Cold Climate Housing Research Center

Promoting and advancing the development of healthy, durable, and sustainable shelter for Alaskans and Circumpolar people
Sustainable Northern Communities

Promoting and advancing the development of healthy, affordable, sustainable shelter for Alaskans and Circumpolar people
The Need

32.5% of the housing stock is considered in need of major repair or falling apart.

74.4% of households are considered drafty.

21.8% of households are unable to maintain 70°F on cold days in the winter.

37.4% of households reported having mold or mildew in the home.

Fuel oil prices reach as high as $10/gallon.

55.9% of households have income less than $20,000.

Arctic is changing, 184 Alaskan communities threatened by erosion

Natural disasters are becoming more frequent
The most successful Arctic animals don’t have to eat more fuel to keep warm in the winter. Instead, they put their energy into high-quality fur and fat to maintain their body temperature.

RETAINING heat, not PRODUCING heat, is the most important part of an animal’s survival.
Traditional Housing In Alaska

Aleutian Islands

Anaktuvk Pass

Point Hope

Barrow
Atmautluak

Figure C5: Overcrowded Units

- Overcrowded: 677
- Occupied, Not overcrowded: 2,765
- Severely overcrowded: 853

Figure C13: Average Annual Home Energy Cost and Use

- Bethel Census Area: $6,442, 135
- Anchorage municipality: $2,786, 258
- National: $2,129, 91.45
Atmautluak partnerships ease of construction

owner investment health & comfort
Galena

3-bedroom integrated truss

R-60 thermal envelope

$100,000 for materials

150 gallons of heating oil/year, Average house uses 1,000
Galena

Average house: 1,000 gallons/yr

Prototype: 150 gallons/yr (modeled)
Quinhagak

- Wet, windy climate
- 55 homes in structural failure
Quinhagak

4-inch metal studs

Plastic spacer

R-40 walls, floor, roof
Prefab sections for speed of assembly
Instruction & Local Labor
Quinhagak House Performance

- 130 gallons fuel oil first winter
- Superior indoor air
- Built in 6 weeks
- Local labor force

- Light materials
- High owner comfort
- Significantly less cost
- Durable
North Slope

Average house: 900 gallons/yr

Prototype: 150 gallons/yr (modeled)
UAF Sustainable Village

TAMARACK

SPRUCE

4 PROTOTYPES
2 Wall Assemblies (R-50)
REMOTE System
with EPS
Arctic Wall system with cellulose
3 mechanical systems

BrHEAThe

Solar hydronic
Alaska Housing Assessment

- 75,000 housing units in 300 communities
- 30% of occupied housing in the state
- Data on energy use, air tightness, ventilation, overcrowding
- 20,000 1-Star homes in Alaska (7% of total homes)
2012 Update to BEES

• Homes must be 20-30% more efficient
• Saves homebuyers ~$700,000 in first year (based on 1,000 homes)
• $10 million over the life of the homes
Cost of Energy

- Average FBX household pays $8,000/yr for energy
- Average Bethel household pays > $6,000 for energy, uses half as much as Anchorage
Alaskans saved $70 million 2008-2012

- 1,574 new jobs from 2008-2012
- $25 million savings each year
- Every $1 million spent on retrofits create 12 short-term jobs
- Every $1 million spent in energy savings creates 11 long-term jobs
Dividends of Efficiency

- Average school can save $33,000/yr. w. efficiency upgrades
- LEDs, daylight sensors, occupancy controls
- 4-year payback
- Based on study of 150 schools in Alaska
Qagaasakung, Quyanaq, Quyana, Mahsi’, Gunalcheesh, Haw’aa, Thanks!

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