Conservation & Efficiency Workgroup of the Energy Task Force

Conservation and Efficiency Workgroup: Chair: Rich Seifert. **Members:** Mike Musick, Becky Warren, Lori Hanemann, Karl Monetti, David van den Berg, Ryan Colgan.

Conservation & Efficiency Workgroup Proposal
Consider the immediate formation of an efficiency business that will identify and support the most productive means to reduce energy usage in homes in Interior Alaska. The business would provide home evaluations, identify the best energy saving alternative, provide funding options for the retrofit and document the savings to the homeowner. Utilize local workforce to provide the energy evaluation,

As a longer-term strategy, develop an applied science Energy Efficiency Education program in the local school districts. The program would start at the lower grades with basic concepts and continue through high school. Qualified high school students could work as energy raters as summer employment. It is likely that each student will at some time in their life either build or buy a home. The understanding of energy usage and efficiency will allow them to make an educated informed decision.

Discussion
Conservation and efficiency increases are by far the most effective means of reducing cost to the individual, reducing emissions and reducing fuel usage. The beauty of increasing efficiency is we can start today. With available know-how one can immediately start to save money on our utility and home heating bills. There are a multitude of simple measures that range in price and energy savings. Education is key to producing these energy savings, so the casual implementer will know what measure will provide the best bang for their buck. Efficiencies can happen at all levels, from installing compact fluorescent light bulbs to installing the most efficient combined cycle gas turbine. After the future need has been reduced through demand-side conservation or efficiency increases , the most significant savings can come from the reduced need for future supply side increases,not having to install the energy source at all, which saves all capital costs, operation and maintenance costs and fuel costs. As cost effective as conservation and efficiency efforts that reduce the need for supply-side increases are, they cannot make up the total energy solution, but are rather one key piece of the energy solution puzzle. Once again, the advantage of conservation and efficiency increases are that they can start immediately, with focused training and substantial initiative.

No matter what type of energy is used, its cost to consumers is a function of its unit of energy times the price per unit. When energy is expensive the user has limited choices; pay the high price, switch to a lower cost energy source or reduce energy costs by using less energy. The cheapest unit of energy is the one not used.

For most families, their home is their primary investment and a prime determinant of quality of life. Public policy and financial practices should reward investment in homes (including rental properties) that minimize energy usage.

The overwhelming strength of conservation and efficiency is that the technology and know-how currently exists to immediately save mostFairbanksan money on their utility and home heating bills. Yet these measures are underutilized. Demand for conservation and efficiency measures in new and existing buildings has lagged; supply of conservation and efficiency incentives exist but appear neither coordinated nor attractive. Despite numerous programs [1], most commercial and residential buildings are grossly inefficient. There are at least two preconditions to making the build environment more efficient: a high cost of energy, and both sticks and carrots to encourage demand for conservation/efficiency measures.
There are many areas, which could be developed to encourage the wise and efficient use of energy in businesses and homes. We recommend each be evaluated to ascertain how they can be deployed to provide a world leadership culture of smart energy use in Interior Alaska.

Lenders: Enable more Borough residents to qualify for energy efficiency/conservation upgrades or retrofit grants and low interest loans. (As an example of a simple upgrade, it is estimated that replacing an older low efficiency boiler with a high efficiency boiler could save a Fairbanks resident or homeowner 500 gallons a year for a net savings of approximately $1050/year.)

1. Increase funding for Low Income Weatherization program. In 2007, Interior Weatherization aims to serve127 households, or four-tenths of one percent of the Borough's 29,777 households. http://www.fedstats.gov/qf/states/02/02090.html
2. Extend AHFC's Energy Efficiency Interest Rate Reduction package to Borough residents, increase the allowable loan, and make available more funds for the program.
3. Extend AHFC'S Small Building Material Loan to Fairbanks residents, extend these loans to non-owner occupied buildings, and increase loan limits.
4. Establish loan program to encourage renewable energy installations in households and businesses (AHFC or other).

Lenders and Appraisers: Educate lenders and appraisers of the value that efficiency/conservation measures add to new or retrofitted homes and commercial buildings, especially as these measures relate to the operating costs of building, which relate in turn to a borrower's ability to repay the debt.

Borough: The Borough should encourage energy retrofits by not including the improvements in the tax assessment. Also, because conservation programs and awareness are having a positive effect on consumer choices of home lighting, the Borough needs to take used compact fluorescent bulbs as part of their hazardous waste disposal program.

GVEA: Consider utility rate structures that promote energy conservation. Continue to promote the SNAP program.

CCHRC: Fulfill their BEEEP plan, which is attached to this committee report.

Hutchison Career Center: Via the 'Alaska Works' program and other statewide vocational curriculum create a workforce trained in conservation and efficiency building practices.

The proposal will have the effect on the following 'looming issues.'
Reduce the cost of energy for Interior residents - No matter what type of energy is used, its cost to consumers is a function of its unit of energy times the price per unit. The easiest variable to control is personal energy use rates. Using less energy – at any price, but especially at present prices – necessarily reduces the cost to Interior residents.

Aging Generation - Conservation and efficiency do not by themselves obviate the need to replace increments of aging generating capacity. Distributed generation – as through the SNAP program – adds increments of new generation capacity. The cheapest kilowatt is the kilowatt you don't need to replace.

PM 2.5 Standards – Lowered use of fuels from any source, and fossil fuels in particular, will result in lower emissions overall. Conservation and efficiency may have a positive effect on Fairbanks' ability to meet PM2.5 standards.

Waste stream use – With widespread retrofit campaign, salvage of existing building materials is possible, creating secondary market for building stock and reducing space requirements at Borough landfill.

Economic development – Funds made available by lending institutions create employment. The impact on economic development can be substantial if we assume the workforce and materials for retrofits will be locally supplied and that households realizing cost savings will re-allocate their discretionary spending. Finally, the workforce, products and services developed in the course of the retrofits may well be a service headquartered in Fairbanks for export throughout the state.

Sustainability – Reduced reliance on fossil fuels can lower operating costs for families and for the community thereby increasing their sustainability. Simplifying infrastructure rather than elaborating it leads to sustainability.

Global warming – Since most power generation and home heating in Fairbanks relies on fossil fuels, we can directly reduce greenhouse gas emissions by conserving household energy and making our homes more efficient.

Meeting renewable portfolio standards - Using less energy, however, reduces the scale of generation capacity needed. Smaller loads can be met by smaller units. Potential renewable energy projects could look better in light of meeting smaller loads.

Wildfire mitigation – no effect.

Joint Utility Planning – Conservation/efficiency programs and expansion of distributed generation – or campaigns to that effect – would be helped greatly by joint utility planning.

Recommendations for Next Steps
Identify an organization to start the Energy Efficiency business.

Work with the FNSB School District staff to implement existing applied science energy curriculum.

Verify impediments to conservation and efficiency.

Determine what city and borough ordinances and policy and what state policies and legislation would create a favorable environment for energy conservation and efficiency.

Determine realistic near-term and mid-term activities to create demand for conservation/renewable measures. (Determine communications plan.)

Consolidate conservation/efficiency programs under an overall program addressing green building, to include new construction, energy rating, retrofits, weatherization, distributed generation, education, regulations, state and national policy.

Correlate Fairbanks Energy with Borough Resolution 2007-40, which commits the Borough to list opportunities and vulnerabilities related to climate change and to create an action plan to adapt and mitigate for climate change.

Correlate Fairbanks Energy with Mayor Whitaker's FLEX Energy Plan, especially the Non-fossil Fuel Energy Analysis.

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(1) Programs to Encourage Conservation and Efficiency in households:

- Energy Efficiency Interest Rate Reduction Program, AHFC
- Small Building Material Loan, AHFC
- Homeowners Association Loan Program, AHFC
- Alaska Building Energy Code – to qualify for AHFC loans for new construction, purchase of existing homes, or retrofit, these must be met.
- Golden Valley Electric Ass'n. - Builder $ense
- Golden Valley Electric Ass'n. – Home $ense
- Golden Valley Electric Ass'n. – home energy audit
- Golden Valley Electric Ass'n. - SNAP program
- Federal tax credits and exemptions
- Low Income Weatherization programs
- Technical assistance from UAF Cooperative Extension Commercial

- Golden Valley Electric Association - Business $ense Government/Public
- Energy Standards for Public Buildings
- Appliance/Equipment Efficiency Standards

(2) Adapted from Rich Seifert, Professor of Energy and Housing, and UAF Cooperative Extension Officer, http://www.uaf.edu/ces/faculty/seifert/energy.html

(3) Page 4, Tackling Climate Change in the US: Potential Carbon Emissions Reductions from Energy Efficiency and Renewable Energy by 2030.)

A Summary of the Built Environment Energy Efficiency Program (BEEEP)

Developed by the Cold Climate Housing Research Center

Program Benefits

Economic

- Employ new energy raters (approximately 9 @ $40,000 per year).
- Create work for those with retrofit capabilities (approximately 12 workers @ $40k – 50k).
- Enable residents to save money over time by spending less on energy efficiency measures than they would on energy (payback periods ranging from approximately 2 mo. to 10 yrs).
- Dollars saved will circulate in the community.

Environmental

- Reduce the amount of greenhouse gases and particulate emissions generated in the FNSB.

Program Energy Evaluation and Retrofit Outcomes

The CCHRC estimates the following number of energy evaluations and retrofits will occur during the first three years of the program:

- Approximately 4,000 homes in the FNSB will undergo a comprehensive energy evaluation.
- Approximately 1,500 homes will undergo significant retrofit.

Program Cost

Approximately $275,000 per year for three years is unfunded. This figure assumes that all other identified funding sources fully fund the program.

Overview

CCHRC developed a comprehensive energy efficiency program concept which will lead to a built environment market transformation in the Fairbanks North Star Borough (FNSB).

The program is comprised of four interdependent subprograms, some of which exist to some degree today and others which will be developed. The four subprograms are the Outreach and Awareness Program, the Energy Evaluation and Rating Program, the Training and Certification Program, and the Financial Resources for Energy Efficiency Program.

The subprograms work seamlessly to first make the consumer aware of the economic and environmental efficacy of creating a more energy efficient built environment, the steps that can be taken, and the resources available to

complete the steps. The programs will encourage consumers to participate in an energy evaluation and rating which will provide the consumer with a list of recommendations to make their home more energy efficient.

The program will assist consumers by providing information about suppliers and contractors able to provide the products and services consumers choose to pursue. The program will also provide consumers information relating to financial resources including existing low interest loans and tax incentives.

Parallel to working with consumers, the program will offer training and certification services to contractors and other professionals involved in the built environment to ensure that the local professionals are able to perform the work necessary to meet consumer demand.

The program will incorporate existing energy efficiency programs under one umbrella, including Golden Valley Electric Association's (GVEA) Home $ense program, and Alaska Housing Finance Corporation's (AHFC) energy rating and low interest loan programs. Other program components will be developed to complete the range of services herein described.

Outreach and Education Sub-Program

The Outreach Program will encourage and educate the public of the availability, benefits, installation and use of high efficiency products, renewable energy and CHP technology that will result in lower energy costs and lower emissions of greenhouse gases and particulates.

A focus of this program will be to provide "one-stop shopping" for consumers for the help needed to make informed decisions. The Program will provide a centralized means of obtaining the information they need to make their homes and buildings more energy efficient via our website, library, informational materials, classes, tours, personal consultations, individual home evaluations, presentations, and demonstrations.

Energy Evaluation and Rating Sub-Program

The primary objective of the Energy Evaluation and Rating Program is to coordinate and enhance the existing Home $ense program administered by the GVEA and the Energy Rater program provided by the AHFC to provide more comprehensive evaluations of existing buildings. The Evaluation Program will provide information and help to consumers who want to make their homes as energy efficient as possible but don't necessarily know what to do or how to do it. The cost of an evaluation will be subsidized at an affordable rate which takes into account the purpose of the program, the level of service offered and the longevity of the program.

The Energy Evaluator will give the consumer a detailed list of potential energy saving measures for their home and the associated cost and payback time for each of the measures. The Evaluators will also provide information packets compiled through the Outreach Program (described in previous section above) on topics such as product information, lists of contractors, and financing options.

If the homeowner needs further information, they can set up an appointment with the Project Manager who will review the intake form, inspection notes, list of recommendations and information given and will give additional materials and advice to the homeowner.

Training and Certification Sub-Program

The Training and Certification Program's primary objective is to train a cadre of contractors to do the work needed to make homes and buildings more energy efficient. The Training and Certification Program (hereafter, the Training Program) will serve to encourage the adoption of energy efficient design, technologies, and practices in new construction and retrofits to achieve energy efficient goals in residential and other buildings.

The Training Program will organize workshops and training opportunities to improve knowledge and understanding of energy efficient construction techniques and renewable energy standards, policies, products and materials for contractors, builders, architects, engineers, and other professionals.

The Training Program will coordinate certification training to increase the number of professionals needed in "niche" areas such as renewable energy system installers, energy inspections, data control technology, waste water

treatment, building and installing masonry heaters, etc. This will build regional and local technical capacity and create new jobs.

CCHRC is collaborating with experts in building and energy sciences from the University of Alaska Fairbanks (UAF), Josyln Castle Institute for Sustainable Communities (JCISC) and Siemens Communication/ Education Department to develop and integrate new educational curriculum into schools and universities. The curriculum will build awareness of sustainability issues and will encourage students to pursue careers such as facilities management, construction management, engineering, etc.

Financial Resources for Energy Efficiency Sub-Program

The primary objective of Financial Resources for Energy Efficiency (FREE) Program (hereafter, the Finance Program) is to provide financial information to consumers and to expand the availability of financial services from lenders and other financial institutions.

There are a few resources currently available to help finance energy efficient upgrades. AHFC presently offers a low-interest loan program in rural Alaska for energy efficiency upgrades. We propose to work with AHFC, the Alaska State Legislature, the Fairbanks North Star Borough, and private lenders, to make such loans available in Fairbanks as well. CCHRC has had conversations with key personnel in all of these entities and they are interested in seeing this program become a reality.

The Finance Program will help consumers to understand the range of options including AHFC and other available energy efficiency lending programs. The energy efficiency loan is a home improvement loan from participating lenders where the homeowner qualifies for the loan based on their projected increased cash flow gained from having a more energy efficient house. If these loans can be guaranteed by a government agency, private lenders can offer very low interest rates. The Project Manager will supervise this program and the Outreach and Training Coordinator will implement it.