HUD, STATE OF ALASKA & AK REGIONAL HOUSING AUTHORITIES
| AN ENERGY EFFICIENCY PARTNERSHIP SUCCESS STORY
April 29, 2014

Presented by:
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Aleutian Housing Authority
14 RHA’s

Created in the early 1970’s under Title 18 of Alaska Statues
Alaska Native Regional Housing Authority Overview

Major conduit for federal, state & private affordable housing funding & services
Alaska Native Regional Housing Authority Overview

- 51 NAHASDA Recipients
  - 14 Regional Housing Authorities (TDHE’s)
  - 194 Tribes
  - 37 Individual Tribal Recipients

Total Alaska NAHASDA Allocation = $91,656,892
  - RHA’s = $77,501,997
  - ITR = $14,154,895
Regional Housing Authority Overview
12,000 new homes since 1971

New SFH | Unalaska, Alaska
2012 RHA operations resulted in:

- Energy efficient homes: 190
- Homes weatherized: 1,220
- Homes rehabilitated: 740
- Housing units managed: 4,100
In 2012, RHAs generated $273 million in economic activity and 2,240 jobs for Alaskans.

$99 million invested in construction, home improvement and acquisition.
Funding

Three significant sources of funding for improving energy efficiency:

1. NAHASDA | federal
2. Supplemental Housing Grant Program | state
3. Weatherization | state
AHFC SUPPLEMENTAL HOUSING GRANT

Purpose

Provides a 20% match to federal HUD funds for:

- **Energy efficient design features**
- **On-site water & sewer facilities**;
- **Roads to project sites**; and
- **Electrical distribution systems**
Requires adherence to State BEES standards

No other required energy efficiency or building code standards in most of rural Alaska
Since 1993: High (2012): $11 M
Low (2000): $3.8 M
2014: $7 M

Results: Construction and rehabilitation of 11,700 units in over 250 communities
AHFC SUPPLEMENTAL HOUSING GRANT

AVCP Supplemental Grant Expenditures: $8,827,559 (92 Units)

AHA Supplemental Grant Expenditures: $1,211,807 (103 Units)
WEATHERIZATION
Total projected Weatherized Units through March 31, 2014: 13,500

- Average saving in ENERGY costs
- Low 20% (ANC) High 40% (AHA/NANA)

- Average annual HEATING FUEL savings
- 19.8 million gallons

- Average STATEWIDE dollar savings
- $46 million
RHA Weatherization Activity

2012

Weatherization Contracts
Contracts $22.6 million

Weatherization Activity
Units: 1220

Weatherization Workforce*
Trained Workforce: 1145

*highly specialized
Why is this Investment Important?

Alaskans burdened with significantly higher energy costs than rest of the US
Why is this Investment Important?

Alaska homes use Twice the total amount used as other homes classified as “cold / very cold climates”
Why is this Investment Important?

3 times the energy / sq. ft.

NANA region = $9.15 / sq. ft. (9x)

Average US = $.97
Why is this Investment Important?

Fuel price
Average in Alaska: $5.86
National average = $3.98

[$5.83 (SE) - $10.00 (Interior)]
Rural average much higher
Why is this Investment Important?

AK ranks 47th in the 2013 State Energy Efficiency Scorecard produced by the American Council for an Energy-Efficient Economy.
Why is this Investment Important?

19,810 Alaska homes (8% of occupied housing) estimated to be one-star rated
Why is this investment important?

Weatherization of existing infrastructure.

Greatest possible ROI and benefit to AK’s most needy population.
AHA Regional WX Activity
ATKA

- 1,100 miles from Anchorage
- 4.5 hour flight
- (RT) Airfare - $1750
- Heating fuel - $7.65 per gallon
- Electricity - $.75 per kwh
- Barge service 2 to 3 times per year
<table>
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<tr>
<th>WX Client No.</th>
<th>Annual Fuel Saving in gallons</th>
<th>Annual Cost Savings</th>
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<tr>
<td>15</td>
<td>302</td>
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<td><strong>3,731</strong></td>
<td><strong>$34,921.20</strong></td>
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<td><strong>Average</strong></td>
<td><strong>415</strong></td>
<td><strong>$3,880.13</strong></td>
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**ATKA Post Weatherization**

Average Client Savings **42%**
“My fuel cost was cut nearly in half. When you pay an upward of $8 dollars a gallon, this is significant. Prior to weatherization I would use roughly 800 to 900 gallons of fuel a year.”
Doing great work all across our region but Can we do even better?

Performance & Cost?
We are never afraid to question the status quo.

Innovation

We are always seeking continuous improvement.

We are never afraid to question the status quo.
LIVING ALEUTIAN HOME DESIGN COMPETITION
We learned a lot ...
No Magic Bullet
Process evolved into **Three** on-going projects / activities
Octagon Model (Designed to be “net-zero energy”)

Stabilized-insulated Rammed Earth Model

Optimization (of existing model)
Designed for Net-Zero Energy

Ventera VT10-240 – 10Kw Turbine

1000 Gal Thermal Storage Tank

Double-wall 2x4 Construction: Blown Fiberglass Insulation
Sand point A
– interior view
Sand point A – Birds Eye View
Looking to the Future: The Ultimate in Sustainable Housing

Stabilized-Insulated Rammed Earth
Rammed Earth Model

Earth Dwell LTD. + RMH Design

Sloping gently towards the south and the adjacent hillside the Aleutian Earth House is a simple shed form with a sod roof that blends the structure with the surrounding landscape, offers habitat for migratory birds, and provides additional thermal insulation. The thick earthen walls, erected from on-island subsoil, meld the structure into the landscape. The shifting lines of color reflect the variation in the subterranean strata and the presence of iron oxides found within the earth. The entire structure appears as though it emerged from the earth to facilitate the living experience of the inhabitants. The design is guided by the necessity to shelter, provide and inspire. The green roof provides multiple environmental benefits which extend beyond the structure and site; it will remove particulates from the atmosphere and act as a biofilter for the rainwater, before storage for use on the site.

Modern stabilized-insulated rammed earth walls are very durable, thermally efficient, non-toxic, and eliminate the necessity for other wall materials. Once the walls are stripped of the forms they are complete. There is no need for exterior siding, interior sheetrock, or paint. Electrical conduit and air ducts placed in the walls during construction allow for clean simple walls to surround the inhabitants. The wall finish is a reflection of the local soils and the ramming process. Using an abundant local material reduces the shipping cost for the project, offsetting the greater labor costs associated with rammed earth construction.
Rammed Earth

**PRO’S**

- Potential use of local materials
- Two wall elements instead of 8-9 for most if not all structural elements
- Construct the walls with a single process & walls are complete (possible exterior sealant)
Rammed Earth

CON’S

- Labor intensive;
- Materials may not be available
- Specialized skills
HUD “Sustainable Construction in Indian Country” Small Grant Program

AHA received $100K for “Stabilized Rammed Earth Demonstration & Technology Dissemination Project.”
Will conduct structural & energy efficiency performance research in partnership with West Virginia University – Constructed Facilities Center
AHA conducting PHPP12*

“optimization” modeling & analysis on existing and prototype models

(“Passive House Planning Package” v.12)
Strategies

Moving towards implementing "PH Standards" on all projects
Focus on

1. Quality (energy efficiencies / life cycle costs) over Quantity
2. End User Cost over TDC

Strategies
• Kodiak – Solar Thermal
• CIHA – Solar Thermal (Eagle River Project)
• THRHA – Ketchikan Heat Pumps / Wood Pellets
• AVCP – Interior Value Engineering
• NWIHA – Cold Climate/HUD (ICDBG) Project
Thank you!

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