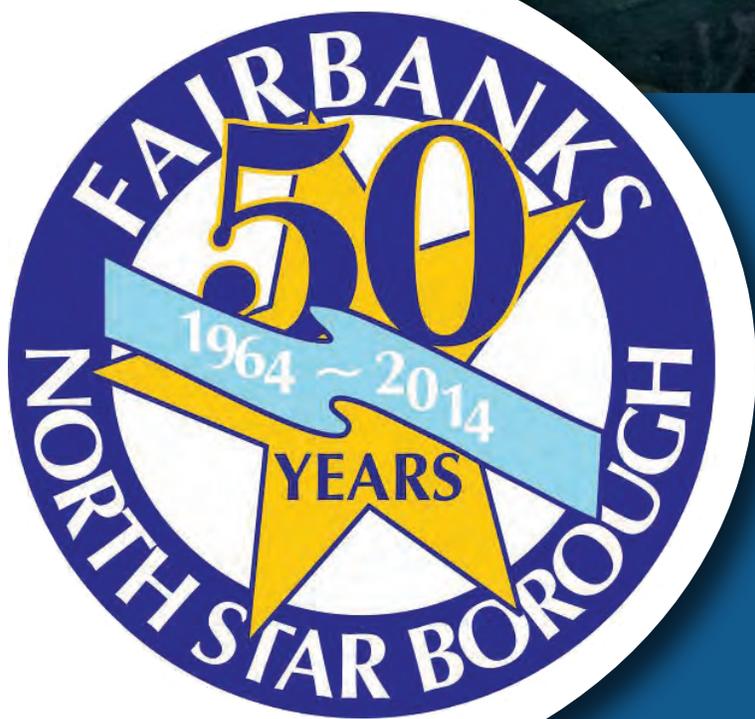


Stage 2 – GUEP Quarterfinals

Fairbanks North Star Borough's Energy Efficiency Program Plan



Fairbanks North Star Borough

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Associated Project Partners:

- Fairbanks North Star Borough
- Golden Valley Electric Association
- Cold Climate Housing Research Center
- Fairbanks North Star Borough School District
- Alaska Center for Energy and Power
- University of Alaska Fairbanks
- City of North Pole
- North Pole Economic Development Corporation

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Introduction

Fairbanks North Star Borough welcomes the opportunity to join with other participants in the Georgetown University Energy Prize competition in the development, implementation and sharing of compelling strategies and tools to achieve significant, and sustainable, energy efficiency improvements in the mid-size communities of America.

Our program is carefully tuned to the way energy is used in our community. In addition to typical domestic and civic uses of electricity, our location less than 200 miles south of the Arctic Circle drives the need for extended wintertime exterior lighting and electric heaters to protect vehicle engines. Heating is a major component of energy usage in the Borough, with the vast majority of residential consumers relying on heating oil and wood fired devices for space heating. The majority of natural gas consumption occurs in commercial or municipal buildings and schools.

Our program will incorporate a range of activities designed to target specific audiences and demographics. We leverage existing utility and state programs, and benefit from the opportunity to beta test two novel tools developed by at the local University of Alaska campus. Throughout this program, we seek to build on the community's care for and commitment to facilitating a sustainable future for future generations.

Fairbanks North Star Borough - background

The Fairbanks North Star Borough (FNSB) is located in Interior Alaska, with a total land area of 7,444 square miles – roughly the size of New Jersey. The borough seat is the City of Fairbanks with a population of 32,700; the City of North Pole is also located in the borough with a total population of 2,117. The remaining ~55,000 residents are distributed across smaller, unincorporated communities and rural areas. The borough is home to two major military bases – Fort Wainwright, and Eielson Air Force Base. The main campus of the University of Alaska system is also located in Fairbanks. Both military bases and the University operate their own coal fired heat and power plants.

The local electric utility is Golden Valley Electric Association. The electric cooperative derives power from coal, natural gas, wind, hydro and oil. Most residential consumers heat their homes with heating oil and/or wood. There is a limited natural gas distribution system in place, serving mainly non-residential consumers. Gas is currently trucked to Fairbanks from Cook Inlet. In addition, there is a limited steam district heating system providing space heating to the core of downtown Fairbanks. There is a plan in place to dramatically increase the natural gas distribution network in the Borough and truck gas from fields in Prudhoe Bay beginning in 2016.

Section 1) Program Management and Partners

Description of Program leadership and management

The Fairbanks North Star Borough's (FNSB) energy efficiency program will be designed and managed by a steering committee comprised of members carefully selected for their interest and leadership with key organizational stakeholders. In addition to representation by local government, the school district, the local University and the electric cooperative, the GUEP steering committee has members from two energy research institutions and an economic development agency. Steering committee members, their affiliations and commitments from their organizations are:

- Luke Hopkins, Mayor of the Fairbanks North Star Borough. The mayor and the assembly provided funding for an intern through the application process and are committed to housing program employees should our Program Plan be accepted. The borough will provide office space and equipment for staff.
- Mike Wright, Vice President of Transmission & Distribution, Golden Valley Electric Association (GVEA). GVEA also contributed funding during the application process and will continue to support the program through the competition phase. GVEA has offered to configure residential accounts to match specific competitions (i.e. schools).
- John Davies, Senior Researcher of Energy Policy at Cold Climate Housing Research Center (CCHRC). John is also serving his second term on the FNSB Assembly. CCHRC is an industry-based, nonprofit corporation created to facilitate the development, use, and testing of energy-efficient, durable, healthy, and cost-effective building technologies for people living in circumpolar regions around the globe. CCHRC will provide advice, expertise and office space if needed.
- Heather Rauenhorst, Fairbanks North Star Borough School District (FNSBSD), Director of Grants & Special Projects. The school district will participate in the GUEP competition through the K-12 program component and through any applicable facility retrofits or operational changes.
- Gwen Holdmann, Executive Director; George Roe, Research Professor; Max Frey Program Assistant; University of Alaska Fairbanks, Alaska Center for Energy and Power (ACEP). ACEP mission is to be responsive to immediate and long term needs of residents, industries and agencies and focuses on research related to community and industry-scale power generation, transmission, heating, and transportation fuels and as such brings a needed element to the Fairbanks team. ACEP contributed to funding the intern and will play a significant, active role during the competition phase including the development of the website and innovative tools enabling our program.
- Nadine Winters, part-time executive director of North Pole Economic Development Corporation and consultant. Nadine has extensive experience with community development projects and will supervise staff during the competition.
- Bryce Ward, Mayor of the City of North Pole. The City has municipal facilities, including a water & sewer utility. Its role will be to help reduce municipal facility energy use and to reach out to the residents of North Pole for EE programs.

How will the program be staffed and funded?

The steering committee will provide program design and overall management of the project with one steering committee member responsible for supervising employees. The Fairbanks/North Pole team anticipates the need for two staff members during the competition. One part-time position with strong marketing and development skills will be recruited. The position will work half-time for the two year period. The second position will do community outreach and assist the other position with development. The second position will be an AMERICORPS/Vista volunteer (the application for the position has already been submitted). The VISTA position will be full-time for two years. Funding for the position and advertising will come from program partners, statewide energy affiliated organizations and corporate donors. Fundraising by steering committee members has already begun.

How will the community at large be engaged and motivated?

Based on energy usage statistics from 2013, FNSB is targeting its energy efficiency improvement campaign on electricity use in all building types, with special attention on residences; and to a lesser degree, natural gas in municipal / school buildings and residences (only 2% of homes use natural gas for space heat). FNSB's GUEP program will emphasize energy efficiency behavioral change, seeking to establish awareness and lifestyle changes that will endure long past the time of the competition. A compelling web-based challenge program will be launched as part of that effort. In addition, there will be active engagement with students via classroom and extra-curricular energy-related learning opportunities and student-originated neighborhood activities. A variety of community competitions will be hosted over the 24 months in the GUEP timeframe, with prize types and values that should interest members from all sectors of the borough. FNSB will be working with community groups and businesses to support the effort by raising energy awareness among group members and employees.

All components of the Fairbanks GUEP will incorporate one or more of the following tenets of behavior change in order to motivate and engage community members:

- Reciprocity: this is the free sample idea; you're more likely to be persuaded by someone who gives you a gift, however small.
- Commitment and constancy: people who (voluntarily) make clear public commitments are more likely to carry through with them.
- Social proof: this is the bandwagon effect, people are definitely affected by what the majority of people are doing (or at least what they perceive the majority is doing).
- Rewards: tying behavior, i.e. turning off the lights when you leave the room, to a reward that is relevant, i.e. a new high efficiency flat screen television
- Liking: you're more likely to be persuaded by someone who you like or someone you think is similar to you in beliefs or background.
- Scarcity: the limited time only offer, basic economics of supply and demand.

Efforts to educate the community about the program and related activities will occur through traditional advertising – radio, print and television – and the more labor intensive networking and outreach approach.

Fairbanks program will incorporate a website and smart phone apps to facilitate the various competitions. According to the Pew Research Center, fifty-eight percent of residents nationally have smart phones (74% of people aged 30-49 and 83% of people aged 18-29). 2011 U.S. Census data indicates that 75.9% of people in the community have personal internet access. This allows for a large percentage of the community to be affected by a website and smart phone app-based competitions.

Additionally, 36% of households in the FNSB have school aged children; reaching out to the community through the schools will encompass all social and economic groups.

How will the local government be involved? What commitment will they make?

Local government is an integral part of the Fairbanks/North Pole program. Two mayors (Fairbanks North Star Borough and City of North Pole) sit on the steering committee and are committed to the project through 2017. The Fairbanks North Star Borough Assembly has already voted to accept and match funds for an intern position through the application stage. The borough has provided office space and equipment for the intern and will do so for future positions associated with the competition.

Both local governments will continue to pursue long-standing goals of reducing operating costs of municipally owned facilities (including schools) through increased energy efficiency. Energy savings opportunity awareness campaigns will be hosted to involve municipal employees in both their at-work and at-home energy usage roles.

Municipal incentives that are planned via local regulations, zoning, taxation, etc.

Currently, there are no planned regulation, taxes or zoning changes.

Involvement of businesses or business groups

There are many avenues available to engage the business community; the Fairbanks GUEP program will use all that are practicable. There are industry groups (i.e. Alaska Miners Association), service organizations (Rotary groups) and large employers.

In order engage the business community, steering committee members and staff will contact the chief executive officers of the largest employers in the community and ask for their assistance by accessing their employees to participate in the program. In addition, organizations such as the Chamber of Commerce, Rotaries and member organizations like the Associated General contractors will be contacted. They will be asked to help engage their employees or other businesses in a particular industry to participate in an energy use competition. The approach will combine traditional media (print materials) with outreach (person to person contact) and utilize a number of behavioral change components. 1) Liking – one construction company challenging another; 2) social proof – the more employers participate, the more others will participate and 3) commitment and constancy – those that make a public commitment are more likely to follow through.

A number of large businesses in the community have already expressed interest in participating in the program.

Any benefits and incentives available from local utilities via official Energy Efficiency Programs; Involvement of other partnering organizations (including letters of commitment, if available)

The recent nationwide recession left Alaska and Fairbanks largely untouched. The recent rise in the cost of a barrel of crude oil has had a far greater impact on Fairbanks and other Alaskan communities. Although the State derives the large majority (82%) of its revenue from oil and gas, the rise in prices has negatively affected many of its communities as a result of the concurrent rise in the cost of electricity, space heat and transportation. The cost of heating oil in Fairbanks rose 63% since November of 2005 (\$2.44-\$3.85). The average cost of a kilowatt hour rose from \$0.17 to \$0.24, a 41% increase from 2008.

The State of Alaska and Golden Valley Electric Association have made some adjustments in response to the high cost of energy. There are no mandated programs in the state or locally, although the state has a publically stated goal of improving energy efficiency by 15% between 2010 and 2020. The state and GVEA have energy efficiency retrofit and educational programs designed to reduce residential energy usage.

GVEA started a home energy audit program in 1992 – Home Sense. Over the course of twenty years, 7958 residences (out of 38,000) availed themselves of the program, resulting in an estimated 44 million kilowatt hours (kWh) saved. The program cost just over \$2 million dollars over the twenty year period. This equates to an estimated kWh cost saved at 5 cents compared to the average utility cost of 18 cents (in 2012 dollars) to generate that power. Home Sense program components include a discounted home energy audit, information on energy saving, energy efficient light bulbs and car plug-in timers (cars need to have plug-in block heaters during the winter in Fairbanks). GVEA charges \$40 to customers, although GVEA frequently offers the program at no cost. It is interesting to note the program participation levels over the years. Between 1992 and 2005 an average of 296 residents per year participated. After the increase in energy costs, participation levels per year rose by 85% and have since leveled off at over 600 a year. GVEA is currently shifting focus of the Home Sense program to education and community awareness; they are an active partner in Fairbanks' GUEP program.

At the state level, the Alaskan Housing Finance Corporation's (AHFC) mission is to provide Alaskans access to safe, quality, affordable housing. The mission has expanded to energy efficiency and weatherization programs. AHFC has three statewide programs aimed at increasing energy efficiency:

- To promote the energy efficiency of existing and new constructed homes, AHFC offers interest rate reductions to homebuyers for properties meeting certain criteria
- The Home Energy Rebate Program provides Alaskans (regardless of income) up to a \$10,000 rebate for pre-approved energy efficiency improvements including materials and contracted labor
- Weatherization program provides individuals who meet certain income levels (low to moderate) weatherization services provided by an approved contractor at no cost to qualified applicants

AHFC's experience with energy efficiency programs is similar to that of other jurisdictions nationwide. When energy prices increased, there was a sharp increase in the number of applications, followed by a considerably lower, flat number of applications. Program managers likened energy efficiency programs to a church. Those who avail themselves of programs are choir members (i.e. singing to the choir). The important and harder part is to get the congregation involved in programs. And after that happens, perhaps the agnostics will participate as well. In Fairbanks, since program inception, 2361 residents participated in the Home Energy Rebate program and 892 participated in the Weatherization program. There are a total of 38,000 residences in the community. AHFC and the Fairbanks partnership have a shared goal of increasing participation in energy efficiency programs.

Another state agency, the Alaska Energy Authority (AEA), has a mission to reduce the cost of energy in Alaska. As such, AEA has energy efficiency programs, of particular interest is their public education and outreach program. It is cornered on their website (www.akenergyefficiency.org) that offers everything from savings calculators to tools for teachers. The public outreach and education program also works to improve the coordination of efforts promoting the adoption of greater end-use efficiency measures through information sharing and integrated planning. Fairbanks GUEP program is interested in realigning the wheel, not reinventing it. AEA has developed television ads, a mascot and other public information materials that can be used in Fairbanks and North Pole.

Both state agencies have agreed to provide relevant assistance to Fairbanks in pursuit of the Georgetown University energy prize, and have provided letters documenting their support.

Involvement of citizen's groups and major landlords

Once the stage two application is accepted, Fairbanks steering committee will contact various citizens groups and seek assistance and participation in the competition. In general terms, the program will contact groups and enlist their support in the competition. For example, high school Key Clubs take on service projects – they would be a natural fit as they are motivated to effect change and are required to conduct community projects. The Northern Alaska Environmental Center will be inclined to participate by virtue of their membership. The Fairbanks Engineering Society will be contacted as they will be interested in results and numbers – a group whose members are likely to participate. The groups are prevalent, it is a question of identifying all of them, identifying a motive and being systematic in garnering their support and participation. The steering committee members will bring a strong advantage to the citizen's group component – members have broad knowledge of groups and their potential.

Major landlords have been contacted in the course of determining the program design. Different properties have varied circumstances. Some pay a portion of the electric bill and have tenants pay when they exceed certain usage. Some have already retrofitted electrical fixtures in common areas but not in rental units and some have already installed low energy appliances in units. Again, a systematic approach to major landlords will be applied during the competition in order determine where the maximum energy efficiencies can take place.

Involvement of other partnering organizations

As stated earlier, the state agencies, the Alaska Housing Finance Corporation and the Alaska Energy Authority will offer whatever assistance they can to the Fairbanks program. The steering committee members represent other partnering organizations – local government, local utility, the school district, the university energy research organization, an economic development organization and a cold climate research organization.

Section 2) Energy Savings Plan

Overall summary of the planned program, including relevant methods and technologies

Energy is expensive in Fairbanks. Ninety-eight percent of residents use heating oil or wood for space heat, the remaining 2% use natural gas. Until recently, power was locally generated by diesel, other petroleum products, or small coal-fired power plant, with additional power wheeled to Fairbanks from distant hydro and natural gas generation in Cook Inlet, 400+ miles away. This has led to electricity costs of .24 per kilowatt hour, twice the natural average. Fairbanks has made some adjustments in response to the high cost of energy. Golden Valley Electric Association constructed an 18 MW wind farm and is working on a clean coal project to augment existing generation and reduce reliance on diesel and other petroleum products for power generation. They have also encouraged residents and businesses to lower their energy consumption and have funded a number of retrofits, resulting in a 10% decline in average residential consumption over the past decade. The community as a whole is working diligently to access natural gas supplies via a pipeline or trucking for space heat. Although there are significant opportunities for savings in both heating and electric power, but our program focuses on reduced

electricity consumption as heating methods used by the vast majority of our residents (heating oil and wood) does not qualify under the GUEP.

The proverbial low-hanging fruit of energy efficiency programs has already been picked. Fairbanks faces the same “stuck” problem others experience – a certain (relatively small) percentage of residents avail themselves of energy efficiency programs but it is difficult to engage the larger community in programs. We are now planning to take a methodical, coordinated approach to energy efficiencies with the use of some creative tools and extensive outreach efforts. Our four target audiences are residents with school age children, residents without school age children, businesses with employees and landlords of properties with a large number of rental units. In order to engage our target audiences, the program will utilize four primary tools:

- Smart phone app primarily for use with the residents with school age children target audience (k-12 program). It will allow users to track potential savings associated with their energy-saving activities and tie the savings amounts into progress toward a potential reward. Fairbanks does not have smart meters, so the app will be a tool to estimate and track progress. Verification of progress will occur on a monthly basis through electric bills
- Smart phone app, inspired by ‘Gym Pact’, a healthy living smart phone app. Based on the simple behavioral economics principle that people are more motivated by NOT losing money than by simply earning money, the app will have three components 1) commit – residents will make a monthly Pact to complete discrete, measurable activities that will save energy. Users will set what they’ll pay other Pact members if they don’t reach their goal; 2) meet the goals – use the Pact app to track progress; 3) reap the rewards by earning cash for saving energy, paid for by members who don’t reach their goal. The target audience for this app is residents without school age children and employees of businesses.
- Web platform that provides overall program information and specifically allows residents to identify and track savings associated with their behavior. The web platform will act as “home base” for the program and also provide tools for those residents who cannot use the smart phone apps. It will also provide a link to GVEA’s website so consumers can gauge their actual savings/energy reductions by reviewing their monthly bills
- A web mapping application that will allow residents to enter in the location of their residence, along with information about their energy use. The application would be used to generate statistics about energy savings within defined geographic boundaries, such as school attendance area boundaries. The data gathered can also be used to feed an “information dashboard” that would be part of the web platform “home base.” A screen shot of the mapping application is attached.

The K-12 component of our program will include competitions, a mascot and EE curriculum that is already approved by the State Board of Education. District wide, there will be a kilowatt hour drive, similar to penny drives, where school aged children compete with others in their school and other schools for energy reductions at home. GVEA has the ability (and willingness) to group residential accounts either by individual accounts based on student names, addresses or by school attendance areas. The smart phone app that estimates and tracks savings and the website will both be used as tools. There will be age appropriate prizes for top competitors and teams. We anticipate the students having an impact on their parent’s behavior. Homes with school-aged children tend to have more occupants than those without, so the potential for improved energy efficiency is great.

For adults without school age children, the Program will focus changing behavior using a smart phone app that executes a very simple concept of using negative reinforcement (a monetary penalty) to promote positive behavior (reducing energy use). Inspired by 'Gym Pact', which was designed to encourage healthy lifestyles, the app will be developed at the University of Alaska Fairbanks. We anticipate this app could be applied to other markets and will ensure it is developed with adequate flexibility to ensure it is easily transferable. The app will allow users to make a twofold commitment for each month, including 1) set a target for making home improvements that will directly result in energy savings; and 2) agree to a fine for not achieving the goals they have set for themselves. Then, at the end of the month, those that succeed in carrying out their pact are rewarded the money paid out by the users who did not meet their goals. Gym Pact claims to have a 90% effective rate by achieving the delicate balance of reward/punishments systems. By having users commit to a lower amount for the reward and a higher amount for the penalty, the successful payment pool effectively comes from the participants that did not make their goal. Included in the app will be an energy savings calculator that will let users estimate how much their energy savings accomplishments will save them. The user could select a timeline on a monthly basis, then select a pledge, for example, having the lights on only 4 hours a day, or technological solution of switching to CFLs and calculate the savings. Going to 4 hours a day for a month would save 192 kWh or over \$46 (dinner for two). Going to CFLs could save \$907.76, enough for a trip to Hawaii.

The Fairbanks Program will enlist the support of employers in the borough, both large and small, in order to engage their employees in energy efficiency efforts. Reaching out to the largest employers can potentially have a greater return on a time investment – the top 25 employers in the borough employ approximately 16,750 workers out of a total 46,250 civilian employees. The top employers are the federal, state and local governments, Banner Health (which runs the hospital and a large primary care clinic) and the University. With little difficulty the steering committee can engage the large employers with a reasonable chance of success. Individual employers will be consulted on the method most likely to lead to reduced energy consumption by their employees – whether the 'Energy Pact' smart phone app or the more generic smart phone and web app that allows employees to track their behavior and correlate it with a reward. In addition to large employers, the program will pursue smaller employers, through business service groups such as Rotaries and the Chambers of Commerce. Employers can assist with determining whether competitions amongst their employees, other employers or neighborhoods would best motivate each group of employees.

Rental units make up 41% of housing in the community; 24% of the rental housing is multi-family. Landlords of major rental units will be contacted, based on a list from the Borough Assessing Department property data base. Preliminary research suggests varied circumstances for rental housing. Some include the cost of electricity in the rent, some don't and in some cases the landlord pays up to a certain amount and the tenant pays the rest. Also varied is the energy efficiency of appliances and lighting in the rental units. However, a common denominator in rental housing is the lack of garages. During the Fairbanks winters temperatures frequently dip well below zero and cars are retrofitted with engine block heaters drawing up to 1500 W in order to start. This is referred to as 'plugging in', and many residents plug their cars in overnight when two hours in the morning would be sufficient. Data indicates 43% of Fairbanks households don't have garages. If even a quarter of those cars currently 'plugged in' overnight install timers reducing their draw from 12 hours to 2 hours a day, the savings can prove to be significant. A systematic approach to landlords, both large and small will be taken to gauge interest, support and which aspect of the program will best suit their tenants.

The Fairbanks North Star Borough and the City of North Pole have direct control over their own capital projects and will emphasize energy efficient retro-fits (the borough energy use comprises around 10% of the total energy use covered in the competition metric). In 2013, while electricity accounted for 37.1%

of energy use in borough, it counted for 59.5% of the energy budget. In recent years, the borough created a position in the public works department devoted to energy management in facilities. Energy use in municipal facilities has decreased 5% each year. Future projects include lighting controls, lighting upgrades to LEDs, and engine block heater controls for borough facilities. The City of North Pole has public facilities, including a water and sewer utility- they too will put energy efficiency projects at the forefront of capital project lists.

How will the program reach diverse aspects of the community - geographic, demographic, economic, functional, etc. ?

Previous energy savings programs have indicated that the greater number of different sources an individual hears about the program from, the greater likelihood of participation (as seen from the Energize Phoenix program). Towards that end, the Fairbanks program will reach diverse aspects of the community using three strategies – traditional print, radio and television advertising; social media (Twitter and Facebook); and targeted outreach to groups and organizations.

The program budget contains \$30,000 for media and competition prizes; in the Fairbanks advertising market, that is a meaningful budget. In addition, program funds will be directed through the non-profit North Pole Economic Development Corporation, as such, radio and television stations will provide a 1:1 match for all advertising, further spreading the dollars. Traditional advertising will target the adults without school age children audience (roughly 65% of the population). More specifically, advertising will target the 18-55 demographic, who are most likely to use smart phones and be inclined to use a program like Energy Pact. Traditional media will, to a lesser extent, provide a more general message to the entire population about the overall program and the energy competition.

The news media will also be utilized, as the competition and Fairbanks' participation in it are definitely newsworthy events. Press releases and individual follow-up to news sources are planned throughout the competition.

The program will utilize social media, creating a Facebook page and a Twitter account. Experience has shown Facebook to be a good avenue for long-term marketing, but less effective at stirring people to action. People will "like" your page, but usually take no other action. Facebook can still be a good source of information for people, so a page will be developed and regularly updated. Experience with recent large scale events in the community have found that using Twitter to post information about programs is an effective way for followers to keep in touch. Developing a Twitter account and followers will allow us to draw attention to the program, events, and progress and thus, raising awareness and creating buzz. Twitter allows us to take a direct hand in managing the buzz about the program.

Direct outreach to groups, clubs and organizations will be key to reaching our energy efficiency goal. Our staffing includes an outreach and development position to systematically approach groups of residents likely to participate. A presentation and materials will be developed for use in the outreach efforts. The specific method for approaching each of these various groups will be determined by attributes of the people within them. One important demographic for the Borough is the large Native Alaskan community. We have reached out to the regional tribal non-profit, Tanana Chiefs Conference, and they are planning to participate in the program, and may in fact have a critical role in some aspects. For seniors, the state of Alaska has senior programs that incorporate a continuously updated mailing list, which can be sorted by zip code and used to share letter-format information with individuals residing in the competition area. Other service groups, such as Lions or Elks, have monthly meetings which will be attended by one or more of our team members, to share a presentation describing the program, available resources and current status, and to and solicit support and participation.

Living in a small town is a decided advantage in outreach efforts - access to most groups will be direct and relatively easy.

How will energy retrofits and other capital improvements be included in the Program?

As shown, capital improvement opportunities with energy efficiency benefits have been identified for municipal buildings. While their implementation will, of course, be paced by availability of tax and bonding derived revenue, the high local cost of energy helps to place emphasis on modifications that will reduce overall energy expenses.

Building	Planned Energy-Related Improvement(s)
Solid Waste Landfill	<ul style="list-style-type: none"> • Lighting upgrade –switch high pressure sodium lights to LEDs
Multiple Facilities	<ul style="list-style-type: none"> • Replace building exterior lights
Landfill, Ice Rink	<ul style="list-style-type: none"> • Install occupancy sensors
Recreation Centers, Pools	<ul style="list-style-type: none"> • Install pool covers
Animal Shelter	<ul style="list-style-type: none"> • Install Direct Digital Controls
Transit Garage, Ice Arena, Maintenance Facility	<ul style="list-style-type: none"> • Install head bolt controls

Implementation of residential (whether owner-occupied, or landlord-owned) structural retrofits and improvements is largely driven by case-specific motivations and opportunities. Our program emphasizes facilitating broad awareness of local, state and federal energy efficiency improvement technical and fiscal resources, and implementing metrics / progress visibility that we believe will have strong behavioral impacts.

Retrofit financing, retrofit business resources, retrofit marketing & sales strategies and adoption goals

As noted in Section 1, the Alaska Housing Finance Corporation has programs across a wide spectrum of income and structure types for energy audits and energy improvements financing. In addition, we intend to work with our local home improvement stores (e.g., Lowe’s, Home Depot, Wall Mart, Spenard Building Supply) to offer price incentives on do-it-yourself lighting and weatherization materials early in the program.

Types of retrofits that will be encouraged

Ninety-six percent of homes in the borough are heated with methods not scored in the GUEP competition. As such, the technology and retrofits the Fairbanks program focuses on will be electrical. Efforts will focus on behavior modification and retrofits for residential units and capital improvement projects for municipal facilities that prioritize increased energy efficiencies.

The Fairbanks program has identified a number of existing technologies that have the highest potential for reduced energy consumption in residential electric accounts, including:

- 1) *Reducing use of electric space heaters used to augment oil-based heating systems.* Residents use them during the long winters to heat occupied spaces, typically employing 1500 W appliances that can use up to 65 kW hours during the course of a winter on an individual basis.
- 2) *Utilize vehicle plug-in timers.* Fairbanks winters require vehicles to be winterized, which includes installation of an engine block heater, a battery pad heater, and oil pan heater. A three way cord with a lighted end allows all of these heaters to be “plugged in” with one cord. Many residents plug their vehicles in overnight, when it really needs only about two hours of plugged in time to warm up. Plugging in the average car (1,000 W load) for ten hours each night, the monthly electric cost would be about \$60. Just two hours would run \$12 per month. Instead of waking up two hours early to plug in a car, the vehicle plug-in timer will make sure vehicles are ready to start. An estimated 43% of residences in Fairbanks and North Pole do not have garages, and therefore, would utilize plug-ins to keep their vehicles running in the wintertime.
- 3) *Switching to LED or Compact Fluorescent lighting.* Electric lighting burns up to 25% of the average home energy budget. Both LEDs and CFLs are considerably more efficient and last up to ten times longer than incandescent. Although initially more expensive, residents will save money in the long run. LED wattages can be as much as a tenth of the amount of incandescent, resulting in a tenth of the cost, not an insignificant amount with \$0.24 a kWh. Efforts will be made to encourage the use of LEDs for exterior lighting, as they are particularly well-suited for exterior lighting; they have much higher wattage than indoor lighting and LEDs perform much better than fluorescents and even incandescent in extreme cold.

The program will use its three tools – smart phone app that allows users to track potential savings and progress towards rewards, smart phone app based on the behavioral economics principle that people are more motivated by Not losing money than by simply earning money and our website that will serve as a home base and provide tools for non-smart phone users. The tools will direct residents, business and community organizations to the technologies identified as having the highest potential for energy savings. The competition and its prize will help focus the community’s attention on energy efficiency. The competition will itself be a news item; subsequent advertising and outreach efforts will reinforce the messages. Monetary rewards are known to be a prime motivator, it is anticipated that existing programs with low participation will experience increased participation levels as a result of increased attention and the tools Fairbanks develops to encourage that participation.

Adoption goals

Our goal is to reduce residential and municipal energy use by 12% by 2017.

How will the Program target high-return opportunities?

Fairbanks and North Pole have few historic buildings (we celebrated the 50th anniversary of statehood just a few years ago). We see our highest potential return opportunity as residential rentals. We will conduct targeted outreach efforts focused on both owners/landlords and renters using our tools for adults with and without school age children.

How will the community measure and evaluate the success of the Program?

Ultimately, the measure of success will be measured by the percentage reduction of energy consumption (electrical) verified by the local electric cooperative. Overall progress will be tracked through the project dashboard website. Individual project components success will be measured by tracking the number of users of both smart phone apps. The K-12 program success measures will be

evaluated by participation in school/class competitions and the reduction of energy use at student's homes.

Does the Program include long term components that won't affect energy usage during the two years of Stage 3?

In addition to tracking reductions in electric power use for residential and municipal users, we intend to conduct trials related to heating fuel energy efficiency since the cost of heat is often significantly higher than the cost of power for most users. Specifically, the University of Alaska Fairbanks has developed a prototype simple, inexpensive meter to address these related needs for consumption information. The meter can provide information regarding real-time diesel fuel oil consumption, and record consumption over time. This data may influence short-term behavior, will provide baseline information for long-term improvements such as weatherization, allow calibration of modeled energy use in dwellings to actual behavior, and provide insight into seasonal and diurnal heating needs. We hope this device could serve as a basis for allowing heating oil to be tracked and included in future iterations of the GUEP.

Section 3) Utility Data Reporting

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

One of the members of our GUEP steering committee is Vice President of Transmission & Distribution at GVEA (our electrical utility). We have a strong and proactive relationship with GVEA, who has long been a state leader in promoting and supporting energy efficiency and conservation programs.

How will the utility identify residential energy consumers in order to aggregate their energy use?

Residential energy consumers will be identified by the GVEA by address (as being part of the borough) and by billing rate class.

How have the community and the utilities identified municipal accounts in order to aggregate their energy use?

The Fairbanks North Star Borough and the City of North Pole have provided a list of municipal facilities. Please see attached list at end of application.

Section 4) Innovation

What is innovative about the Program?

The FNSB program attempts to change behavior using three innovative tools and a systematic outreach campaign that ensures their use.

The first smart phone app is designed primarily for use with the residents-with-school-age-children target audience (K-12 program). It will allow users to track potential savings associated with their energy-saving activities and tie the savings amounts into progress toward a potential reward. There are various smart phone apps that deal with energy efficiency, the Fairbanks app is innovative in that it ties

behavior to a specific reward system as the user reduces energy use. This app is ideal for communities that do not have smart meters.

The second smart phone app will be designed to take advantage of the simple behavioral economics principal that people are more motivated by not losing money than by simply earning money. ACEP is coordinating an effort to develop this app and will beta test it as part of the GUEP competition in Fairbanks. The app will have three components: 1) Commit – participants will set an energy-saving goal to be achieved within a specified time frame, and indicate what cash value they place on achieving that objective, knowing that it will be forfeited if they are unsuccessful. They will pay other participants in that goal area if they don't achieve their objective; 2) Meet the goal set, tracking progress with the app through the allocated time period, providing documentation of actions taken (e.g., digital pictures); 3) Reap the rewards by earning cash for saving energy, receiving back what was committed by the participant, plus a portion of whatever was pledged by those in the goal area who did not achieve their objective. In this manner, participants have the opportunity to receive two cash rewards – one in the realized savings from the energy efficiency or conservation measure they employed, and secondly by receiving a cash payment forfeited by those that did not meet their commitment.

The third innovative tool is a simple to install, inexpensive meter capable of providing information on real-time heating oil consumption, and recording that consumption over time. Developed by ACEP and installed by magnetically attaching it to the boiler without the need to break into fuel lines, it is believed that data provided by these meters could influence short-term behavior. Because users will have a tool that provides short-term feedback for activities such as turning down the thermostat or weatherization, they will be more likely to engage in these activities. These meters will be tested in parallel to other activities occurring through the GUEP program, and will provide baseline information for long-term improvements such as home weatherization. While we recognize any realized reduction in energy use through this mechanism will not count toward our overall goals, we hope this process could inform future iterations of the GUEP to allow communities heavily reliant on fuel oil to compete in the area reducing energy consumption for space heating.

The FNSB program's other innovation is to focus on the psychology of the 'stuck problem' by specifically engaging younger students who are less stuck by virtue of their age. Younger children have much greater mental elasticity to pick up new behaviors and skills; this diminishes as they grow older and their behaviors and personalities become more set. There have been relatively few energy efficiency programs that have focused on K-12 student competitions as agents for community energy reduction and have also attempted to measure the effect. Some notable programs, such as the Minnesota Energy Challenge or the American Home Energy Education Challenge, have included some aspects of our Program; the Fairbanks program places more emphasis on behavioral change and measurable results.

Section 5) Potential for Replication

Identify planned resources that could become a model for other communities. Identify any procedural aspects of the plan that may be particularly well-suited for replication in other communities.

The smart phone apps developed in conjunction with the Fairbanks program can easily be adapted and replicated by other communities. Some elements will be available as open source code; in other cases, there may be a nominal licensing fee for code developers, or a small app download fee for general users.

Similarly, the heat meter could be adopted by any community or individual user still reliant on heating oil for space heating applications.

The K-12 education and kilowatt competition should be particularly replicable. The source code for our main web site can be made available as freeware. The AKEnergySmart curriculum is available free-of-charge to any web user, is designed to be usable in any Alaska setting, and can be tailored for non-Alaska implementations by integrating different graphics where relevant and ensuring compliance with local state learning standards. Literature (presentations, handouts, etc.) will be made available via links from our Facebook page, as files directly usable and modifiable in common commercially available software.

Section 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?

Capital improvements to municipal, school and residential structures will, of course, yield energy savings dividends throughout the life of the buildings, and will contribute to higher resale values for the properties.

The hallmark goal of Fairbanks' program is a permanent shift in the public's perception towards energy efficiency. The aim is to instill the permanent behavior of energy efficiency awareness so that actions like turning off the light when leaving the room will still be second nature ten years and more after the contest. This approach aims to create a larger subset of the population (through behavioral change education on students) that will consistently adopt new energy efficiency technologies that are economically viable without significant future prompting. This is an inherently long term view as it will have the most effect when the students grow into adults. As the high price of electricity here in FNSB (about twice the national average) does not appear to be going down significantly any time in the future, an informed populace should continue to value energy efficiency.

Promoting energy efficiency as a public value stimulates demand for energy efficient technologies and services. Energy efficiency, by its very nature, is cost efficient in the long term and therefore affordable with the right financing, given the proper time frame. The problem has generally been public value perception of energy efficiency relative to other issues, in terms of time and money demands. Our program targets key influencer groups within the greater Fairbanks community, supplies factual information and tools that facilitate rational determination of their most relevant energy efficiency investments and disciplines, and provides them with the social and emotional motivation and support needed to implement those changes and value energy efficiency more highly.

How could aspects of the Program become institutionalized through policies and other means?

The school district could permanently adopt energy saving aspects of the curriculum if satisfied with the performance of AK Energy Smart models provided by REAP. The borough has also hired an energy management engineer as of March 2013. This represents a policy shift in the borough government to focus on energy efficiency. There are yearly energy management reports that highlight energy efficiency capital projects that the borough is currently working on, demonstrated savings of past energy efficiency projects, and proposed future capital projects with energy saving intentions.

What systems or approaches will be used to collect, manage, and exploit relevant data?

FNSB will use a website tied to a smart phone application to provide dashboard information on electrical use and cost. Currently FNSB has no smart meters and monthly utility data will have to suffice. This will be compared with estimated energy savings from energy savings pledges that residents sign up for taken off of last month's electrical use with the option of using last year's electrical bill if residents lived in the same building last year. The website will show a resident's electrical use for the previous month, along their previous year's electrical use of that month if applicable. It will also let them see what their average community use is (in a school area or even class room group) as well as how FNSB is doing compared to other GUEP communities. The focus will be on percentage change of electrical use compared with last month's and the previous year's use for that month to level out different electrical footprints (such as house size) among contestants.

Section 7) Education

How will the local K-12 system be involved?

The local K-12 school system will play an important part in the FNSB energy savings Program. Since the FNSB program will be focusing on behavioral change it must be recognized that behaviors are easier to change in youth (whose brains have greater elasticity) than in adults. Long term sustainability of energy efficiency can be ensured through influence on a new generation of more energy conscious individuals. K-12 student's effort's in their homes and their communities will figure prominently in the ultimate success of our program. The strategy focuses on the idea that community residents will be more receptive to their children or their neighbor's children than to public officials. FNSB's K-12 program is comprised of education resources, engaging presentations and an incentivized Kilowatt Drive competition.

The Alaskan Housing Finance Corporation (AHFC) and the Renewable Energy Alaska Project (REAP) offer an energy curriculum resource that aligns with state science standards called AK Energy Smart. Originally developed at ACEP, it is comprised of several grade appropriate lessons for use in the classrooms. The curriculum has been updated as state standards have changed over the years. There are currently two teacher training sessions by REAP scheduled for this year. Teachers will have access to resources, lesson plans and other information to educate students on energy efficiency.

The school district will set up energy efficiency presentations across schools with Energy Hog (a program set up by the Alliance to Save Energy). This component involves assembly presentations on energy efficiency, with follow-up lessons and energy saving games. Additionally, it is planned to have university and high school students volunteer as 'Energy Ambassadors' to the middle and elementary schools. These will be energy conscious, civic-minded students who will work with their science teachers and/or school clubs to put together energy efficiency presentations for younger students. Whether this works through an afterschool voluntary club or as a class assignment will be the choice of each school. Having engaging presentations by older students and other leaders from outside the school, such as the Energy Hog and Energy Ambassadors should increase the likelihood of students buying into the program ideals and adopting behavioral change.

The goal of both the education resources and engaging presentations is to make the students aware of energy efficiency issues and methods to reduce energy usage. Awareness is the foundation on which we

will build out program to impact energy consumption. The anticipated outcomes of actual reduction of the community's energy use (as measured in the GUEP competition), will be achieved through the school district's Kilowatt Drive competition. All of the educational activities and presentations will serve as a lead up to and maintenance of the competition. Following Caidini's 2001 San Diego 'door hanger study' it has been noted that people seem more likely to adopt energy saving behaviors if they think their neighbors (and community members) are already doing them. This result is a combination of the psychological effects of peer-pressure and joining the band-wagon.

It is predicted that students will be more engaged in a competition that involves energy efficiency (similar to existing popular canned food drives) than they would be from just receiving the information on ways to save energy. After a sustained period of discussing energy efficiency and competing with their school peers, cognitive dissonance predicts that even those student originally opposed to the idea will become more favorable towards it.

To increase participation and effectiveness, the competition will involve various energy tracking methods, dashboard websites and Smartphone applications, and an incentive system. As FNSB lacks smart meters for our utilities, the tracking of effect will include real time estimates based on self-reporting, along with monthly 'reality checks' where estimated energy use is compared with actual energy uses as recorded by the students' utility provider. There will be a website for the students' utility data and self-reported energy savings. As this will involve personal customer information, each student's account on this web site will be password protected. This website will be put together and serviced as part of a high level UAF computer science class project.

The K-12 competition will compare energy use from the first month of the semester to the last month of the semester. Since the competition will be comparing the percentage change between schools, the winners will be selected based on the most positive percentage change each semester. This will give four comparable semester competitions within the GUEP time frame. It will also provide teachable about seasonal differences and impacts on energy use.

Initially the competing K-12 groups will be based on school attendance areas, which will allow for relatively easy data flagging by the electric utility. Students will compete based on their school attendance. The competition web site will let students know what area they fall under (this accounts for private schools, charter schools, home school students and students who live outside the designated area of the school they attend). As the website is further developed, it will allow for students to form their own groups within their school areas, allowing for classroom vs. classroom competition. The more personalized and interactive the competition is, the more likely that participants will be more competitive which will lead to greater energy savings in the community. The website will be improved and adjusted between each semester competition. This will hopefully yield increasing energy savings as time goes on and provide valuable information for other communities seeking to emulate this procedure.

Students will be asked (but not required) at the start of the competition to sign a 'Pledge to reduce energy use' form, as a person that makes public commitment to pursue a specific course of action is more like carry through with it than if they just tell someone they will do it or don't make any outward commitment at all. Furthermore, students will be encouraged to participate in specified energy challenges that will have an estimated energy savings based on factors the students input. The challenges can be selected from the website created for the competition, accessible on computers and smart phones. Information will be provided on the website about ways to fulfill each pledge. The website will involve an energy calculator so that students can estimate how much energy their actions will save. The students will make a baseline estimation of how their home energy use breaks down. The

estimated reduction of energy use resulting from pledges will be divided by the total electrical use at the start of the competition to give a percent reduction. That percent reduction will be able to be compared to the average percent reduction of the students' school area and other school areas average.

The Kilowatt Drive reward system will evolve as the program does. The initial reward will be for the whole schools with the greatest average percent reduction in energy use. The incentive system will be designed to allow competition for an "Energy Champion" trophy with elementary schools competing among themselves and secondary schools competing among themselves. As the website develops, capacity will be built to allow for smaller groups to compete, and to challenge on another; one school's hockey team might challenge another school's football team, or a middle school choir might challenge a high school choir. The monetary value of the rewards will depend on the results of fund-raising efforts (conducted in combination with awareness and recruiting efforts for the general FNSB GUEP program) It is expected that the K-12 schools will compete for iPad carts donated to the winning school. Pizza parties will be the standard reward for top scoring smaller groups (such as classrooms) and cash prizes to be used for student travel for organized school activities will be set up as well.

What community-wide educational programs are planned?

As part of its program, Fairbanks will direct residents to existing programs for energy retrofits, energy saving ideas and other information sources for energy efficiency ideas. More attention will be made to marketing efforts to educate residents and businesses about the GUEP competition, its components and how to participate. Messages will emphasize the energy efficient technologies and behaviors as mentioned in the technology subsection of section 2.

Section 8) Prize Purse

Briefly describe preliminary ideas for how a prize purse 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.

FNSB would use the \$5 million prize to promote and implement continued energy efficiency measures that benefit the Fairbanks community as a whole, and extend the Fairbanks program benefits to other communities. Current estimates for the prize money allocation are as follows:

- 20% to fund design for non-profit energy efficiency upgrades. Funding is generally available for retrofits (through grants or loans) but having design done to the level required to accurately estimate construction costs is often a barrier to non-profits. The funds will supplement an existing program, The Fairbanks Non Profit Retrofit Program, that has loans available for nonprofits but does not have sufficient funds to underwrite design costs.
- 20% would go towards weatherization for low-income housing that is not otherwise covered by AHFC's Weatherization Assistance Program. Efforts would be coordinated with AHFC program personnel.
- 20% to establish a fund for the Fairbanks North Star Borough School District for energy efficiency retrofit projects in the schools. Currently, capital improvements for schools are funded through a long process that involves the state legislature and the borough appropriating capital dollars. This fund would allow quicker access to capital for energy efficiency projects. .

- 10% to fund outreach and marketing efforts to extend the successful Fairbanks program to military and the University of Alaska target groups not covered in the GUEP energy prize competition.
- 10% allocated as cash prizes for future energy efficiency efforts or competitions in the community. Fairbanks success with the GUEP energy prize will demonstrate that cash incentives do motivate behavior; a fund will be set up to continue that tradition.
- 10% to establish an energy efficiency endowment that allows K-12 teachers to apply every year for funds to be spent on educational material, such as computer programs or solar panel experiments, focused on energy efficiency. It could also be used for travel fare by students competing in national competitions for energy efficiency or other related science projects.
- 10% to analyze gaps in the FNSB's program to make it more replicable and increase success rates of future energy efficiency programs in Alaska and similar regions. This money would be used to identify energy uses that were not successfully reached or were overlooked by the program, as well as devise specific marketing strategies for reaching them in the future. The money would also better allow for identification of highest impact strategies in our program that can be translated to other communities.

If Fairbanks wins the Georgetown University Energy Prize, program steering committee members will work to secure business and foundation funds that supplement the prize money. Additional funds raised through these efforts will be used to address the core areas identified above.

Appendix

FNSB Municipal Buildings List	Section A
Examples of Energy Efficiency Web Mapping Application	Section B
Energy Data Collection Information	Section C
Letters of Support	Section D

FNSB Municipal Buildings List

School Facilities

FNSB Borough	
ANDERSON ELEMENTARY SCHOOL	NORDALE ELEMENTARY SCHOOL
ANN HOPKINS WIEN ELEMENTARY SCHOOL	NORTH POLE ELEMENTARY SCHOOL
ARCTIC LIGHT ELEMENTARY SCHOOL	NORTH POLE HIGH SCHOOL
BADGER ELEMENTARY SCHOOL	NORTH POLE MIDDLE SCHOOL (6th - 8th)
BARNETTE ELEMENTARY SCHOOL	PEARL CREEK ELEMENTARY SCHOOL
BEN EIELSON Jr / Sr HIGH SCHOOL	RANDY SMITH MIDDLE SCHOOL
CRAWFORD ELEMENTARY SCHOOL	RYAN MIDDLE SCHOOL
DENALI ELEMENTARY SCHOOL	SALCHA ELEMENTARY SCHOOL
EFFIE KOKRINE CHARTER SCHOOL (Howard Luke)	SCHOOL DISTRICT CENTRAL KITCHEN
FIFTH AVENUE BUILDING	SCHOOL DISTRICT PHYSICAL PLANT/WAREHOUSE I
HERING AUDITORIUM	TANANA MIDDLE SCHOOL
HUNTER ELEMENTARY SCHOOL	TICASUK BROWN ELEMENTARY SCHOOL
HUTCHISON HIGH SCHOOL	TWO RIVERS ELEMENTARY SCHOOL / 7th & 8th
JOY ELEMENTARY SCHOOL	UNIVERSITY PARK ELEMENTARY SCHOOL
LADD ELEMENTARY SCHOOL	WELLER ELEMENTARY SCHOOL
LATHROP HIGH SCHOOL	WEST VALLEY HIGH SCHOOL
WOODRIVER ELEMENTARY SCHOOL	

Borough Facilities

ANIMAL SHELTER	BOROUGH ADMINISTRATIVE OFFICE BUILDING
BIG DIPPER ICE ARENA	BOROUGH WIDE UNDERGROUND STORAGE TANKS UPGRADES
BIG DIPPER STORAGE GARAGE	CHENA LAKES REC. AREA CHANGE HOUSE/RESTROOMS
BIRCH HILL GARAGE	CHENA LAKES REC. AREA - GENERAL
BIRCH HILL SKI BLDG	NORTH POLE LIBRARY

BIRCH HILL TIMING BLDG	NORTH POLE SOLID WASTE TRANSFER STATION
BIRCH HILL WARM UP BLDG	NORTH STAR TRAINING CENTER (Adler School)
CHENA LAKES REC. AREA MAINTENANCE HOUSE	PARKS & RECREATION FIELDS, PLAYGROUNDS & MISC
CHENA LAKES REC. AREA RESCUE BOAT HOUSE	PIONEER PARK CABIN #01 (Pioneer Hall)
RURAL SERVICES (in 5th Avenue Bldg)	PIONEER PARK CENTINIAL CENTER
GROWDEN PARK	PIONEER PARK GOLD DOME
HAMME SWIMMING POOL	PIONEER PARK GROUNDS
JOHN CARLSON COMMUNITY ACTIVITY CENTER	PIONEER PARK PALACE SALOON/SQUARE DANCE HALL
MARIKA ST. RED STORAGE BARN	PIONEER PARK UNINSURED CABINS & OTHER BUILDINGS
MARIKA ST. SHOP/WAREHOUSE	PIONEER PARK/RIVERBOAT NENANA
MARY SIAH RECREATION CENTER	RAILROAD MUSEUM / PIONEER PARK
NOEL WIEN LIBRARY	PIONEER PARK CENTINIAL CENTER
EMERG. MGT.(Old DATA PROC CTR)	PIONEER PARK GOLD DOME
SOLID WASTE LANDFILL BLDG	PIONEER PARK GROUNDS
SOLID WASTE LANDFILL HEAVY EQUIPMENT GARAGE	PIONEER PARK PALACE SALOON/SQUARE DANCE HALL
SOLID WASTE LANDFILL HHW	WESCOTT SWIMMING POOL
TANANA RIVER LEVEE	PIONEER PARK/RIVERBOAT NENANA
TRANSIT GARAGE (M.A.C.S.)	RAILROAD MUSEUM / PIONEER PARK
TRANSIT PARK/DOWNTOWN TERMINAL (M.A.C.S.)	SOLID WASTE LANDFILL BLDG
PIONEER PARK UNINSURED CABINS & OTHER BUILDINGS	TRANSIT GARAGE (M.A.C.S.)
EMERG. MGT.(Old DATA PROC CTR)	TRANSIT PARK/DOWNTOWN TERMINAL (M.A.C.S.)
SOLID WASTE LANDFILL HEAVY EQUIPMENT GARAGE	WESCOTT SWIMMING POOL

SOLID WASTE LANDFILL HHW	TANANA RIVER LEVEE
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Fire Stations

CHENA GOLDSTREAM VFD STATION NO. 4 (Rosie Creek)	NORTH STAR VFD STATION NO. 5
CHENA GOLDSTREAM VFD#1 (Chena Ridge)	STEESE VFD STATION NO. 1 /EOPS (Farmers Loop)
CHENA GOLDSTREAM VFD STATION NO. 2 (Murphy Dome)	STEESE VFD STATION NO. 2 (Steele Creek)
ESTER VFD STATION	STEESE VFD STATION NO. 2 COLD STORAGE
NORTH STAR VFD STATION NO. 1	STEESE VFD STATION NO. 3 (Old Fox Elem)
NORTH STAR VFD STATION NO. 2	STEESE VFD STATION NO. 3 DORM UNIT
NORTH STAR VFD STATION NO. 3	UNIVERSITY FIRE STATION #1 (Campus)
NORTH STAR VFD STATION NO. 4	UNIVERSITY FIRE STATION #2 (University Avenue)

City of North Pole

Facilities

CITY HALL	EIGHTH AVENUE FIRE WELL
POLICE STATION	PUBLIC WORKS BUILDING
WATER TREATMENT PLANT	NORTH POLE FIRE STATION ANNEX
SENIOR CENTER	HIGHWAY PARK PUMP STATION
WASTERWATER TREATMENT PLANT	

Example of the energy efficiency web mapping application.



Example of entering a point in a web mapping application.

The screenshot displays a web mapping application interface. At the top, the title reads "Fairbanks North Star Borough Energy Efficiency Tracking" next to a logo. The main area is an aerial map of a residential neighborhood with numerous yellow house numbers overlaid. A red pin is placed on a specific house. On the right side, a modal window titled "HIGH_WATER_REPORTS" is open, containing a form with the following fields: DESCRIPTION, PROBLEM DATE(s), FIRST NAME, LAST NAME, STREET ADDRESS, PHONE, and EMAIL. Below these fields is an "Attachments:" section with a "None" option and a "Browse..." button. At the bottom of the form, it says "Edited by tomducancan_FNSB seconds ago" and a "Delete" button. On the left side of the map, there are navigation controls including a zoom in (+) and zoom out (-) button, a home button, and a refresh button.

Example of an information dashboard that can be part of the web platform home base.





ENERGY DATA COLLECTION INFORMATION

The following form is an adaptation of the optional attachment many communities submitted along with their Application utility commitment letters. The purpose of this form during the Quarterfinals (August – November 2014) is to gather data that will help communities, utilities and the Georgetown University Energy Prize (GUEP) team to standardize data collection procedures for all competing communities prior to the January 2015 start of data collection.

Community Name: Fairbanks North Star Borough

Utility Name: Fairbanks Natural Gas

Utility Type (check one):

- Investor Owned
- Municipally Owned
- Co-op

Energy Type (check all that apply):

- Gas
- Electricity

The community and utility understand that, during the two-year energy competition (Semifinals), the utility must report at least quarterly to GUEP the total (aggregate) monthly energy directly supplied to all of their residential and municipal customers.

Aggregate data will be reported separately for the residential and municipal sectors. A given month's aggregate energy use is defined as the total of the energy billed during that month.

The quarterly reports are due within 45 days of the quarter's end. When submitting the first quarterly report, the utility must also report the community's baseline energy use: the monthly aggregate residential and monthly aggregate municipal energy supplied during the 24 months prior to the start of the Semifinals.



ENERGY DATA COLLECTION INFORMATION

1 Identifying Contributors to the Residential and Municipal Aggregate Energy Usage

1.1 Identifying Accounts or Addresses within the Municipality

Utility is be able to identify properties served in the municipality, with at least 95% accuracy, by these methods [*check all that could be used*]:

<input checked="" type="checkbox"/>	Identify by selecting for municipality name in service addresses
<input type="checkbox"/>	Identify by Zip Codes
<input type="checkbox"/>	Identify by Tax Districts
<input type="checkbox"/>	Other Identification Method(s) – [<i>please describe</i>]

Comments: [*insert any comments, e.g., about concerns regarding difficulty or reliability*]

1.2 Identifying Residential Accounts or Addresses

Given the properties selected via 1.1 (above), Utility will be able identify residential properties by these methods [*check all that could be used*]:

<input checked="" type="checkbox"/>	Identify by billing rate class
<input type="checkbox"/>	Identify by other database field [<i>please describe</i>]
<input type="checkbox"/>	Other identification method(s) – [<i>please describe</i>]



ENERGY DATA COLLECTION INFORMATION

Will all energy consumption by multi-unit residential apartment buildings or complexes be included?

<input checked="" type="checkbox"/>	Yes (all energy consumption will be included)
<input type="checkbox"/>	No – <i>[please describe any problems, estimate the significance, and propose a solution]</i>

Additional Comments: *[insert any other comments, e.g., about concerns regarding difficulty or reliability]*



ENERGY DATA COLLECTION INFORMATION

1.3 Identifying Municipal Accounts or Addresses

Given the GUEP's definition of municipal energy use, as described in the Competition Guidelines (guep.georgetown.edu/rules-timeline), Utility will be able to identify all contributors to the municipal energy use by these methods [*check all that could be used*]:

<input type="checkbox"/>	Identify by enumeration of relevant accounts, given that the community provides a reliable list of contributors
<input type="checkbox"/>	Identify by enumeration of relevant service agreements (SAIDs), given that the community provides a reliable list of contributors
<input type="checkbox"/>	Identify by enumeration of relevant service addresses, given that the community provides a reliable list of contributors
<input type="checkbox"/>	Identify by enumeration of relevant meters given that the community provides a reliable list of contributors
<input checked="" type="checkbox"/>	Identify by billing rate class
<input type="checkbox"/>	Other identification method(s) – [please <i>describe</i>]



ENERGY DATA COLLECTION INFORMATION

2 Computing Aggregate Energy Usage

Utility will need to report to GUEP the aggregate residential and (separately) the aggregate municipal energy uses, as well as the number of contributors to the aggregates. Given the residential and municipal property identification methods discussed above in 1.0, Utility would be able to compute the aggregates based on information from *[check all that could be used]*:

<input checked="" type="checkbox"/>	Energy use meters
<input checked="" type="checkbox"/>	Energy use bills
<input type="checkbox"/>	Energy use accounts
<input type="checkbox"/>	Energy use service agreements (SAIDs)
	Other Identification Method(s) – <i>[please describe]</i>

Comments: *[insert any comments, e.g., about concerns regarding difficulty or reliability]*



ENERGY DATA COLLECTION INFORMATION

3 Special Circumstances

This section addresses circumstances that may complicate energy data collection in some communities.

3.1 Fuel Switching Programs

Is there likely to be a significant amount of “fuel switching” during the competition – i.e., switching from fuel oil or propane to gas or electricity?

<input type="checkbox"/>	No
<input checked="" type="checkbox"/>	<p>Yes – <i>[please describe and estimate the extent of likely fuel switching]</i></p> <p>Four schools will be converted from heating to natural gas during the competition. Combined heating oil usage for the four schools last year was 9238 MBTUs. Other municipal facilities may be converted depending on available funding and an increased supply of natural gas to the community.</p>

Will the fuel-switching coincide with the installation of new gas or electric service or meter?

<input checked="" type="checkbox"/>	No (There won't be any new service lines or newly installed meters – additional gas or electric energy will be delivered via an existing service)
<input checked="" type="checkbox"/>	Yes – (New gas or electric service with new metering will be installed)

Comments: *[insert any comments, e.g., about concerns regarding difficulty or reliability]*



ENERGY DATA COLLECTION INFORMATION

3.2 Renewable Energy Installations

Are there likely to be significant installations of renewable energy sources during the competition (e.g., residential rooftop solar panels)?

<input checked="" type="checkbox"/>	No
<input type="checkbox"/>	Yes – <i>[please describe and estimate the likely extent]</i>

Will the installed renewable energy sources reduce the amount of gas or electricity that is delivered to residential and municipal accounts by utilities? For example, residential rooftop solar panels typically reduce the amount of utility-delivered electricity, but a community field of solar panels might be handled differently.

<input type="checkbox"/>	Yes (consumption from utilities will be reduced)
<input type="checkbox"/>	No – <i>[please explain]</i>



ENERGY DATA COLLECTION INFORMATION

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Community Name: Fairbanks North Star Borough

Utility Name: Golden Valley Electric Association

Utility Type (check one):

- Investor Owned
- Municipally Owned
- Co-op

Energy Type (check all that apply):

- Gas
- Electricity

The community and utility understand that, during the two-year energy competition (Semifinals), the utility must report at least quarterly to GUEP the total (aggregate) monthly energy directly supplied to all of their residential and municipal customers.

Aggregate data will be reported separately for the residential and municipal sectors. A given month's aggregate energy use is defined as the total of the energy billed during that month.

The quarterly reports are due within 45 days of the quarter's end. When submitting the first quarterly report, the utility must also report the community's baseline energy use: the monthly aggregate residential and monthly aggregate municipal energy supplied during the 24 months prior to the start of the Semifinals.



ENERGY DATA COLLECTION INFORMATION

1 Identifying Contributors to the Residential and Municipal Aggregate Energy Usage

1.1 Identifying Accounts or Addresses within the Municipality

Utility is be able to identify properties served in the municipality, with at least 95% accuracy, by these methods [*check all that could be used*]:

<input checked="" type="checkbox"/>	Identify by selecting for municipality name in service addresses
<input type="checkbox"/>	Identify by Zip Codes
<input type="checkbox"/>	Identify by Tax Districts
<input type="checkbox"/>	Other Identification Method(s) – [<i>please describe</i>]

Comments: [*insert any comments, e.g., about concerns regarding difficulty or reliability*]

1.2 Identifying Residential Accounts or Addresses

Given the properties selected via 1.1 (above), Utility will be able identify residential properties by these methods [*check all that could be used*]:

<input checked="" type="checkbox"/>	Identify by billing rate class
<input type="checkbox"/>	Identify by other database field [<i>please describe</i>]
<input type="checkbox"/>	Other identification method(s) – [<i>please describe</i>]



ENERGY DATA COLLECTION INFORMATION

Will all energy consumption by multi-unit residential apartment buildings or complexes be included?

<input checked="" type="checkbox"/>	Yes (all energy consumption will be included)
<input type="checkbox"/>	No – <i>[please describe any problems, estimate the significance, and propose a solution]</i>

Additional Comments: *[insert any other comments, e.g., about concerns regarding difficulty or reliability]*



ENERGY DATA COLLECTION INFORMATION

1.3 Identifying Municipal Accounts or Addresses

Given the GUEP's definition of municipal energy use, as described in the Competition Guidelines (guep.georgetown.edu/rules-timeline), Utility will be able to identify all contributors to the municipal energy use by these methods [*check all that could be used*]:

<input checked="" type="checkbox"/>	Identify by enumeration of relevant accounts, given that the community provides a reliable list of contributors
<input type="checkbox"/>	Identify by enumeration of relevant service agreements (SAIDs), given that the community provides a reliable list of contributors
<input checked="" type="checkbox"/>	Identify by enumeration of relevant service addresses, given that the community provides a reliable list of contributors
<input checked="" type="checkbox"/>	Identify by enumeration of relevant meters given that the community provides a reliable list of contributors
<input type="checkbox"/>	Identify by billing rate class
<input type="checkbox"/>	Other identification method(s) – [please <i>describe</i>]



ENERGY DATA COLLECTION INFORMATION

2 Computing Aggregate Energy Usage

Utility will need to report to GUEP the aggregate residential and (separately) the aggregate municipal energy uses, as well as the number of contributors to the aggregates. Given the residential and municipal property identification methods discussed above in 1.0, Utility would be able to compute the aggregates based on information from [*check all that could be used*]:

<input checked="" type="checkbox"/>	Energy use meters
<input checked="" type="checkbox"/>	Energy use bills
<input checked="" type="checkbox"/>	Energy use accounts
<input type="checkbox"/>	Energy use service agreements (SAIDs)
	Other Identification Method(s) – [<i>please describe</i>]

Comments: [*insert any comments, e.g., about concerns regarding difficulty or reliability*]



ENERGY DATA COLLECTION INFORMATION

3 Special Circumstances

This section addresses circumstances that may complicate energy data collection in some communities.

3.1 Fuel Switching Programs

Is there likely to be a significant amount of “fuel switching” during the competition – i.e., switching from fuel oil or propane to gas or electricity?

<input checked="" type="checkbox"/>	No
<input type="checkbox"/>	Yes – <i>[please describe and estimate the extent of likely fuel switching]</i>

Will the fuel-switching coincide with the installation of new gas or electric service or meter?

<input checked="" type="checkbox"/>	No (There won't be any new service lines or newly installed meters – additional gas or electric energy will be delivered via an existing service)
<input type="checkbox"/>	Yes – (New gas or electric service with new metering will be installed)

Comments: *[insert any comments, e.g., about concerns regarding difficulty or reliability]*



ENERGY DATA COLLECTION INFORMATION

3.2 Renewable Energy Installations

Are there likely to be significant installations of renewable energy sources during the competition (e.g., residential rooftop solar panels)?

<input checked="" type="checkbox"/>	No
<input type="checkbox"/>	Yes – <i>[please describe and estimate the likely extent]</i>

Will the installed renewable energy sources reduce the amount of gas or electricity that is delivered to residential and municipal accounts by utilities? For example, residential rooftop solar panels typically reduce the amount of utility-delivered electricity, but a community field of solar panels might be handled differently.

<input type="checkbox"/>	Yes (consumption from utilities will be reduced)
<input type="checkbox"/>	No – <i>[please explain]</i>



5 November 2014

Fairbanks North Star Borough
Attn: GUEP Steering Committee

Subject: Georgetown University Energy Prize (GUEP) Competition

I am writing on behalf of Renewable Energy Alaska Project (REAP) to support the Fairbanks North Star Borough in its pursuit of the Georgetown University Energy Prize.

REAP is a statewide, non-profit coalition of 77 businesses, electric utilities, Alaska Native corporations, and NGOs that share the mission of increasing the development of renewable energy and promoting energy efficiency in Alaska through education, collaboration, training and advocacy. Since 2004, REAP's efforts have helped create several new state clean energy programs and goals, and the legislature has appropriated over \$870 million for those programs since 2008. Alaska's leaders understand that the state's consumers cannot continue to pay some of the highest energy costs in the nation. Fairbanks and the Interior non-residential buildings have some of the highest energy intensity (by square foot) in the state. Heating and lighting buildings across Alaska is taking an increasing number of dollars out of communities that would otherwise keep local economies strong.

REAP is committed to widespread implementation of energy efficiency measures across the state, and looks forward to collaborating with the Fairbanks North Star Borough and learning from their experiences. We hope this leads to ongoing interest in the REAP and ACEP-developed energy efficiency curriculum called *AK EnergySmart*. REAP has provided professional development trainings to the North Star Borough School District on this curriculum in both 2012 and 2014.

REAP's energy efficiency work as part of the Sustainable Southeast Partnership in SE Alaska is also strongly aligned with the Borough's proposal. REAP's energy efficiency director Shaina Kilcoyne is leading that effort, and will be in ongoing communication with the Borough regarding potential synergies. Together, our respective efforts will address energy efficiency opportunities and challenges across a variety of climates and demographics in Alaska.

As observed by the GUEP competition organizers, energy efficiency is truly a "stuck" problem. The innovation and implementation techniques the Borough team refines in the Fairbanks area will create important benefits well beyond Fairbanks. REAP is excited about the initiative the Borough is taking on behalf of the many residents of Alaska. With energy costs in the top 5% of the nation, it is vital that Alaskans collectively find the path forward toward to effective, efficient and responsible stewardship of our energy resources.

REAP respectfully requests the Committee to support the Borough's application. If you have any questions, please contact me. Thank you very much for your consideration.

Sincerely,

Chris Rose
Executive Director
Renewable Energy Alaska Project (REAP)



Headquarters
4300 Boniface Parkway
Anchorage, Alaska
907-338-6100

Mailing Address
P.O. Box 101020
Anchorage, AK 99510-1020

5 November 2014

Fairbanks North Star Borough
Attn: GUEP Steering Committee

Subject: Georgetown University Energy Prize (GUEP) Competition

I have appreciated the opportunity to interact with members of your team as you develop your energy plan for pursuing the Georgetown University Energy Prize.

You may find the Alaska Retrofit Information System (ARIS) database developed and maintained by the Alaska Housing Finance Corporation (AHFC) to be useful. This data set contains records of energy audits for over 80,000 residential addresses, 500 non-residential facilities, and energy use information on over 2300 public facilities

Data gathered from new energy audits, building retrofits, etc. can be added to this online archive, enriching the information available to Alaskans living outside of the competition area boundaries.

AHFC's network of energy inspectors and variety of loan and rebate programs for energy efficiency improvements are resources upon which both municipal building managers and private citizens can draw. Our office is available to support community presentations and provide supporting literature regarding these services. The combination of long-term, energy efficiency improvements, and behavioral changes will figure significantly in the development of energy savings that are sustainable and cost effective.

Based on my experience with the success of these programs since 1993, I believe there will be widespread applicability for the tools and techniques you implement, and the lessons learned along the way, not simply across our own state, but also in many other communities in the United States that are seeking to reduce their energy footprint.

I look forward to continuing our participation in your efforts.

Sincerely,

A handwritten signature in black ink, appearing to read "R. Scott Waterman".



R. Scott Waterman, CEA
State Energy Program Manager

P.O. Box 101020 | Anchorage, Alaska 99510
Direct: 907-330-8195 | Fax: 907-338-1747

November 7, 2014

Fairbanks North Star Borough
Attn: GUEP Steering Committee

Subject: Georgetown University Energy Prize (GUEP) Competition

Congratulations to the Fairbanks North Star Borough for being selected as a quarterfinalist for the \$5 million Georgetown University Energy Prize. Through the Alaska Energy Authority (AEA), the State of Alaska is pleased to offer the full benefit and support of its energy efficiency programs to assist with this important Fairbanks energy effort.

AEA is currently working with the Fairbanks North Star Borough, the local gas utilities, local lenders and other state entities on The Interior Energy Project, in an effort to bring greater access to natural gas to the Fairbanks and North Pole area. This effort will encourage homeowners to switch from fuel oil to natural gas for residential use.

Homeowners can take advantage of the existing Alaska Housing Finance Corporation (AHFC) Home Energy Efficiency Rebate Program to assist with the conversion to natural gas and there is potential for future on-bill financing.

AHFC has indicated that home conversion from fuel oil to natural gas will result in a 15 percent increase in efficiency due to more efficient natural gas appliances. The appliance conversion alone will qualify many for an AHFC rebate. As this work is being done, homeowners will be encouraged to make additional efficiency upgrades that will qualify them for an increased rebate up to the maximum of ten thousand dollars.

AEA is also evaluating statutory language that would enable local governments to provide commercial building owners additional energy efficiency financing options through a Property Assessed Clean Energy (PACE) mechanism. This process would allow commercial building owners to convert to natural gas and make other energy efficiency improvements. Success on this front would provide an important energy efficiency incentive to help insure the success of the Interior Energy Project. The PACE mechanism would be available through local ordinances across Alaska.

Engaging households via local schools and larger employers in the Borough is an additional approach to encourage residential energy efficiency improvements. To assist this area, AEA stands ready to support use of the AKEnergySmart curriculum materials and will provide additional programs and materials. AEA encourages the Fairbanks community to make broad use of the many resources available online at AkEnergyEfficiency.org.

Fairbanks North Star Borough
November 7, 2014
Page 2

We welcome your suggestion to provide regular updates at the quarterly Alaska Energy Efficiency Partnership meetings and look forward to learning from your successes (and challenges) as a vital part of the replication and adaptation process. The Borough is also encouraged to continue to coordinate with Cady Lister at AEA to build on and leverage various energy efficiency campaigns.

Your work with capturing and localizing energy consumption metrics will be a valuable contribution for other areas of Alaska seeking to reduce their energy use. The lessons learned during the next few years as the Fairbanks North Star Borough undergoes intense efforts to encourage conversion to a lower cost, cleaner burning fuel source coupled with greater energy efficiency measures will provide a model for other communities to consider and replicate.

My sincerest wishes for success in this endeavor. I look forward to continuing our participation in your efforts.

Sincerely,



Sara Fisher-Goad
Executive Director