ALASKA STATE LEGISLATURE
SENATE RESOURCES STANDING COMMITTEE
March 3, 2010
10:01 a.m.

MEMBERS PRESENT

Senator Bill Wielechowski, Co-Chair
Senator Gary Stevens

MEMBERS ABSENT

Senator Lesil McGuire, Co-Chair
Senator Charlie Huggins, Vice Chair
Senator Hollis French
Senator Bert Stedman
Senator Thomas Wagoner

OTHER LEGISLATORS PRESENT

Representative David Guttenberg
Senator Dennis Egan

COMMITTEE CALENDAR

Overview: AHFC Weatherization Program

- HEARD

PREVIOUS COMMITTEE ACTION

No previous action to record

WITNESS REGISTER

CARY BOLLING, Energy Specialist
Alaska Housing Finance Corporation (AHFC)
Juneau, AK
POSITION STATEMENT: Presented overview on AHFC Weatherization Program

ACTION NARRATIVE

10:01:12 AM
CO-CHAIR BILL WIELECHOWSKI called the Alaska State Senate Resources Standing Committee meeting to order at 10:01 a.m.

Present at the call to order were Senators Stevens and Wielechowski.

Overview of the Alaska Housing Finance Corporation (AHFC) Weatherization Program

10:01:36 AM
CO-CHAIR WIELECHOWSKI announced the overview of the Alaska Housing Finance Corporation (AHFC) Weatherization Program. He said this was of benefit to the public on how to make their homes and businesses more energy efficient.

CARY BOLLING, AHFC Energy Specialist, Alaska Housing Finance Corporation, said he had been with AHFC since 1992 mainly researching information on housing construction, energy efficiency, building science and renewable energy, and trying to get that information out to people through their research information center and presentations to consumers and builders. He said the program embodies two different strategies - conservation and efficiency. Conservation is cutting back and involves things like opening the refrigerator less and turning off lights; and efficiency usually involves using technology or "doing more with less" like using energy efficient bulbs and programmable thermostats.

10:04:05 AM
He also reminded people to look at what the energy usage is on their product purchases; lots of products have energy star labels from washing machines to televisions. He compared two televisions (TV) made by the same manufacturer that were both the same size but one used 177 watts of electricity and the other used 118 watts. He emphasized the "standby power" that is involved when a product looks like it's off, but it really isn't. One of the TVs drew only a little over 1 watt of electricity when it's off, but the bottom one drew 40.04 watts. Energy star labeled products have to meet some kind of guideline for the standby power. The savings can be considerable for places like rural areas.

10:06:02 AM
Slide 4 illustrated how a $100-investment in a house could cut someone's energy costs. For instance, he bought 10 compact fluorescent lights (CFL) that use a quarter of the energy of a standard light bulb at $3/ea. And showerheads - most put out about 3-5 gallons of water per minute, but you can cut down the amount of hot water by getting a showerhead that uses half of that amount - 1.6 gallon per minute. It's simple to install. A

water heater blanket is about $20 and easy to install, as well. Then there are the doors and windows - weather strip and caulk for those cost of about $15. Where car block heaters are needed to keep engines warm during the winter, a timer can be used to turn it on two hours beforehand instead of leaving it on all night. The last thing is phantom power loads - the standby power losses with electronics like video games and electronics battery chargers; that can add up to 100 watts of electricity that is on all the time. His calculation showed a person would save a total of $650.00/year - $200 for using the light bulbs, $80 from using and energy efficient showerhead, $20 from using a water heater blanket that will pay for itself in one year, $40 from caulking and weather stripping, $100 from using a power strip, and $200 from using a car block heater timer. But this is what is called "the low-hanging fruit."

10:11:03 AM
MR. BOLLING's Home Energy Use Chart (slide 6) broke down home energy use into categories. The really big chunk of energy use, especially in Alaska, is space heating. For this one must understand how a house works which could involve major improvements, but he cautioned that caulking and insulating a lot but may cause unintended consequences. He illustrated his points with a little story about how "Grandma's house" works or what some call Building Science 101. Her house has very little insulation, built maybe 50 years ago - very drafty. It was built when energy was cheap. A pot of water on the heating system for humidity was putting moisture into the air. This was done because typically in Alaska outdoor air is cold and dry - and it's blowing through the house drying it out more.

He explained that a house works just like a chimney. The cold air comes in cold and low through cracks and leaks around the bottom of the house and goes out up and hot through cracks and leaks in the ceiling - the part most people don't typically get. All the light fixtures and attic places have little cracks. Escaping warm air can be pretty significant when it is all added up.

10:14:26 AM
Back to his Grandma illustration: energy is expensive, so she hired someone to install more insulation. But problems can be created without understanding how the house works as a system. The drafts and cracks need to be caulked and sealed to stop the air from coming in and going out. Now what happens is that warm moist air gets into the attic, which is a lot colder because of the added insulation, and that air freezes. Then when it gets

warmer outside, it melts and drips back down and starts causing durability problems. So, she should caulk around the light fixtures in the ceiling to keep the moist air in. Another indication that too much moisture is in the attic is when moisture freezes on its way out through a gable vent.

10:17:19 AM
You can tell Grandma to take her pot off the stove, Mr. Bolling said, but a family of 4 creates 1100 gallons of moisture a year (slide 14). It's got to go some place. So when the weather conditions get right the house gets ice damming. Snow gets on the roof, the snow right next to the roof is melting because the attic is warm; it runs down and hits the cold outside edge of the roof and freezes, and causes giant icicles. Then a whole ridge of ice can form along the edge of the roof that becomes an actual dam so that the water running under the snow layer can't get over the dam and it starts backing up underneath the shingles. A lot of people don't understand this because they go through the "icicle dam follies," which means they think they need more insulation in their attic. But they really need to seal up all the cracks and leaks in the ceiling that are allowing warm to get up into it. That solves 90-95 percent of the problems.

10:19:55 AM
He explained that a good air seal is put on the warm side of the insulation in Alaska's climate. In new homes that is done by putting Visqueen plastic film around the house (slide 17). In a retro-fit situation, you try to caulk and seal up as best you can (slide 18). Once the house is tightened up, however, the house system makes the inside moisture go to the coldest surface; it condenses on the windows and starts dripping and even freezing presenting durability issues. Or it goes to a very extreme example of mold. The moist air condenses on the warmer surfaces like a stud - more durability issues.

He said the moisture must get out somehow. Why not just open a window? That doesn't always provide ventilation because you need a driving force to move air in or out of a house. Only three things can do that - wind, temperature or a mechanical ventilation system (MVS). The only thing you can control is the mechanical ventilation system. However, simply running the bathroom fan longer provides background ventilation for the whole house that can have indoor air quality issues other than moisture once it has been tightened up.

MR. BOLLING said using a bathroom fans is fine in those situations. However most of them don't get used because they are not rated to run continuously so they can burn out; they are also not very energy efficient, and - the main reason - they are noisy.

10:24:56 AM
New fans are quieter, energy efficient, continuous-duty rated, and cost $100-200. A controller can control how often it comes on and off to keep the indoor air in good shape. On the other hand some people put in heat recovery ventilators (HRV). When they exhaust the air out of the house these recapture some of the heat and use it to preheat the cold air coming in; the newer units use energy efficient fans. But installing a system like this costs thousands of dollars instead of hundreds. The bottom line is that you want your house built tight, but you want it ventilated right.

10:27:28 AM
The building code says burning fuel inside a house for a heating system (slide 23) has to use air for the combustion process that comes from outside the house. For Grandma's house that is now nice and tight, this means when she cooks she turns on the range hood and it can suck a lot of air out of the house; the same for a clothes dryer. For the heating system that doesn't have an outside air supply this means because of all the suction in the house, instead of smoke going up the stack, it comes down the stack and into the house - in the form of carbon monoxide, which is colorless, odorless, and deadly.

Building code says you need outside air for a furnace to burn fuel, Mr. Bolling said. So, typically you will see holes punched in walls with a louvered vent that will dump air near the fuel burning appliance. They need to be there, but it is a pretty primitive way to supply combustion air to these units. A better strategy if you are going to upgrade your heating system is to use one that is direct-vented or uses a sealed combustion system that injects the air right into the combustion chamber where the fuel is burned, and takes the exhaust out as well. It's safer and less prone to back drafting. A carbon monoxide detector is required by law. Everything should be safe, durable, efficient and affordable.

CO-CHAIR WIELECHOWSKI noted that Representative Guttenberg was present.

10:33:27 AM

MR. BOLLING summarized that one begins building tight and ventilating right by first sealing up the house; then insulating.

10:35:33 AM
SENATOR WIELECHOWSKI asked if a specific type of caulk should be used.

MR. BOLLING replied that silicone is a universally benign product to use - unless it has to be painted. More important to think about is caulking around something that will get hot. It should also be caulk that lasts a long time, 20 years or longer. He used illustrations to show different techniques for insulating around different items like electrical outlets and chimneys saying that typically you have to make insulation dams yourself that keep insulation from touching hot surfaces. This information is on AHFC's energy star website.

He said once everything is sealed on top, then you seal where the air is coming in low and that typically is where the foundation wall meets the floor framing, the rim joist area. Sometimes insulation is stuffed in that area, but if you pull it out and see a lot of dirt, that means air is coming in from outside. That should all be sealed up by installing rigid foam board that has been cut to size and caulking around it; then draping insulation down the wall. It's important to keep the area dry and that is accomplished with ground vapor retarder that is sealed with red tape. Don't use duck tape, he warned, because it tends to dry up and fall off after a couple of years.

Seal first and then insulate, he instructed. Typically, it's easy to add insulation in the attic, but being careful to create barriers around things that get hot, maybe with wire mesh. He suggested getting rid of recessed light fixtures because they get very hot and have holes in them to keep them cool. So they are pumping a lot of hot air up into the attic causing ice damming problems and energy loss. Sometimes you can build an insulated box around them, but carefully. Luckily several products are now available so that recessed light fixtures can be sealed from inside the house.

He emphasized that attics and roofs need to be ventilated; soffit vents allow air to come in and ridge and gable vents allow it to go out over the insulation. You don't want so much insulation that it blocks the air flow.

CO-CHAIR WIELECHOWSKI asked if electrical outlets should be insulated in some way.

MR. BOLLING answered that you can put foam gaskets behind the covers. The big air leakers are the ones that are really high and really low; then hit the foam gaskets.

10:45:47 AM
He summarized that the top priority is to caulk and seal air leaks between ceiling and attic, around crawlspace or basement rim joist, and doors and windows. Then add more insulation to the attic and crawlspace or basement walls. Then get a heating and water heating system check up annually for safety and efficiency. And last but not least provide proper ventilation for the house - for health and safety: at least install a quiet energy-efficient bathroom fan.

10:48:44 AM
CO-CHAIR WIELECHOWSKI asked if using water heater blankets make the heaters sweat and rust out.

MR. BOLLING answered that most of the newer water heaters are better insulated than they used to be, so additional insulation may not be needed. If the water heater feels really warm, you may need one. Getting the right blanket is important for dealing with the sweating issue. Some are fiberglass and some use a bubble pack. Sweating could also be coming from the presence of too much moisture in that area.

CO-CHAIR WIELECHOWSKI asked how to keep cold air from coming in through dryer vents and bathroom fans.

MR. BOLLING answered that the newer bathroom fans have a damper that shuts off when the fan is not on; another damper closes on the outside. Dryer vents typically have a flapper on the outside; but some have a shuttle device that uses the force of the air from the dryer to push up a little gasket. When the dryer is turned off the gasket falls back down and covers the hole making a better seal than the flapper.

CO-CHAIR WIELECHOWSKI asked for ways to improve efficiency on wood stoves and fire places.

MR. BOLLING responded that generally the open hearth fire places are energy losers because so much air that has already been heated is going up the chimney. Use them sparingly and not in the winter, he stated, and when they are not being used, use one

of several low cost ways to make sure they are sealed properly. Make a pillow out of squishy foam in a plastic bag and fit it into the throat of the chimney, for instance. But make sure it is removed before ever starting a fire.

CO-CHAIR WIELECHOWSKI asked for efficiency suggestions on "warm roofs" that have no attics.

MR. BOLLING answered that you have to attack any air that is leaking up to the roof from inside the house from the bottom side. One strategy is caulking around the light fixtures on the inside, doing the retro-fit kits for recessed light fixtures, and trying to get as much as you can from inside the house. Typically air leakage is the biggest source of heat loss; sealing them up will make a major difference in reducing heat loss and preventing ice damming - even without sufficient insulation. For a much bigger project, one could build another roof on top of the old one that adds insulation.

CO-CHAIR WIELECHOWSKI asked him to talk a little bit about tax credits for Alaskans and the Energy Rebate Program.

10:56:16 AM
MR. BOLLING replied that you can get federal tax credits for becoming more energy efficient. The best place is get information on this is on their energy star website (www.energystar.gov). You can take up to 30 percent of the cost of many energy saving items up to a maximum of $1500 total off your taxes. It's called a tax credit, not a deduction, and comes off the amount of tax you pay. The state has the Home Energy Rebate Program available through the AHFC for people who have the money upfront to pay for energy improvements. The Weatherization Program is available for people who meet certain income guidelines at no cost.

10:59:05 AM
CO-CHAIR WIELECHOWSKI thanked him for his presentation and finding no further business adjourned the meeting at 10:59 p.m.