



Renewable Energy Alaska Project

Founded in 2004, REAP is a statewide nonprofit coalition of over 80 electric utilities, Alaska Native Corporations, clean energy developers, businesses and other NGOs.

REAP's mission is to increase the development of renewable energy and promote energy efficiency in Alaska through **Collaboration, Education, Training & Advocacy**.

#### Behavioral Strategies K-12 Facilities Management





**The Ideal Classroom** 



# THWARTED BY HUMAN BEHAVIOR



	<b>Energy Literacy Principle</b>	S
1	Energy is a physical quantity that follows precise natural laws.	
2	Physical processes on Earth are the result of energy flow through the Earth system	$\mathbf{Q}$
3	Biological Processes depend on energy flow through the Earth System	1
[4	Various sources of energy can be used to power human activities, and often this energy must be transferred from source to destination.	洜
5	Energy decisions are influenced by economic, political, environmental, and social factors.	
6	The amount of energy used by human society depends on many factors.	
$\overline{7}$	The quality of life of individuals and societies is affected by energy choices.	

School districts in the United States spend approximately \$12 billion per year on energy bills with one-third of this amount being wasted due to inefficient building operation and **behaviors (DOE)**.

This line item can be the easiest to lower with the implementation of an effective *energy management program*. Further, an effective energy management program can significantly improve student and teacher performance by maintaining ideal learning room temperatures and improving indoor air quality. (EPA)

#### The 70/30 Mission: Quality Instruction for Alaskan Children

Studies by the EPA have found that the ideal temperature for learning is between 68 degrees and 74 degrees.

When temperatures fall out of this range, there appears to be a significant decrease in test score performance, approximately 14% to 18%.

Further, an additional EPA study finds that improved ventilation rates can improve test scores by approximately 15%.





#### **Research Finding Highlights:**

\$49 million in public dollars per year are spent on energy in the 67% of schools with available data.

On average, audited schools in Fairbanks used less than half the amount of energy for space heating per square foot than audited schools in other urban school districts when climate has been factored out.

Incentive systems for energy management appear to be one of the biggest factors in this difference.

The level to which valuing energy efficiency has been institutionalized and operational efficiencies have been maximized also are likely contributing factors to differences in overall school energy efficiency.





**Energy Management Policy:** 

An energy management program policy should drive much of the energy management decision making in a school district. An energy management policy is defined as having policies that direct facility maintenance and operations in temperature set-points, building occupancy hours, plug-loads and/or efficiency standards for equipment





The 10 largest schools had on average 3 employees supporting energy management programs, with 30% having no supporting staff. In total, over 50% of the reporting school districts did not have any supporting staff for energy management.











"With tight school budgets, large capital expenditures to improve or upgrade facility mechanical and lighting equipment is difficult.

The behavioral mechanisms considered were incentives, recognition, sanctions and notification. Both incentives and recognition have a more positive appeal and attempt to drive behavior with positive reinforcement.

Sanctions and notification focus more on penalizing those that were not complying with district energy management programs."





TARGET one or more specific behaviors that affect end users' energy use. They may address any of the broad arrays of energy-related behaviors including those that are infrequent or habitual; those that require purchases and those that do not; those that affect when energy is used; and those that relate to renewable energy generation.
Are rooted in SOCIAL SCIENCE RESEARCH. They rely on social science concepts that explain behavior to inform their design. These interventions may be used alone or in combination with traditional program interventions.
Consciously consider WHICH BEHAVIOR they will affect. Each intervention used in a program identifies one or more energy-related behaviors it aims to influence.
Yield EVALUABLE EFFECTS. They are implemented in a way that enables evaluation of quantifiable effects on energy-related behavior, both immediately after intervention and over time

## **The Social Economics of Behavioral Change**





Richard Thayer 2017 Nobel Prize Winner for Economics









# APPLIANCES in the CLASSROOM





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YUKON BOARD	OF EDUCATION P	OLICY CL	E-R
ENERGY M Yukon Public Schools I used for personal use st and other electric devic items such as refrigerat staff for additional use will require staff to pay will be audited during t on efficient energy of th program outlines will b	ANAGEMENT CONSERVATION – RI Energy Management personnel will audit devices i tes that consume resources. We are encouraging st tes that consume resources. We are encouraging st tes that consume resources. We are encouraging st the energy usage fee for that device if it is for person the energy usage fee for that device if it is for person the energy usage fee for that device if it is for person the outgoing. Written energy audits will be conduct te updated monthly. Cost per year for non-essential items	EGULATION in the buildings th fresheners, space aff to consolidate t requirement of c onal use devices v sonal use. Building p ted and conservati	hat are heaters tuse of charging which ng sites rincipal ion
Item	Description	Cost per Vear	
Refrigerator	Small college dorm type refrigerator 3.5 to 6 Cl	F \$50.00	
Microwave	Microwave in non-lounge area	\$50.00	
Air Freshener	Plug in air freshener (Not approved – wax or other scent electric pote	\$10.00 s)	
Coffee Pot	Coffee pot or hot water-tea pot in classroom areas	\$35.00	
Querry heatens	Emana hastam must be less than 1000 mette	0.000	





- If 20 teachers who swap out an old space heater for a low wattage foot warmer – their classes are eligible for a pizza party with the savings.
- Those classrooms with low/no plug loads are recognized by color code throughout the school.

Use Energy Savings to Fund a Schoolwide Celebration: A Day of Purging Classroom Appliances

Create Infographics that clearly demonstrate the cost of classroom appliances district wide in terms of funding new teaching positions.



- Incentivize: If 20 teachers take their refrigerators home – a new Energy Star refrigerator is installed in the teacher's lounge. And is cleaned by the janitorial staff twice a week.
- Social Pressure: Mini-fridge's must have tags that display the cost to the district per year.

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	There are many methods to distribute information and generate momentum within a school community. Examples from the exemplar schools include:
	CONSISTENT FEEDBACK Write thank you and "oops" notes for individual classrooms and offices during energy checkups. Clear, specific, appreciative feedback for faculty and staff is tremendously effective. Pre-printed notes can work if time is short.
	VISUAL RESULTS Compile results of checkups and audits, and share them in a chart or spreadsheet with those interested.
	PROMPTS AND REMINDERS Create "prompts" in the form of small, visual reminders that are placed for maximum impact to motivate new behavior. Good examples include stickers on switch plates to encourage lights out or reminders on printers to encourage turning them off at day's end. Making prompts can be another great opportunity to involve students' creativity.
	CLEAR ACTION STEPS Make checklists to share with classrooms and offices as guidelines for energy-conserving actions (see Figure 8, Appendix B).
	TIME-SENSITIVE GOALS Focus on "Power Down Fridays" and vacation shut-downs to highlight the extra savings available when schools are unoccupied.
	STUDENT INVOLVEMENT Help students create presentations about energy team findings for the school community, faculty or the school board or committee.
	SCHOOL-SPECIFIC SOLUTIONS Use your own creativity, and pull in the strategies that you know will work in your own school: posters, flyers, skits, faculty meetings, emails, morning announcements, bulletin boards, T-shirts, websites and more.



# An Alaskan Network of SCHOOL FACILITIES?

- APPA National School Plant Managers Association?
- Ed Connector?
- Facebook?
- Share SchoolDude/Maximo/ Strategies ?
- Green Janitor Training?
- ESCOs?



# SB-87

"An Act relating to energy efficiency standards and standardized options for building and equipment components for school construction and major maintenance; relating to school construction and major maintenance grants and bond debt reimbursement; establishing a working group to make recommendations relating to energy efficiency and standardized components in schools; and providing for an effective date."

#### What's In the SB-87

- Commissioning
- Life Cycle Cost Analysis
- Design Awards
- Reviewing Minimum Energy Efficiency Standards
- Shared Maintenance and Support Team Model
- Shared Space
- Working Group

#### Anyone Missing from this Working Group?

- (1) one member from the Department of Education and Early Development
- (2) one member from the Alaska Housing Finance Corporation;
- (3) one member from the Alaska Energy Authority;
- (4) one member from the Cold Climate Housing Research Center;
- (5) one member from the Department of Transportation and Public Facilities
- (6) a superintendent from a rural public school;
- (7) a superintendent from an urban public school;

(8) two members from the construction industry, one with expertise in 13 construction in urban areas and one with expertise in construction in rural areas.

## Thank You!

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