



Energy Efficiency Considerations for Southeast IRP

Sean Skaling
Energy Efficiency & Conservation
Program Manager
Alaska Energy Authority



The Mantra:

“Energy Efficiency First”



Advantages of Energy Efficiency

- Hundreds of proven technologies
- Cost effective
- Small measures (low cost of entry)
- Many non-technical measures



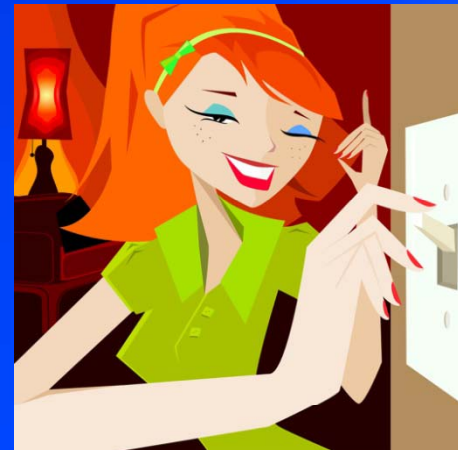
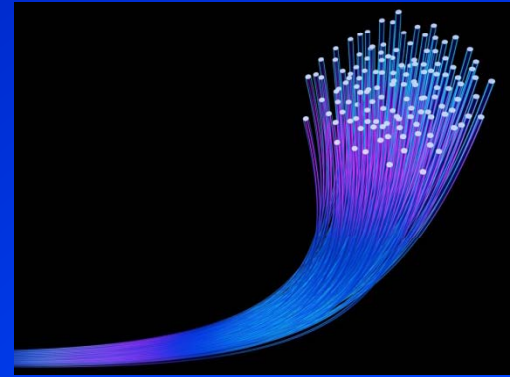
Disadvantages of EE

- Hundreds of proven technologies
 - lots to understand
- Many end-uses to address
- Just not as appealing as RE??



Efficiency or Conservation?

- Efficiency = Equipment
- Conservation = Behavior



Other Terms

- End-Use Efficiency
- Demand Side Management
- Demand Response
- Supply-Side Efficiency



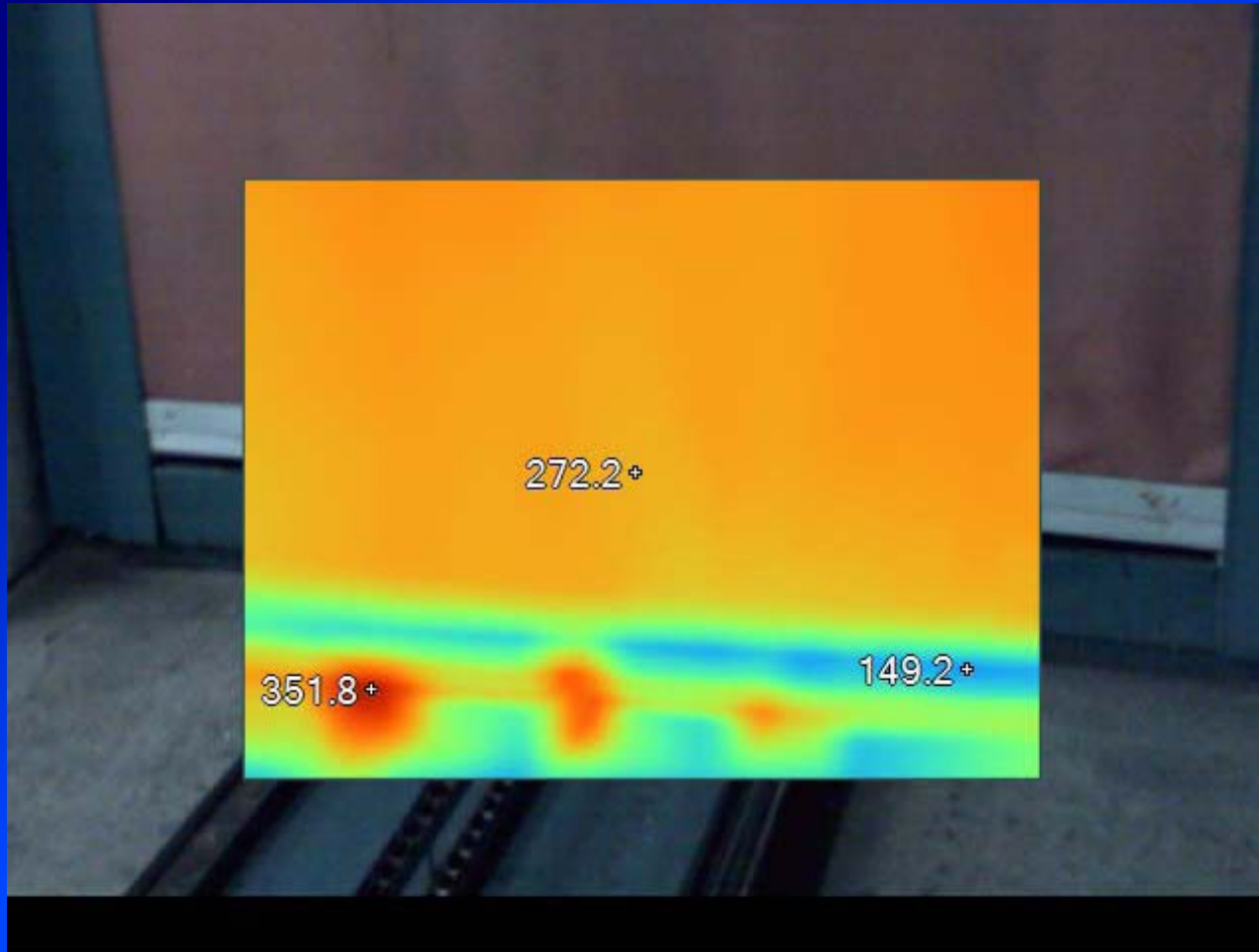
Programs



Industrial Audit Pilot Project

- Seafood Processing Plants
- Building AK capacity: UAF Institute of Northern Engineering & AK Sea Grant Marine Advisory Program
- Cordova: 2 processors assessed
- Processor “very pleased”
- Investing in EE & process efficiency
- Next: **Kodiak** (March) and **Bristol Bay** (summer)





Thermal Infrared Images and Temperature Points for Cordova Processor Shrink Wrap Oven

Projected energy savings: \$10,000 in two months!

Community Grants:

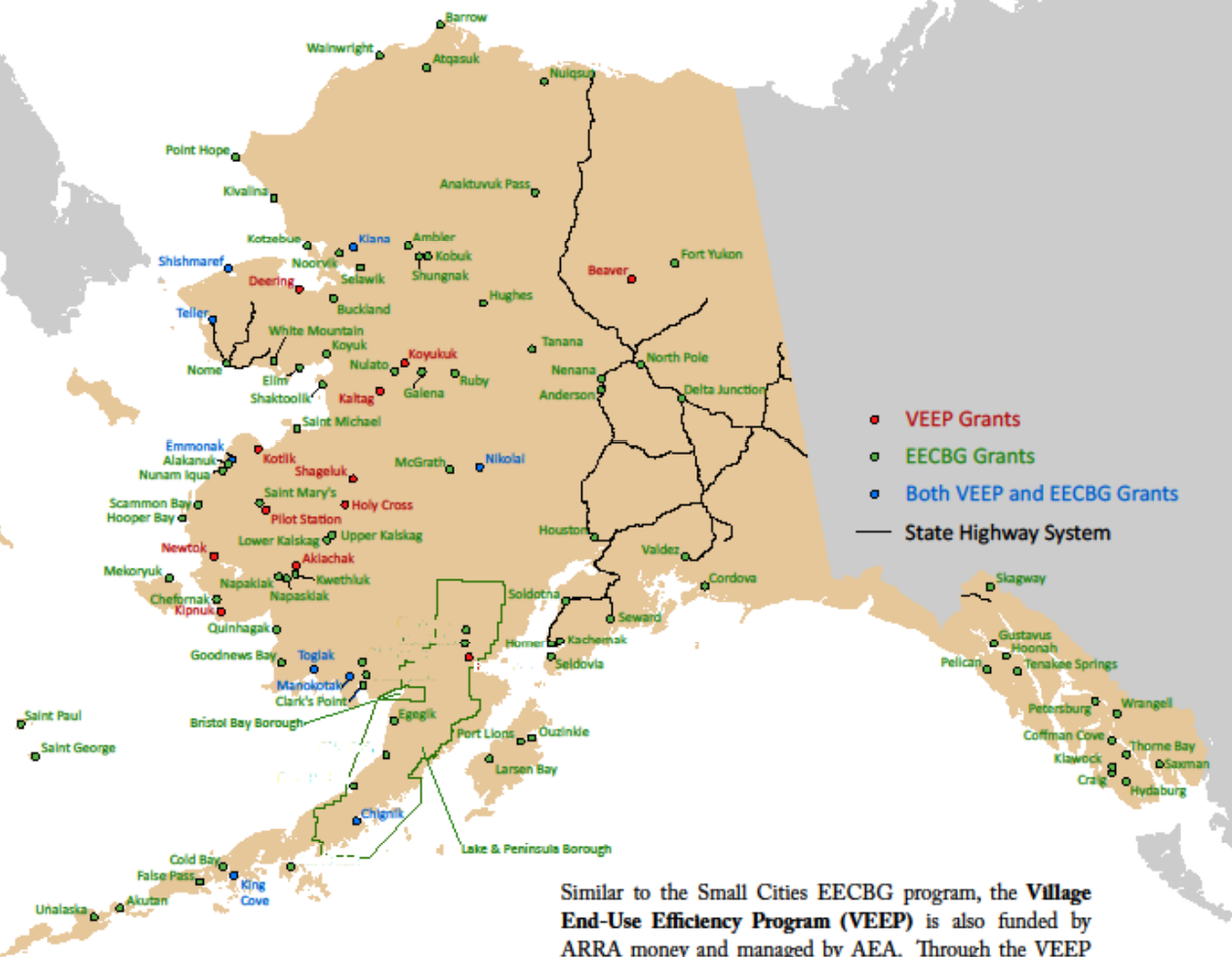
- Stimulus funding for communities to improve efficiency of public facilities
- 97 EECBG Cities, 21 VEEP, 3 Whole Village Retrofit
- \$8.5M ARRA, \$0.6M State
- Technical assistance provided
- Average payback of ~3 years historically
- Estimated community savings \$3M/yr.
- 11 year average life = **\$33M savings!**



Energy Efficiency and Conservation Recovery Act Funds at the Alaska Energy Authority 2010 - 2012

The **Small Cities Energy Efficiency and Conservation Block Grants (EECBG)** Program is a Recovery Act project intended to assist the country's smallest communities save money and create jobs through energy conservation and efficiency improvements in public buildings and public facilities.

In Alaska, 97 small communities have been awarded EECBG population-based allocations that range from about \$10,000 to over \$200,000. This program is managed by the Alaska Energy Authority (AEA) with money from the American Recovery and Reinvestment Act (ARRA) of 2009.



- VEEP Grants
- EECBG Grants
- Both VEEP and EECBG Grants
- State Highway System

Similar to the Small Cities EECBG program, the **Village End-Use Efficiency Program (VEEP)** is also funded by ARRA money and managed by AEA. Through the VEEP program an additional 12 small Alaskan communities will receive money and technical assistance to make cost saving energy efficiency and conservation improvements, and 9 other communities will receive funds to complement the work of their EECBG projects.



Emmonak Washeteria



Boiler tune up and new controls
Savings: 6,070 gal. diesel per year
Savings: \$21,000 per year



Napaskiak LED Street Lights



- Replaced nearly all (49) street lights
- Total Savings: 23,000 kWh/yr.
- Saves 1,770 gal. diesel/yr.



Commercial Energy Audit Program

- Audits for privately owned commercial buildings, statewide
- Large energy-using sector
- ARRA funding: 132 buildings in 2011
- Large variation in energy use
- Significant need, significant potential energy and cost savings



Audit Steps

- Hire qualified auditor
 - CEA, CEM, PE with experience
- Conduct audit
 - Report summarized by measure
- Submit for reimbursement
- Implement measures
- Report out in 1 year



Maximum Reimbursements

Sq ft up to	Heat only	HVAC
2,500	\$1,400	\$1,750
5,000	\$1,600	\$2,000
10,000	\$2,000	\$2,500
15,000	\$2,400	\$3,000
20,000	\$2,800	\$3,500
30,000	\$3,600	\$4,500
40,000	\$4,400	\$5,500
125,000	\$5,200	\$6,500



Numbers by Community

Anchorage	45	Angoon	1
Juneau	10	Atmautluak	1
Cooper Landing	8	Chuathbaluk	1
Fairbanks	8	Eagle River	1
Sitka	8	Gustavus	1
Bethel	6	Healy	1
Kenai	4	Hoonah	1
Delta Junction	3	Kake	1
False Pass	3	King Salmon	1
Homer	3	Kotzebue	1
Petersburg	3	Koyuk	1
Wasilla	3	Naknek	1
Anchor Point	2	Nelson Lagoon	1
Copper Center	2	Seward	1
Dillingham	2	Soldotna	1
Kodiak	2	Valdez	1
Nome	2	Wrangell	1
Palmer	2	Yakutat	1



Numbers by Sector

Other	45
Office	32
House of Worship	15
Retail	15
Hotel/Lodge	11
Warehouse	8
Medical Office	5
Restaurant	4
Bank	0
Grocery	0
Hospital	0
Total	135



Applicant Stats: Average & (mean)

- Average Year Built: 1975
- Square Footage: 16,600 (10,800)
- Annual Energy Cost: \$45,500 (\$20,800)
- Energy Cost per SF: \$3.21 (2.35)
- Range of Energy Cost/SF: \$0.37 – \$19.01



Other Applicant Stats

- Avg. commitment to payback: 4.5 years
- Share building energy costs: 135 (100%)
- Allow release of utility data: 100
- Allow sharing of building name: 134
- Energy conservation program: 129
- Energy conservation policy: 122
- Rate their auditor: 131



The Working Group & Outreach

- The Energy Efficiency and Conservation Working Group – a collaborative approach
- www.akenergyefficiency.org – consolidated information source for all audiences
- Energy Awareness Month – October; Statewide events





What's Happening

▼ **Commercial Benchmarking & Utility Analysis**

Anchorage, Alaska
Feb 01, 2011

Learn how to analyze the utility bills and consumption patterns to identify areas of potential savings in the building, and benchmarking that...

[Read More >](#)

▶ **Read Your Rating Class**

Alaska
Feb 02, 2011

▶ **Commercial Lighting Retrofits**

Anchorage, Alaska
Feb 02, 2011

▶ **Read Your Rating Class**

Alaska
Feb 09, 2011

[See More >](#)

Latest Energy News

Oil under control - Financial Times

NANA first private employer to fund RurAL CAP energy-efficiency program - Arctic Sounder

Pacific Northwest and Alaska Federal agencies reduce greenhouse gas emissions ... - U.S. EPA.gov (press release)

EUEC 2011 to Advance Aggressive Policy Goals Through Increased Trade on

Double your Dividend!

Prepare your home for the quickly approaching winter while saving money on utility bills every month by investing some of your PFD in energy efficiency improvements. Click...

[Read More >](#)



Your Community

Roll of Efficiency in Southeast IRP



What is the Role of EE in SE IRP?

Energy Efficiency is a Resource

...And a cost-effective one!

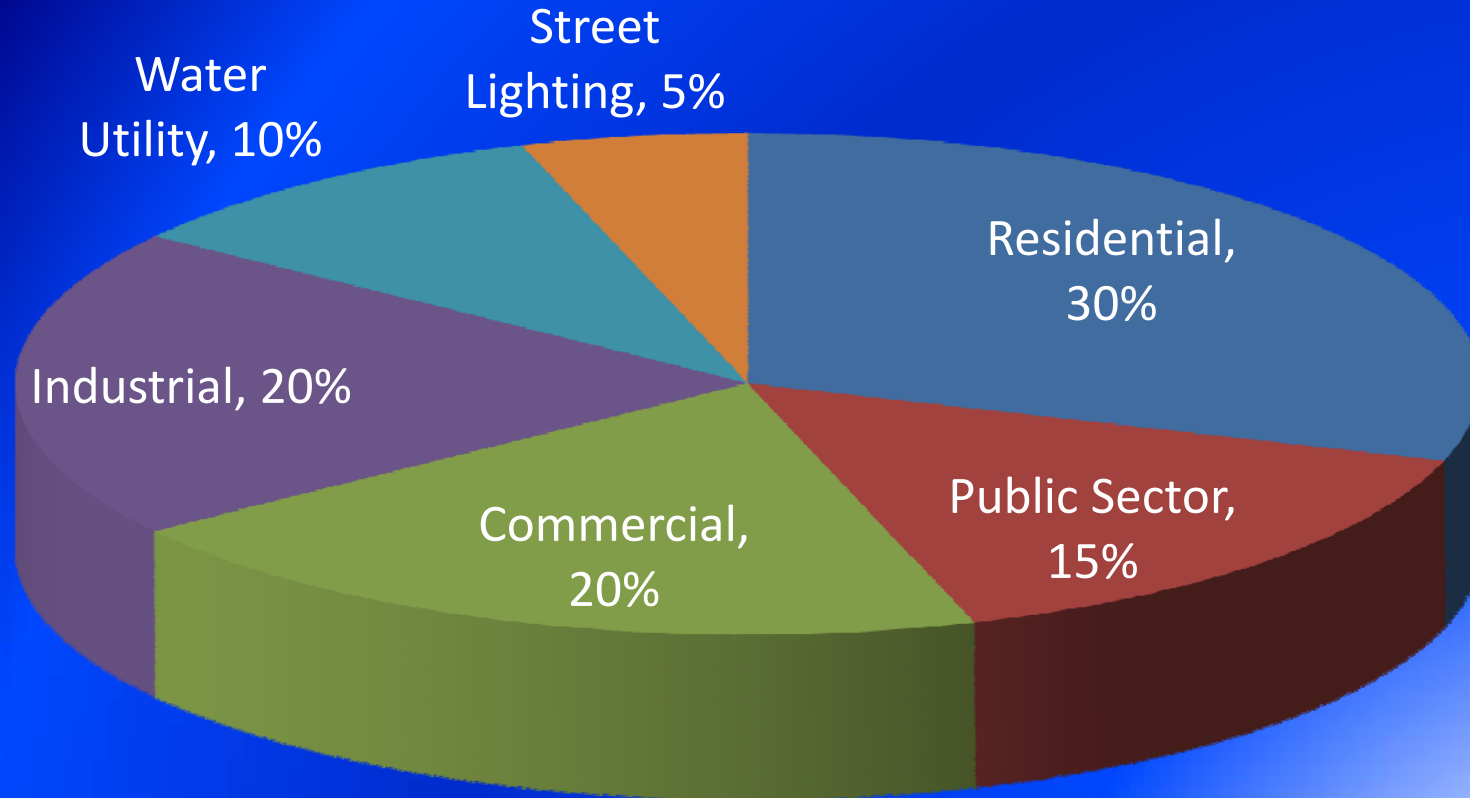


A Possible Approach

- Maximize efficiency of all end users
- Prioritize most cost effective & largest impacts
- All Sectors and Users
 - Residential
 - Public buildings
 - Commercial buildings
 - Industrial
 - Street lighting/water pumping/other



Sample Community



Residential

- Weatherization (maximize)
- Rebate program (promote)
- How to address residential electrical EE?
- How to address conservation/behavior?
 - Local opportunities
 - Community team approach/Utility program?
 - Residential electrical audits/conservation
 - Appliances, lights, timers, etc.



Residential Savings Potential

Rebate & Wx	Heat	Electric
Demonstrated savings per home	25%	5%
Penetration	25%	25%
Res % of Market	30%	30%
Total Community Energy Saved	1.9%	.4%
Electric Audits/Conservation	Heat	Electric
Demonstrated savings per home	3%	15%
Penetration	20%	20%
Res % of Market	30%	30%
Total Community Energy Saved	.2%	.9%
Total Residential Savings	2.1%	1.5%



Residential Savings Potential, 25%

Rebate & Wx	Heat	Electric
Demonstrated savings per home	25%	5%
Penetration	25%	25%
Res % of Market	30%	30%
Total Community Energy Saved	1.9%	.4%
Electric Audits/Conservation	Heat	Electric
Demonstrated savings per home	3%	15%
Penetration	20%	20%
Res % of Market	30%	30%
Total Community Energy Saved	.2%	.9%
Total Residential Savings	2.1%	1.5%



Residential Savings Potential @75%p

Rebate & Wx	Heat	Electric
Demonstrated savings per home	25%	5%
Penetration	75%	75%
Res % of Market	30%	30%
Total Community Energy Saved	5.6%	1.1%
Electric Audits/Conservation	Heat	Electric
Demonstrated savings per home	3%	15%
Penetration	75%	75%
Res % of Market	30%	30%
Total Community Energy Saved	.7%	3.4%
Total Residential Savings	6.3%	4.5%

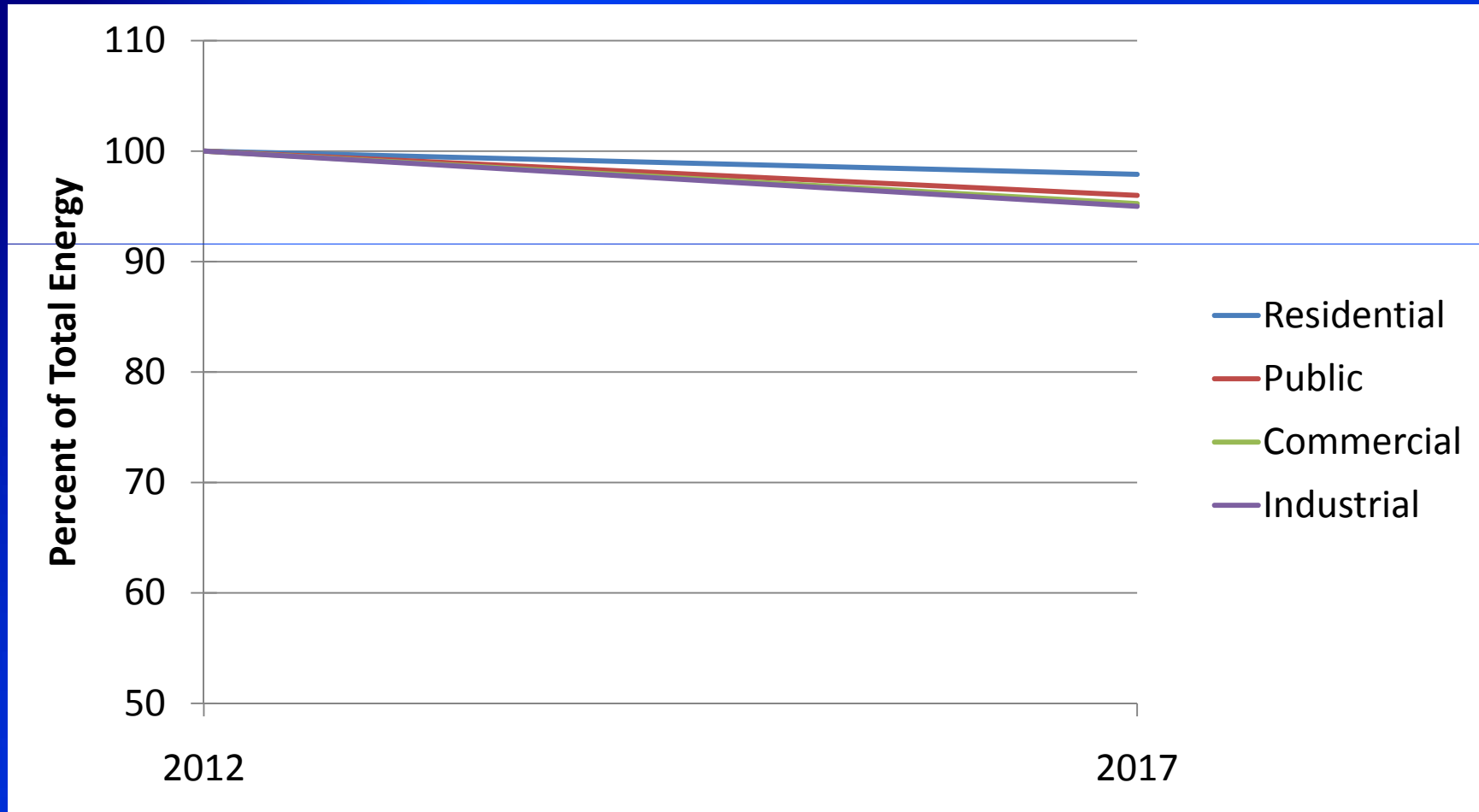


Public Buildings Savings Potential

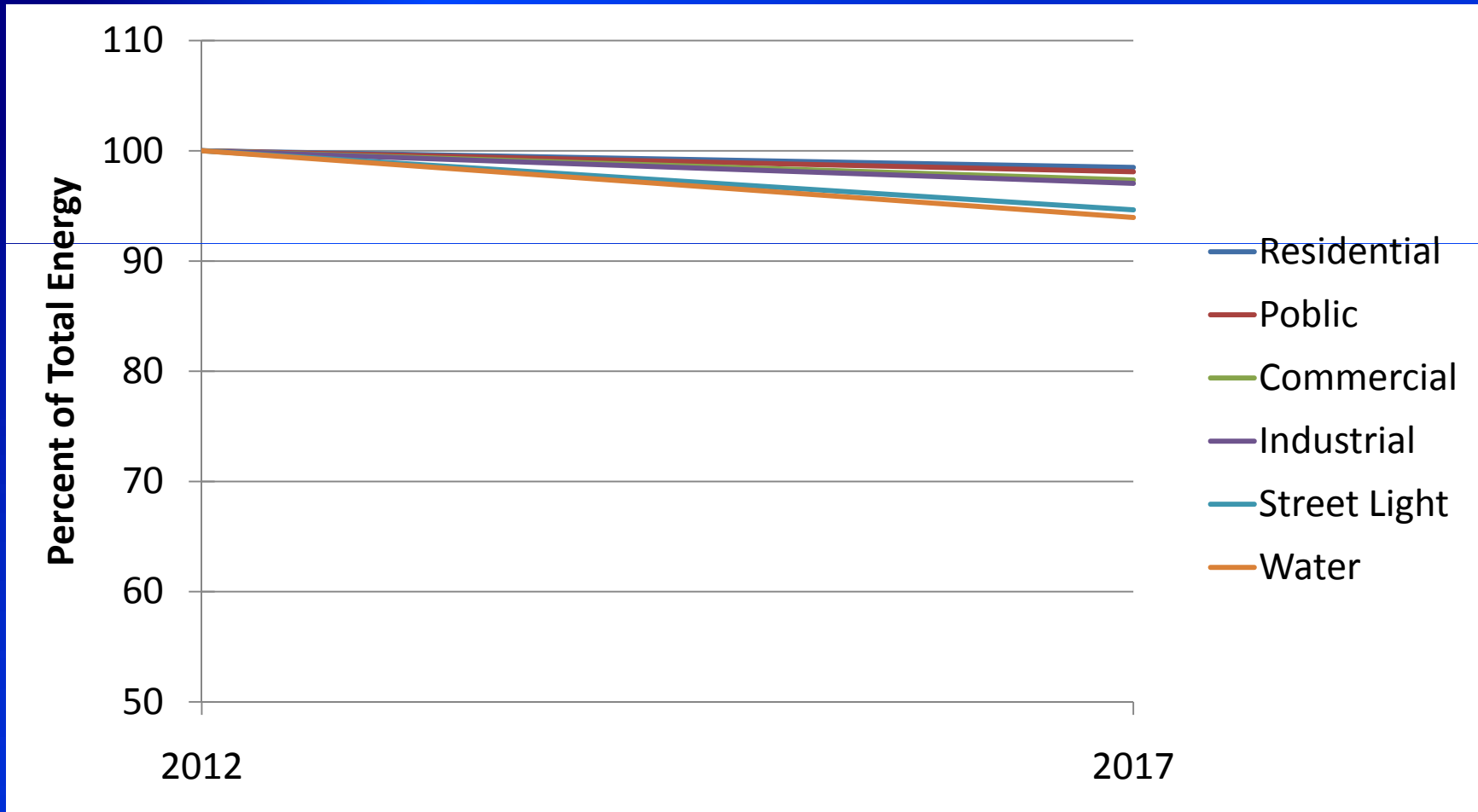
Whole Building Audit & Retrofit	Heat	Electric
Demonstrated savings per building	20%	20%
Penetration	50%	50%
Public % of Market	15%	15%
Total Community Energy Saved	1.9%	.4%



Total Heat Savings, 5 Years



Total Power Savings, 5 Years



Cost of “Efficiency Generation”

- Nationally: \$.03/kWh
- Alaska Village Energy Efficiency Program: <\$.15/ kWh**
- Estimate for SE Alaska: **\$.05 - \$.10** /kWh

**Investment also saved heating fuel, not included here.
Measured in remote villages, where cost of service is very high.



Observations on Strawman

- Requires **high penetration**
- Requires all sectors
- High penetration will take elbow grease and funding, and...
- Need a team of integrated stakeholders to deliver



Utility Perspective

- EE can cause friction within utilities
- Throughput incentive
- Decoupling/RCA
 - What is the cost of new generation
 - What is cost of EE/DSM
- EE Programs
- Consolidated effort



Funding

- Federal
- State Funding
 - Existing Programs and funding
 - New program and funding needs
- Utility Funding
 - System benefits charge
 - Decoupling
- Take charge, what does region need?



Delivery Options

- Existing state programs
- New state programs
- Local programs
- Utility programs
- 3rd party manager



Miscellaneous Concepts



Year of Research

- **End Use Study**
- **Policy Report**
- **Best Practices and Needs Assessment**
- **Public data interface/GIS**



EE Tips & Show and Tell



LED Lighting

Type	Brand	Supplier	Unit \$	Watt	Lumens	Life	Efficacy
LED	Enhancelite Gen II H	LEDnovation	\$51	6.1	615		101
LED	EnhanceLite Gen I 75	LEDnovation	\$26	9.8	700	35,000	71
CFL	60W Equiv CFL	n:vision	\$3	14	800	8,000	57
Incand	A-19 Soft White	Sylvania	<\$1	60	870	1,000	14.5



Hours of Operation

Look closely at hours of operation
of lights and equipment.

(Even the little stuff)

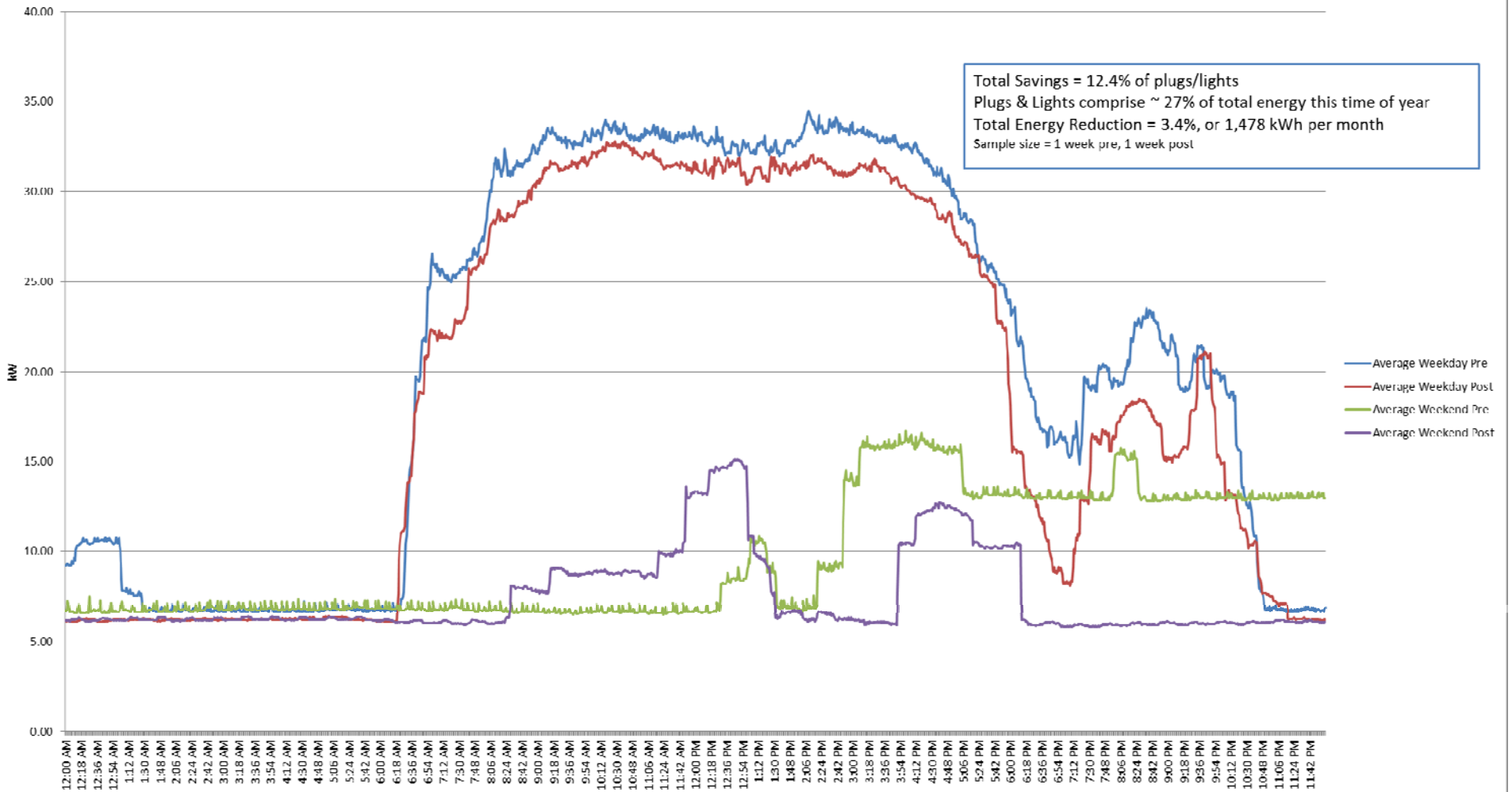


Rule of Thumb

- At electric rates of about 11.5 cents/kWh
- 1 Watt plugged in 24/7 costs \$1 per year
- A cable box using 34 W = \$34 per year!



AIDEA/AEA Building Daily Energy Use (Plug Loads and Lights Only) Pre and Post Implementation of Energy Policy (June 2010)



Solar Walls

Attaituq School Nunavut

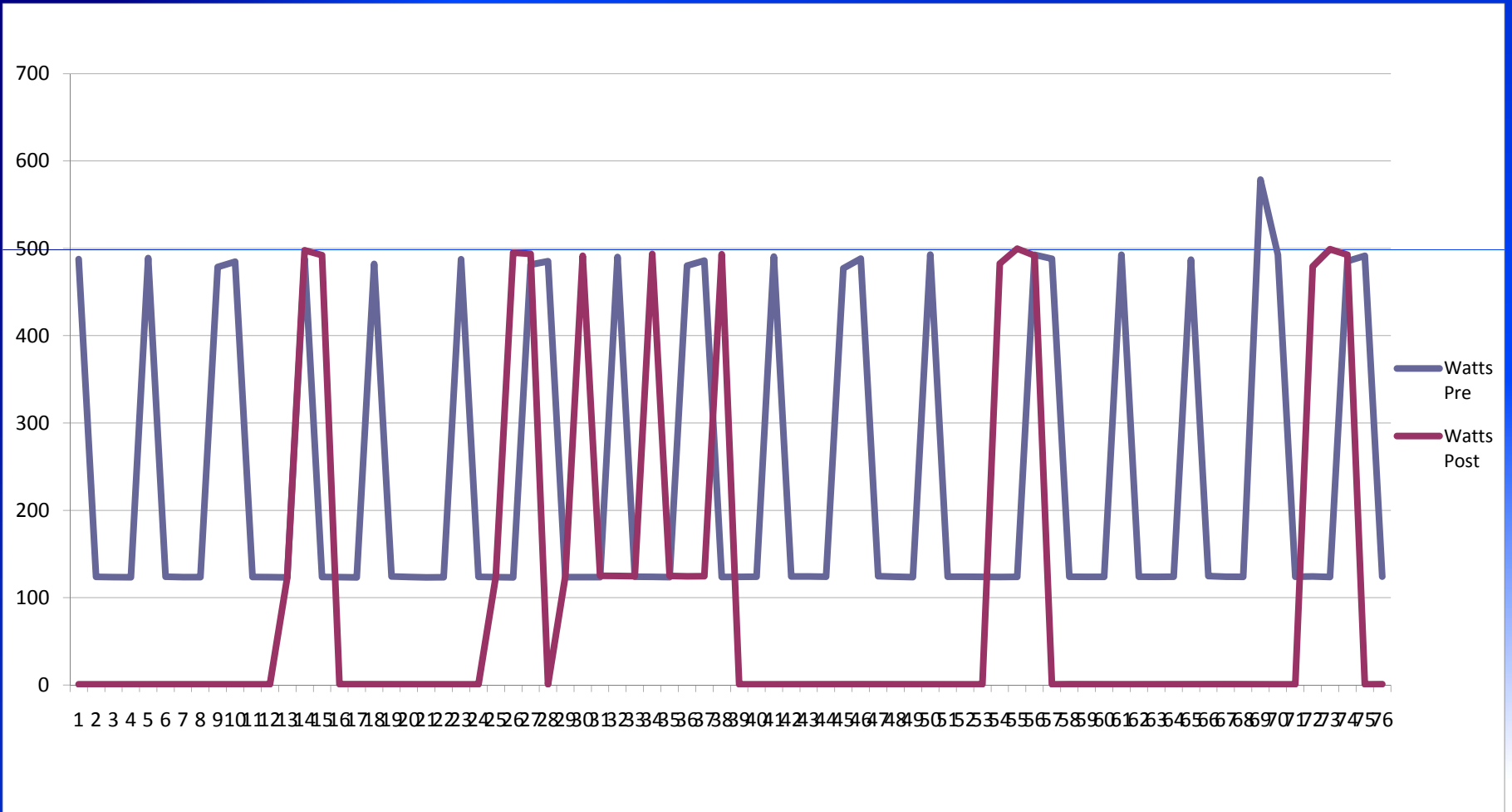


Vending Miser

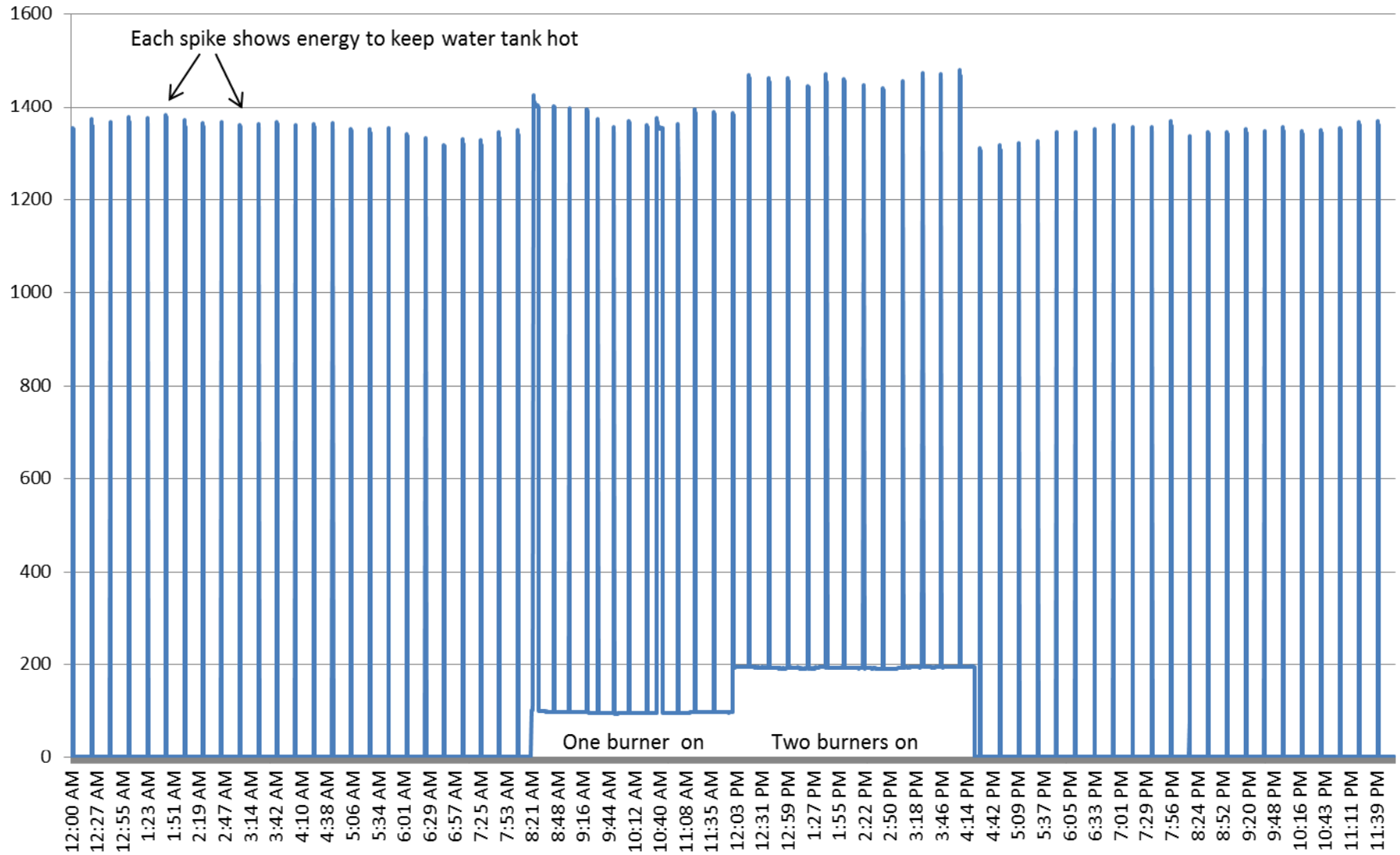




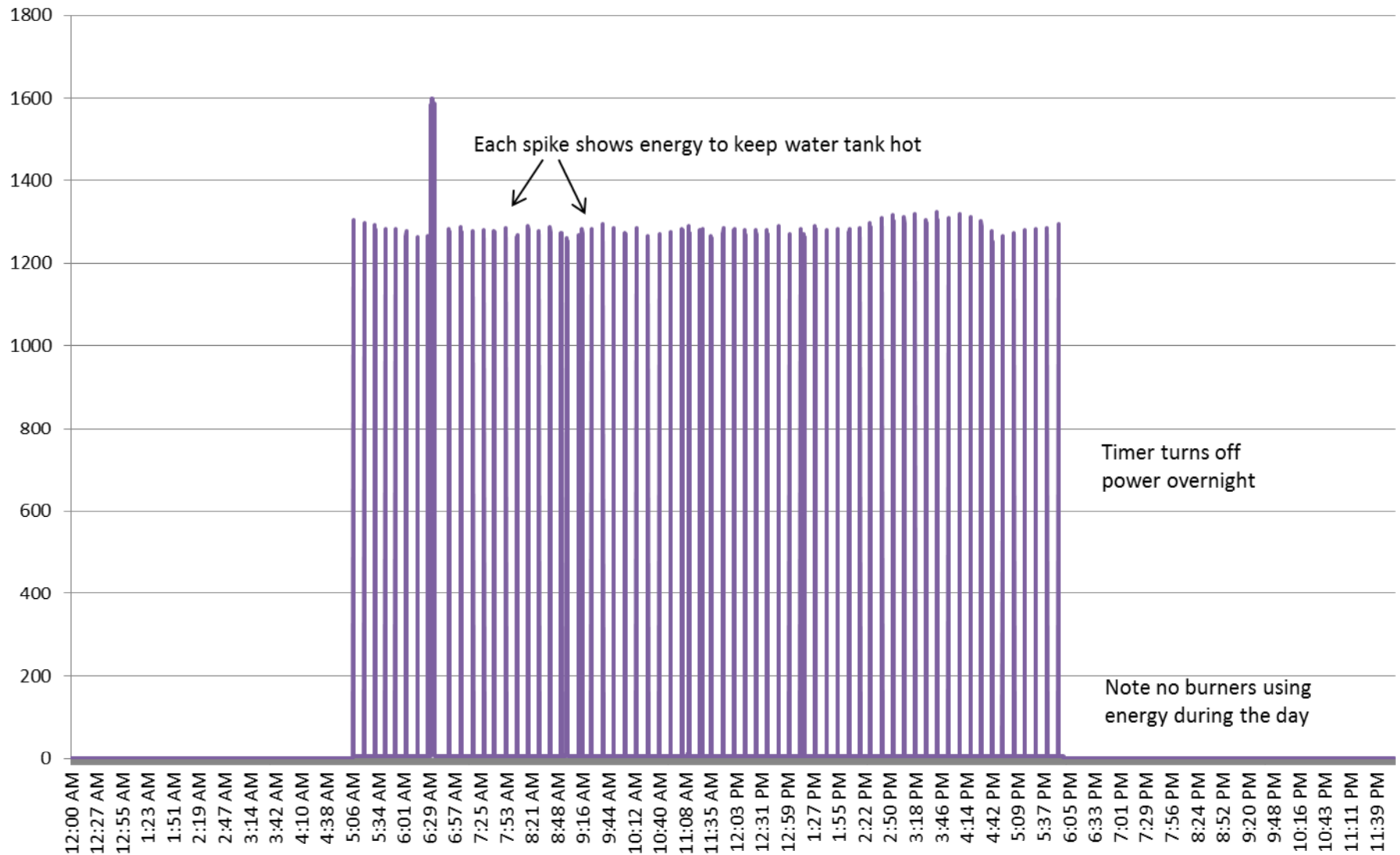
Tips: Vending Misers



3-Burner Coffee Maker without Timer (Total energy = 1,060 kWh/yr; Cost = \$131/yr)



Carafe-Style Coffee Maker with Timer (Total energy = 307 kWh/yr; Cost = \$38/yr)



Residential Building Energy Monitor



Refrigerator Savings Potential

Savings over 5 years at Nushagak Prices
(July 09 pre-PCE: \$.4630/kWh)

Age of Refrigerator	Side-by-Side	Bottom Freezer	Top Freezer	Refrigerator only	Chest Freezer
Before 1980	\$5,345	\$4,616	\$4,179	\$4,216	\$2,623
1980-89	\$3,845	\$3,278	\$3,007	\$3,232	\$2,007
1990-92	\$2,584	\$2,239	\$2,026	\$1,817	\$1,120
1993-2000	\$1,294	\$991	\$1,035	\$863	\$451
2001-2008	\$382	\$343	\$294	\$262	\$178
2009 Energy Star	\$0	\$0	\$0	\$0	\$0



Thank You.

Sean Skaling
Alaska Energy Authority
907-771-3079
sskaling@aidea.org

