr - Jun, '15)
- Nov 15, 2015: Third Quarterly Report (Jul - Sep, '15)

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<sup>19</sup> <http://www.publicpower.org/Programs/Landing.cfm?ItemNumber=31245&&navitemNumber=37529>

- Feb 15, 2016: Fourth Quarterly Report (Oct - Dec, '15), Plus Annual Qualitative Report
- May 15, 2016: First Quarterly Report (Jan - Mar, '16),
- Aug 15, 2016: Second Quarterly Report (Apr - Jun, '16)
- Nov 15, 2016: Third Quarterly Report (Jul - Sep, '16)
- Feb 15, 2017: Fourth Quarterly Report (Oct - Dec, '16), Plus Second Annual Qualitative Report

GUEP will publicize the competition status via a generally-available website. The informal progress reports will be posted there, and the monthly energy data will feed the performance dashboard (see [“Energy Consumption Reporting - The Performance Dashboard”](#)). The website will also offer general educational information about energy and energy efficiency, as well as links to relevant resource materials.

## **Stage 4 – Finalist Selection, Judging and Awards**

### **Selection of Finalists**

Based on 48 months of data (24 months baseline, 24 months Stage 3), up to 10 Finalists will be selected as follows:

All Semifinalists will be ranked by an Overall Energy Score (OES) that quantifies their energy-saving performance relative to the community’s baseline as a percentage change. The OES is based on the [Adjusted Source Energy Use per Residential Bill](#) (ASEU) averaged over the baseline and Stage 3 Performance Competition periods. In particular, given

$ASEU_B$  = ASEU averaged over the 24 months before the start of the Stage 3 Competition

and

$ASEU_C$  = ASEU averaged over the 24 months of the Stage 3 Competition,

the Overall Energy Score (OES) is defined as

$$OES = 100 \times (ASEU_C - ASEU_B) / ASEU_B$$

Decreased energy use will result in a negative OES, and the more negative the better. Note that for some communities the OES may be positive (increased energy use); the more positive the Energy Score, the lower the ranking.

The Energy Prize Team will select up to 10 Finalists from the top Semifinalists (i.e., the communities with the best Energy Scores, with the Energy Score being the primary factor. That is, all other things being equal, the highest ranking Semifinalists will advance to the Final. However, the Judging Panel may consider other outstanding factors, including extent of innovation, diversity of approach, size and geographic diversity, information about electric and gas vehicles (see [Electric and Gas Vehicles](#)), etc.

## **Additional Recognition**

The Prize Judges will also identify exceptionally worthy Semifinalists that did not make the Finals. The GUEP will recognize and publicize these communities by awarding an Energy Plan Certificate of Accomplishment.

## **Stage 5 – Finalist Judging**

### **Final Report**

Finalists will be invited to submit a Final Report within 60 days, addressing the following:

#### Competition Performance

- Summary of the energy-savings program, including any short- or long-term changes introduced during the two-year Stage 3 Performance Competition.
- General discussion of how well the energy-savings program has worked to date.
- Results of a certified, third-party audit of the (non-adjusted) Energy Use per Residential Bill data that was provided by utilities. (*Issue: how to arrange and finance this.*)
- Discussion of the role and effectiveness of energy retrofits and other capital improvements.
- Discussion of the role and effectiveness of any municipal incentives that were provided via local regulations, zoning, taxation, etc.;
- Discussion of the implementation and success of any program components that target high-return opportunities, for example:
  - Affordable housing;
  - Residential rentals;
- Buildings in historic neighborhoods (neighborhoods that have been formally designated as “historic” by the municipality prior to 2014); Optionally, if energy retrofits or other capital improvements were a particularly important and effective component of the community’s Program Plan, the community may also submit an Energy Retrofit Report that includes –
  - An accounting of the number and types of retrofits and capital improvements that were installed prior to the end of the Semifinal, and a description of how the data were collected.
  - A description and accounting of any formal energy audits that were conducted – examples include the DOE [Home Energy Score](#)<sup>20</sup> and audits according to the [Building Performance Institute](#)<sup>21</sup> or the [Residential Energy Services Network](#) (RESNET)<sup>22</sup>.
  - The total energy savings predicted by such audits for the 12 months following the end of the Semifinal.

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<sup>20</sup> [http://www1.eere.energy.gov/buildings/residential/hes\\_index.html](http://www1.eere.energy.gov/buildings/residential/hes_index.html)

<sup>21</sup> <http://www.bpi.org/what.aspx>

<sup>22</sup> <http://resnet.us/energy-audit>

- Optionally, if the community provided information about electric and natural gas vehicles after Stage 3, prior to the selection of Finalists (as mentioned earlier in the section [Electric and Natural Gas Vehicles](#)), the supporting evidence and proposed method for taking the effect into account should also be included in the Final Report. Again, it will be up to the Judging Panel to accept or reject the proposed method (which, if accepted, would be subject to audit).

#### Innovation

- Discussion of what’s innovative about the energy-savings plan, and how effective the innovations were. Relevant innovations include aspects of the plan that are completely new and different, as well as creative ways of implementing existing approaches. For example, existing approaches for financing energy retrofits have not been very effective, and experts believe that innovative financing could increase adoption rates significantly.

#### Potential for Replication

- Discussion of the likelihood of replication in other communities; here are examples of topics that might be relevant:
  - What resources were developed that other communities might use? Such resources might include community-engagement or other systems, websites, documentation, personnel, etc.
  - Are there aspects of the energy-savings program that are particularly well-suited for replicated in other communities?
- Lessons learned, and advice for other communities

#### Likely Future Performance

- Discussion of why the energy-savings achieved to date by the program are likely to be permanent, including evidence of widespread behavior change, and discussion of why the energy-savings program is likely to yield additional savings, continually in future years. Here are some examples of topics that might be relevant:
  - How have aspects of the energy-savings program been institutionalized through policies and other means? For example, this discussion could include the results of applying ACEEE’s [Local Energy Efficiency Self-Scoring Tool](#).<sup>23</sup>
  - To what extent has there been “capacity building” to support continued efforts? Examples might include professional development and business development efforts.
  - What systems or approaches are being used to collect, manage, manage, and exploit relevant data?

#### Equitable Access; Community and Stakeholder Engagement.

- Discussion of how the program was designed to reach diverse aspects of the community - geographic, demographic, functional, and economic (e.g., income distribution, owners vs. renters, etc), etc. – and to what extent it succeeded.

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<sup>23</sup> <http://www.aceee.org/research-report/e13/>

- Summary of how the community at large was engaged (including material used to engage) and evidence of how well it was engaged (e.g., how many people took a documented action a part of the program?).
- Summary of the role of the utilities (all electric and gas utilities serving the community) and evidence of how well they were engaged.
- Summary of the role of the municipal government, and evidence of how it worked together with the community).

Education

- Summary of how the local K-12 school system was engaged (including educational materials), and evidence of how well it was engaged.
- Summary of any community-wide educational programs.

Prize

- How would the projected prize be used to promote and implement continued energy efficiency measures in a way that benefits the community as a whole, including all demographic and economic sectors? This was covered briefly in the [Program Plan](#), but may have changed in the subsequent two years. Regardless, a detailed proposal should be included in the Final Report.

**Final Judging**

The Judging Panel will review the Final Reports and score them in seven categories, with a maximum score of 100:

<b>Category</b>	<b>Points</b>
Competition Performance	25
Innovation	15
Potential for Replication	15
Likely Future Performance	10
Equitable Access, Community and Stakeholder Engagement	10
Education	10
Overall quality and success	15

The highest-ranking community will be awarded first place, with the requirement that the benefit the entire community at large in accordance with spending proposed in the community’s Stage 2 Program Plan. Second and third place will also be awarded; these additional winners will receive special recognition and additional benefits.

All finalists will be subject to audits by the GUEP, e.g. to verify the performance data, to verify the enumeration of the utilities' municipal customers, etc.

### **The Judging Panel**

The GUEP Judging Panel will comprise distinguished, reputable, well-known individuals with diverse backgrounds in business, NGOs, education, and government. Collectively, the Judging Panel will have expertise in the technical, educational, business, political, and regulatory aspects of energy efficiency. It will also have expertise in existing community-wide energy-efficiency programs at both the city and state levels.

The Judges are likely to be individuals with many demands on their time, so GUEP will support them with a Judges' Advisory Council. The Council will respond to questions; provide summaries, perhaps provide recommendations, and generally be helpful based on detailed knowledge of the GUEP, the competitors, and the Final Reports.

## **Georgetown University Engagement**

In addition to managing the GUEP, Georgetown University will support the competitors by offering webinars at least quarterly, skills workshops, templates for news releases and other publications, and similar services.

Georgetown University is collaborating with partners to provide each community with technical support, resources, and other support that can help with the development and implementation of their energy efficiency plan. In addition, Georgetown University students, with the support of partners, will serve as Community Liaisons who will provide information and assistance to communities, while working to connect them with the full range of community resources and technical assistance that GUEP partners have available.

In addition Georgetown University students will work directly on the prize by:

- Spending time in a community, providing on-the-ground assistance and participating in experiential learning opportunities;
- Working with sponsors and partners to ensure that their resources and engagement are enhancing the educational, energy efficiency, and innovation objectives of the Prize;
- Serving as members of the Judge's Advisory Council (see "[The Judging Panel](#)"), and being represented on the final Judges Panel.

At the start of the two-year Stage 3 competition and at the end of the first year, we will host a forum at the University for GUEP competitors – an opportunity for them to exchange ideas, hear from experts and opinion leaders, and present progress. It will also provide an opportunity for visits with their House and Senate Members, as well as with DOE, EPA, and other relevant Executive branch offices.

In keeping with Georgetown University's role as an educational institution, GUEP competitors are required to involve their local school system, and the effectiveness of that involvement is one of the criteria for selecting winners. As mentioned earlier, Final Reports must address "how the local school system was engaged (including educational materials) and evidence of how well it was engaged.



To make it easier for communities to address these educational requirements, we are looking into coordination with the American Home Energy Education Challenge (AHEEC), a competition that was sponsored by DOE in partnership with the [National Science Teachers Association](#), in which students work to reduce the energy consumption of their home.

Likewise, we would like to coordinate with two organizations that specifically address energy education (and that support the AHEEC): [EnergyTeachers.org](#) and the [National Energy Education Development Project](#)<sup>24</sup> (NEED).

Long term, data from the GUEP will provide a research opportunity – for example, educators who are studying what does and doesn't work in energy education. All such shared data will be aggregate data that does not contain private information.

## Energy Efficiency Resources for Communities

One goal of the GUEP is to stimulate replicable innovations in community energy efficiency, but this does not mean that competing communities should start from scratch. Communities (together with their local governments and utilities) can and should learn from and, as appropriate, use the many resources that are available from governments, non-profits, and commercial companies.

We will publicize these and other resources in a [section of the GUEP website](#)<sup>25</sup>. We encourage their use, but there's no requirement to do so. Examples include:

- [DOE's Better Buildings Neighborhood Program](#)<sup>26</sup> - a collection of information developed for and by state and local governments describing successful strategies for designing and implementing residential retrofit programs. (DOE is also launching a peer sharing network and Solution Center that all GUEP competitors will be invited to use as beta testers of in 2014.)
- DOE's [Home Energy Score](#)<sup>27</sup> – a quick and easy tool that allows qualified assessors to
  - Generate clear, credible home energy assessments at a reasonable cost;
  - Recommend customized upgrades and other cost saving tips; and,
  - Help consumers compare the energy use of different homes;
- Various DOE guides, including
  - [Advanced Energy Retrofit Guide \(AERG\) for K-12 Schools](#)<sup>28</sup>
  - [Advanced Energy Retrofit Guide \(AERG\) for Office Buildings](#)<sup>29</sup>

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<sup>24</sup> <http://www.need.org/>

<sup>25</sup> <http://guep.org/resources-for-competitors>

<sup>26</sup> <http://www1.eere.energy.gov/buildings/betterbuildings/neighborhoods/>

<sup>27</sup> [http://www1.eere.energy.gov/buildings/residential/hes\\_index.html](http://www1.eere.energy.gov/buildings/residential/hes_index.html)

<sup>28</sup> <https://buildingdata.energy.gov/cbrd/resource/17>

<sup>29</sup> <https://buildingdata.energy.gov/cbrd/resource/19>

- [Community Strategic Energy Planning Guide](#)<sup>30</sup>
- [Strategic Energy Planning Guide for the Public Sector](#)<sup>31</sup>
- EPA's [Portfolio Manager](#)<sup>32</sup> – an online tool for measuring and tracking the energy consumption of a building or portfolio of buildings. In the case of GUEP, this is applicable to municipal buildings.
- HUD's [Guide to Energy-Efficient and Healthy Homes](#) – a consumer guide describing how to improve a home's energy efficiency and indoor environmental quality.
- [ICLEI - Local Governments for Sustainability](#)<sup>33</sup> – an association of cities and local governments dedicated to sustainable development
- Sources for energy education curricula, such as [EnergyTeachers.org](#) and the [National Energy Education Development Project](#)<sup>34</sup> (NEED)
- Energy saving cloud services and apps (We believe that the Internet, the cloud, social media, GPS, and smart-phones have come together in way that can provide new technology for crowd-sourced energy efficiency among a community of users). Some emerging examples:
  - DOE's "[Apps for Energy](#)" competition<sup>35</sup>;
  - City of [Chicago apps competition](#)<sup>36</sup>;
  - The DOE-Livermore-Laboratory [Home Energy Saver](#)<sup>37</sup>;
  - EPA's [Energy Star Portfolio Manager](#)<sup>38</sup>;
  - The Delaware Electric Co-Op "[Beat the Peak](#)"<sup>39</sup> indicator light (for communicating load information to utility customers)
- Commercial companies that help consumers to understand, track, and reduce their energy consumption; examples include:
  - [Opower – partners with utilities to provide household-specific energy-efficiency information and advice](#)
  - [EcoFactor](#)<sup>40</sup> - works with utilities and homeowners to reduce energy consumption via internet-connected programmable thermostats
  - [C3 Energy](#)<sup>41</sup> - offers software solutions to help organizations understand, optimize, and report on their energy use.

<sup>30</sup> [http://www1.eere.energy.gov/wip/solutioncenter/strategic\\_energy\\_planning\\_guide.html](http://www1.eere.energy.gov/wip/solutioncenter/strategic_energy_planning_guide.html)

<sup>31</sup> <http://www4.eere.energy.gov/alliance/activities/public-sector-teams/community-strategic-energy-planning>

<sup>32</sup> <http://www.energystar.gov/buildings/facility-owners-and-managers/existing-buildings/use-portfolio-manager>

<sup>33</sup> <http://www.iclei.org>

<sup>34</sup> <http://www.need.org/>

<sup>35</sup> <http://appsforenergy.challenge.gov/>

<sup>36</sup> <http://www.appsformetrochicago.org/>

<sup>37</sup> <http://homeenergysaver.lbl.gov/consumer/>

<sup>38</sup> [http://www.energystar.gov/index.cfm?c=evaluate\\_performance.bus\\_portfoliomanager](http://www.energystar.gov/index.cfm?c=evaluate_performance.bus_portfoliomanager)

<sup>39</sup> <http://www.delaware.coop/beat-peak/indicator-light>

<sup>40</sup> <http://www.ecofactor.com>

<sup>41</sup> [www.c3energy.com](http://www.c3energy.com)

- [Itron](#)<sup>42</sup> – provides utilities with energy-management products, services, and analyses
- [Enterprise Community Investment](#)<sup>43</sup> - a for-profit company dedicated to affordable housing, with a specific program for [Green Communities](#)<sup>44</sup>.
- [AmericanEfficient](#)<sup>45</sup>
- [Building Energy, Inc.](#) – provides software tools for exploiting data about energy use
- Non-profits with a focus on energy-efficiency; examples include:
  - [The Joyce Foundation](#)<sup>46</sup> – focused on improving the quality of life in the Great Lakes region, including community energy-efficiency.
  - [SmartPower](#)<sup>47</sup> - a non-profit marketing firm dedicated to promoting clean, renewable energy and energy efficiency.
  - [Vermont Energy Investment Corporation](#)<sup>48</sup> - a nonprofit dedicated to reducing the economic and environmental costs of energy consumption, VEIC designs programs that reduce energy use through energy efficiency and renewable energy. VEIC is member of DOE's Technical Assistance Program team.
  - [The Home Performance Resource Center](#)<sup>49</sup> - a national not-for-profit organization formed to conduct research and education concerning the field of home energy performance
  - [The Energy Foundation](#)<sup>50</sup> – awards grants to promote the transition to a sustainable energy future by advancing energy efficiency and renewable energy
  - [Enterprise Community Partners](#)<sup>51</sup> – a non-profit associated with Enterprise Community Investment (see above), with a particular focus on financing
  - [Living Cities](#)<sup>52</sup> – a collaboration of the world's largest foundations and financial institutions, dedicated to improving low-income communities
  - [JPB Foundation](#)<sup>53</sup> – focused on improving the quality of life in low-income communities, including environmental sustainability
- Retrofit technologies, installation examples, and services (e.g., see [DOE's Building America program Solution Center](#)<sup>54</sup>)
- Retrofit financing models

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<sup>42</sup> <https://www.itron.com/>

<sup>43</sup> <http://www.enterprisecommunity.com/>

<sup>44</sup> <http://www.enterprisecommunity.com/solutions-and-innovation/enterprise-green-communities>

<sup>45</sup> <http://www.americanefficient.com/>

<sup>46</sup> <http://www.joycefdn.org/>

<sup>47</sup> <http://www.smartpower.org/>

<sup>48</sup> <http://www.veic.org>

<sup>49</sup> <http://www.hprcenter.org/about-us>

<sup>50</sup> <http://www.ef.org>

<sup>51</sup> <http://www.enterprisecommunity.com/>

<sup>52</sup> <http://www.livingcities.org/>

<sup>53</sup> <http://jpbfoundation.org/>

<sup>54</sup> <http://basc.pnnl.gov>

- Other innovative financing mechanisms (e.g., [Kickstarter](#))<sup>55</sup>
- Certified energy audits
- Alternative energy sources (solar, wind, geothermal, etc.)
- Long-term energy-saving devices (appliances, lights, smart thermostats, etc.)
- [ISO 50001](#)

## FAQs

Although we have reasons for the choices we've made, we acknowledge that a more expansive competition could lead to greater change. But we can't do it all – complexity goes way up and with it goes manageability, gaming issues, resource issues, judging controversies, etc. Keeping the competition's long term goal in mind (community energy efficiency), we think that the restrictions we've made are a reasonable balance between complexity and expansiveness.

### **Why restrict the competition to municipalities with populations between 5,000 and 250,000?**

First, note that this definition of eligible communities includes 65% of the U.S. population.

Regarding cities with populations greater than 250,000, many such cities already have long-term energy and environment programs (with major funding and staff), which would give them an unfair advantage. It might be possible to create a fair competition, but that would complicate the prize rules and administration. Large size disparities between competing communities could easily lead to unforeseen advantages that spoil the competition. Furthermore, the need is greater in smaller communities, which typically do not have such aggressive energy and environment programs (with major funding and staff).

At the other extreme, some towns with very small populations could easily achieve high participation rates, giving them an unsurmountable advantage; hence the lower limit of 5,000. Note, however, that GUEP will also consider applications from “combined communities” – communities with common borders that together have a total population greater than 5,000 (see [“Eligible Communities”](#)).

### **Why normalize the total residential and municipal energy use by the number of residential bills?**

To enable fair comparisons, it's essential to adjust the total gas and electric energy use to account for differences in community size. One obvious approach (indeed, our initial approach) is to compute the total energy use per capita. But this has two major problems. One is that community populations can change significantly during the two-year competition period, but there's no easy and authoritative way to measure that.

The other problem is fuel-switching. For example, if there's a trend to switch from heating via fuel oil to heating via gas or electricity, the total gas and electric energy per capita would increase, thereby penalizing the community unfairly. (Indeed, depending on the situation, such fuel-switching can increase overall energy efficiency and decrease greenhouse gas emissions, so it would be particularly pernicious for the GUEP to penalize such a trend.)

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<sup>55</sup> <http://www.kickstarter.com/>

To avoid these problems, we will normalize by the number of residential bills. This has several advantages:

- It avoids penalizing communities for switching to gas or electricity. (The total energy use increases, but so does the number of residential accounts.)
- It avoids penalizing (or rewarding!) communities for changes in population size. (The number of residential bills is highly correlated with population size.)
- The number of residential utility bills is easily measured as it changes over time.

Note that we will normalize both residential and municipal energy use by the number of residential bills (rather than normalizing residential use by the number of residential bills, and normalizing municipal use by the number of municipal bills). This makes sense because the main purpose of the municipal government is to serve the residents. It's also simpler.

### **Why not adjust for inherent advantages or disadvantages that could stem from having (or not having) a pre-existing community-wide energy efficiency program?**

Some communities may have a “head start” – inherent advantages such as existing energy efficiency programs with existing municipal staff, smart meters, and access to State funds for clean energy deployment<sup>56</sup>. Why not take this into account?

On the other hand, communities that don't have such a “head start” may have a different inherent advantage: the availability of “low hanging fruit” that “head start” communities have already picked. Why not take this into account?

So it's unclear whether it's more advantageous to be a “head start” community or a “fresh start” community.

It may be true that “fresh start” communities have an advantage with respect to reducing the Adjusted Energy Use per Residential Bill. On the other hand, an important Final Judging criterion is the likelihood of continuing change, not just two years of change. And in this respect “head start” communities with well-established energy-efficiency programs may have an advantage.

We believe that possible advantages or disadvantages of “head start” vs., “fresh start” will balance. Besides, it would be complicated, difficult, and controversial to specify entrance or judging criteria that address this issue.

That said, the selection of semifinalists for Stage 3 includes a subjective component, and the GUEP Judging Panel could choose to exclude communities that have too much of a head start (and in fact really don't need GUEP) and likewise exclude communities that have achieved dramatic improvements in energy-efficiency but haven't implemented a long-term energy-efficiency program.

### **Why not adjust for economic differences?**

Since major economic changes can lead to reduced or increased energy use independent of community efforts, and since rich communities have more resources than poor communities,

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<sup>56</sup> <http://www.nrel.gov/docs/fy11osti/49340.pdf>

we considered having the Adjusted Energy Use per Residential Bill include an adjustment based on economic considerations.

This would have been essential if industrial and commercial energy use were to be included (vs. just residential and municipal). For example, the opening or closing of a major factory could have significant effects. Indeed, this is one of the reasons for excluding industrial and commercial energy use.

Even with the restriction to residential and municipal energy use, one can argue that an economic adjustment should still be made. For example, in the absence of creative financing models, wealthy communities may have an advantage in being able to afford more retrofits and energy-saving appliance replacements.

But there are counterarguments; for example, wealthy communities may have the means to purchase retrofits, but they also generally buy newer, more efficient houses to begin with. On the other hand, GUEP challenges communities to develop creative financing models for retrofits that do not require cash from residents, and we want to retain the incentive to do so. Similarly, we hope that lower-income communities will be creative in the cost or financing of other energy saving measures. For these reasons, and also because it would add considerable complexity to the GUEP rules, we chose not to adjust for economic differences.

### **Does a community in a temperate zone have a disadvantage?**

No, because the [basic figure of merit](#) adjusts for weather based on the number of heating and cooling days.

### **Why use fixed national rather than varying regional source energy factors?**

An alternative to using national average source energy factors would have been to use factors that are more community-specific, which in principle could account for regional or even local variations in energy generation. Unfortunately, such regional factors can be controversial, as they're based on estimates, averages, and modeling assumptions, and there's no single, validated, nationally accepted standard.

In principle, regional source energy factors could also account for changes in energy generation that utilities might make during the course of the 24-month Performance Competition, but that's not possible because the approaches for determining regional factors are based on data that's several years old, and there's no nationally accepted means of updating regional factors on an annual basis.

Using regional source energy factors would have been complicated and confusing, and would result in real or perceived unfairness in comparing communities, which is why GUEP has accepted the U.S. government recommendation to use national averages that are fixed for the duration of the competition.

Overall, including source energy in the figure of merit via national factors should create additional incentives for communities to reduce their utility-supplied-energy, while educating the public on the full-fuel-cycle effects of the energy they consume, and the importance of working toward a more efficient national energy grid.

**The prize is awarded based on a combination of objective figures of merit and expert opinion. Why not award the prize entirely based on objective figures of merit?**

We want the GUEP to lead to continuing improvements after the competition, and to replication in other communities. These aspects require subjective judgments following the Competition Stage – to develop an objective figure of merit would be difficult and controversial. Note that we do specify the judging criteria and the quantitative weights that will be applied to the judged score for each criterion.

**Why restrict the energy consumption to residential and municipal? Why not commercial, industrial, transportation, etc.**

We omitted transportation because it is too difficult to measure in a simple way (unlike energy from utilities).

We chose residential plus municipal because our focus is on communities, including public schools, and we believe that long-term energy-saving actions will require the cooperation of community citizens and community-selected municipal leaders. Municipal energy use is included in the scoring to provide an incentive for the municipality and the community to work together, and providing seed funding will facilitate that work.

Another reason is to keep the playing field relatively level. Including commercial and industrial energy uses complicates things because these sectors are more likely to be responsive to economic and business forces outside of the community (market conditions, ownership, etc.). In addition, including these sectors could give certain communities an overwhelming advantage (since committed commercial and industrial consumers can produce relatively large increases in efficiency).

Finally, excluding these sectors reduces the problem of economic normalization (what if a big factory opens or closes?; likewise large commercial consumers).

Of course we hope that the community efforts spread to these other sectors, and it seems reasonable that to some extent this will happen – thus, in some way we are affecting commercial/industrial usage even though we exclude them from the competition.

**Why restrict the measurement of energy consumption to electricity and gas?**

We recognize that electricity and gas do not account for all residential and municipal use, the primary omission being oil and propane used for heating. Unfortunately, measurable energy use is essential to the prize design, and there's no straightforward way to measure the use of these other energy sources uniformly and with adequate accuracy.

Note that it is not required that a community has both gas and electric services. Also, there's no inherent advantage to having both, since performance is measured by the percentage reduction of energy used during the competition period vs. the baseline period.

**What happens if the municipal or community leadership changes during the competition?**

We recognize that leadership changes are likely during the course of the competition, but we consider that to be something that the community has to deal with.

## **Acknowledgements**

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