February 2010

REEL in Alaska ROADMAP*

How to meet end-use electricity needs in the Railbelt region in 2025, using half the electricity used in 2000.

*"REEL" = Railbelt Electricity Efficiency Landscape

[This page intentionally left blank.]

TABLE OF CONTENTS

About Natural Capitalism Solutions 1

Preface 2

Executive Summary 4

REEL in Alaska Recommendations 7
1. Set a goal to reduce railbelt electricity use by 50% by 2025.
2. Implement the RIRP recommendation for a baseline, end-use study.
3. Form a Railbelt regional authority for energy efficiency
4. Provide statewide legislation to enable property-based financing and other incentives for energy efficiency and renewable energy.
5. Additional Next Steps……..... 8
   a. Implement the State Energy Policy and Programs Recommendations.
   b. Organize and Implement "Social Mobilization."

Overview..... 9

REEL in Alaska Roadmap Details 16
1. Starting Point 17
2. Landmarks 19
3. Financing 20
4. Policy 24

Destination: 50% Improvement in Efficiency 26
Regional Authority 27

Business Case for Electricity Efficiency 29

Electricity Efficiency Actions in Alaska 35
Existing, Utility-Sponsored Programs 40

Implementation Strategies..... 42
Landmarks 42
Smart Grid..... 57
Financing 59
Decoupling—“Bills Not Rates”… 70
Policy And Programs 88
The Importance of Local and Regional Mobilization 92

Conclusion..... 95

Appendix A: Existing Alaska Energy Efficiency Resources
Appendix B: State Resources and Energy Committee Recommendations
Appendix C: SMUD Sample Policy Document and Energy Efficiency Program Description
Appendix D: Boulder Colorado ClimateSmart Approved Efficiency Measures
Appendix E: Railbelt Utility Contacts
Appendix F: Sample End-Use Survey—Canada SHEU
Appendix G: Sample Technologies
Appendix H: Profile of the Railbelt Region

Acknowledgments

This ***REEL in Alaska Roadmap*** was prepared by the Alaska Conservation Alliance, for Alaska policymakers, with funding from Alaska Conservation Foundation. Natural Capitalism Solutions provided technical assistance and support. Elizabeth Outten, of the Alaska Conservation Alliance was the Project Coordinator, with research and writing assistance from Paul Sheldon and Emily Evans, of Natural Capitalism Solutions. The idea for this ***Roadmap*** emerged from conversations Matt Rafferty of Alaska Conservation Foundation held with L. Hunter Lovins and Paul Sheldon of Natural Capitalism Solutions.

Although every possible effort has been made to present information accurately, the opinions and recommendations contained in this report are the those of the authors, and should not be taken as a reflection on the good work done by others whose literature is cited herein. Any inadvertent inaccuracies or inconsistencies with prior work cited herein unintentional, and are the sole responsibility of the authors.

The ***REEL in Alaska Roadmap*** builds on previous work and publications completed by the Cold Climate Housing Research Center, the Alaska Energy Authority, the Alaska Housing Finance Authority, the Institute of Social and Economic Research at the University of Alaska Anchorage, Renewable Energy Alaska Project (REAP), the Alaska Legislature, Black & Veatch, the six Railbelt utilities, and dozens of others, without whom this ***Roadmap*** would not have been possible, and to whom the authors express their gratitude.

The authors express thanks to L. Hunter Lovins, Jeff Hohensee, Toby Russell, Nancy Johnston, Margo Boteilho, Robert Noiles, Tim Morzel, Jeffrey Wilzbacher, Adrienne Kmetz Fuller, Christopher Eichenauer, Alexander Kent, Josh Kruger, Nick Sterling, and Lily Thaisz from Natural Capitalism, whose diligent research and support made this ***Roadmap*** possible.

A draft version of this document was reviewed by a diverse group of stakeholders and peers. The authors particularly express their gratitude to the Chugach Electric group led by Dave Smith for their thorough review and suggestions, as well as and Lorali Carter at Matanuska Electric Association, and also to Jeremy Fisher and Chris James at Synapse Energy Economics, Shelley Morgan of Senator Bill Wielechowski's office, Katie Conway and Sean Skaling of AEA, Kevin Harper at Black & Veatch, Chris Rose of Renewable Energy Alaska Project, Tim Leach, Jessie Peterson, Pat Lavin, Jim Sykes, Brian Hirsch of NREL, and Antoinette Stein.

Many additional individuals and organizations graciously joined Elizabeth Outten and Jeff Hohensee at local sessions around the Railbelt region as well as participating in subsequent conversations with the authors, including (but not limited to) Senator Johnny Ellis and Matthew Moser, Senator Joe Thomas, John Davies of CCHRC, Rick Sieffert of UAS Cooperative Extension, Scott Waterman and Bob Ferguson of AHFC, Dan Fitzgerald, Bill Popp, Chris Calwell of Ecos, Ralph Cavanagh at NRDC, Michael Barber, Chris Rose of REAP.

Special thanks are due to Business Liaison Wendy Kahler, U.S. Ambassador Bruce and Mrs. Cody Douglas Oreck, of the U.S. Embassy in Helsinki, and to Mr. Jouko Kinnunen, Managing Director of Motiva Oy, for their assistance in obtaining information on energy efficiency policies and programs in Finland.

About Natural Capitalism Solutions

Natural Capitalism Solutions helps companies, countries, and communities implement genuine sustainability. In 2007 and 2008, Natural Capitalism Solutions worked with clients representing approximately 3% of U.S. Gross Domestic Product.

Natural Capitalism Solutions was founded on the three principles of Natural Capitalism, which form the basis for the transition to genuine sustainability. These principles describe how businesses and communities can shift from unsustainable to more sustainable, restorative practices adopting policies and programs to:

- ***Increase efficiency:*** *Dramatically increasing the productivity of resources, including energy, water, materials, and people. This slows resource depletion, lessens pollution, and increases employment in meaningful jobs. It lowers costs for business and society, halts the degradation of the biosphere, makes it more profitable to employ people, and preserves vital living systems and social cohesion.*
- ***Redesign industrial processes and the delivery of products and services to do business as nature does, using such approaches as biomimicry and cradle to cradle:*** *Using innovative green processes to eliminate waste and toxics, while delivering superior products and services. This approach enables a wide array of materials to be produced with low energy flows, in processes that run on sunlight, emulating nature's genius. It shifts to circular economies in which materials are reused, remanufactured and waste is eliminated.*
- ***Manage institutions to be restorative of human and natural capital:*** *Restoring and enhancing natural and human capital resources, while increasing profitability and competitive advantage. Such approaches enhance human well-being and enable the biosphere to produce more wealth from its intact communities and abundant ecosystem services and natural resources.*

Natural Capitalism Solutions is recognized internationally for its work in the field of sustainability. Formed by Hunter Lovins, co-author of the acclaimed book Natural Capitalism: Creating the Next Industrial Revolution, Natural Capitalism Solutions is led by Lovins, Toby Russell and Paul Sheldon, who have a combined total experience of over 80 years in business, sustainability and communications. Together with their network of best in class sustainability professionals, the Natural Capitalism staff has an impressive record in developing innovative and practical ways to increase efficiency and environmental practices, as well as economic sustainability, for a long list of government and corporate clients.

Natural Capitalism Solutions' mission is to educate senior decision-makers in business, government and civil society about the principles of sustainability. Natural Capitalism Solutions shows how to restore and further enhance natural and human capital while increasing prosperity and quality of life. In partnership with leading thinkers and groups, Natural Capitalism Solutions creates innovative, practical tools and implementation strategies for companies, communities and countries. Natural Capitalism Solutions (NCS) is a 501(c)(3) non-profit organization.

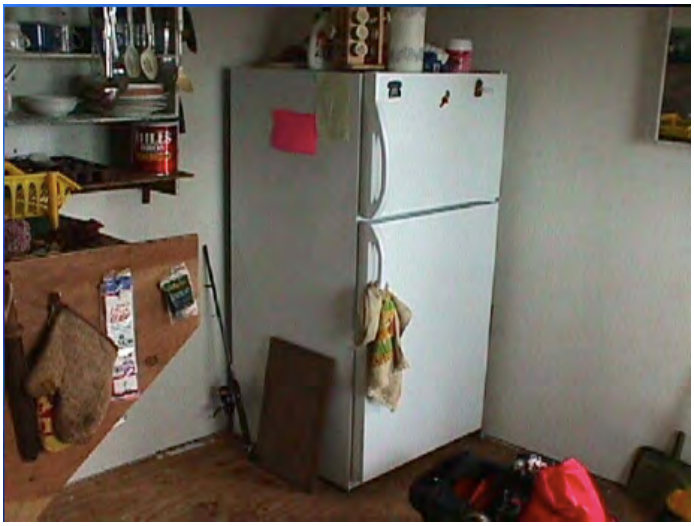
http://www.natcapsolutions.org

Preface

As noted in the Profile in Appendix H, 65% of Alaskans live in the Railbelt region around Anchorage, Homer and Fairbanks—approximately 477,000 people.[1,2] The Railbelt region is currently served by six separate electricity utilities, who collaborate on a shared transmission and distribution network providing over 4 thousand megawatt hours (MWh) of electricity each year:

Chugach Electric Association (CEA)	1,112 MWh
Municipal Light & Power (ML&P)	880 MWh
Matanuska Electric Association (MEA)	532 MWh
Homer Electric Association (HEA)	477 MWh
Seward Electrical Systems (SES)	55 MWh
Golden Valley Electric Association (GVEA)	1,071 MWh
Railbelt Region	**4,127 MWh**

These six Railbelt utilities and many other locally-based organizations provide outstanding resources for ways that Alaskans can more efficiently meet their electricity needs for light, heat, entertainment, pumps, motors, and other services. For example, the Alaska Housing Finance Corporation (AHFC) helped one Alaskan family replace a refrigerator that used more than 1,300 kilowatt hours (kWh) per year, with one that uses 437 kWh per year, producing a savings of at least 863 kWh—an improvement in efficiency of at least 66%. At a price of $0.215/kWh for electricity, this saves the owner $186 per year, which will provide a positive return on investment in just a few years.



Although some very useful examples of Alaskan opportunities such as the one above will be cited in this ***Roadmap***, much of the information and many of the examples contained in this ***REEL in Alaska Roadmap*** come from outside of Alaska, simply because Alaska-specific information isn't available yet. Similarly, many examples provide statistics for one house, one business, or one project, rather than a whole community or service area. This is because many of the strategies described here have been implemented on a scale large enough to demonstrate feasibility, profitability, and cost effectiveness, but not

[1] Alaska Energy Authority and Alaska Center for Energy and Power. *Alaska Energy.* Alaska Energy Authority. January 2009. http://www.aidea.org/aea/PDFpercent20files/AKpercent20Energypercent20Final.pdf.

[2] U.S. Census Bureau. *Alaska.* State & County QuickFacts. September 2009. http://quickfacts.census.gov/qfd/states/02000.html.

on a community-wide or utility-wide basis yet. Nonetheless, the examples provide indications of the viability of the various strategies and technologies described.

The authors of this ***Roadmap*** sincerely hope that Alaskans will find this additional "outside" information useful in charting a course to a sustainable energy future—a future based on the abundance, independence, prosperity, and resilience that have always been the basis for Alaska's greatness.

This scope of this ***Roadmap*** is electricity use in the Railbelt region. As such, the ***Roadmap*** does not address energy used for thermal heating or for transportation, except as these services require electricity. Though very important to Alaska's energy future, renewable energy technologies and supply sources are also outside the scope of this ***Roadmap****.*

Alaska already has numerous local resources to empower and support her citizens in improving the efficiency with which electricity is used. In the *Alaska Energy Efficiency Program and Policy Recommendations Report* of June 5, 2008, the Cold Climate Housing Research Center provided a brief list of some of the organizations with expertise in how to use electricity more efficiently, which is included in this ***Roadmap*** as Appendix A.

Including the existing Railbelt utilities, many of these Alaska-based organizations are non-profit, Alaska-based groups that exist to serve the community. The actions taken by these groups directly reflect the interests of the community members involved and serve as examples of how Alaskans can help themselves, without heavy reliance on outside groups, corporations, or strong government intervention.

Executive Summary

Alaska remains a land of incredible opportunity and potential—Alaska's relatively small population—the frontier—the "can-do" spirit that makes incredible things happen (e.g. the Alaska oil pipeline, the Alaska Highway, Iditarod)—Alaska's world-class understanding of energy, thanks to the oil and gas industry—the dedicated men and women of Alaska's existing infrastructure, who have made life on the frontier possible for so many years—all combine to provide unprecedented possibility for abundance and prosperity.

This ***REEL in Alaska Roadmap*** demonstrates how Alaskans in the Railbelt region can meet their real electricity needs, with up to 50% greater efficiency in the use of electricity from centralized generation, by 2025 (as compared to the year 2000).

Setting a destination of improving efficiency by potentially as much as 50% represents an improvement of 3.3% per year over the next 15 years, which has been shown to be achievable through harvesting "low-hanging fruit"—a combination of market-based incentives and clearly-stated policies, backed by appropriate and affordable financing, for improvements in lighting, heating, ventilation, appliances, machines, and infrastructure. Sections of this ***Roadmap*** address each of these opportunities.

One example of this opportunity is Anchorage's transition to LED street lighting, which uses 50% less electricity already. The program is saving Anchorage $360,000 per year, for only $2.2 million invested. Anchorage will start receiving profits on their investment in approximately 6 years. If these new streetlights last 15 years, this investment will yield an annual monetary return rate of 9.3%, between 2010 and 2025, while improving efficiency by 50%.[3]

This annual overall efficiency improvement level of 3.3% per year is less than what has been accomplished elsewhere: Vermont will achieve 4% improvement in its energy efficiency in 2010, for an investment of less than $0.03 per kWh of improved efficiency[4]; Houston reduced electricity use for traffic lights by 90% in one year, by installing LED traffic signals[5]; and Taiwan plans to improve overall electricity efficiency by 60%, and has achieved up to 85% improvement on the electricity used for traffic lights by switching to LEDs.[6]

---

[3] *Anchorage leads the country with innovative and aggressive lighting program*, press release from Anchorage Mayor's Office, 10/31/2008, viewed December 23, 2009 at http://www.muni.org/Departments/Mayor/PressReleases/Pages/CITYINSTALLSFIRSTOF16,000LEDSTREETLIGHTS.aspx.

[4] *Efficiency Vermont Annual Plan 2009-2011*, December 16, 2008, downloaded December 25, 2009, from http://www.efficiencyvermont.org/stella/filelib/EVT%20Annual%20Plan%202009-2011.pdf

[5] *The City of Houston's Path Towards Sustainable Growth,* September, 2009. Viewed December 23, 2009, at www.greenhoustontx.gov/epr/sustainablegrowth2009.ppt.

[6] Huang, Vicki, 2009. *Green Light: Energy conservation measures focusing on more efficient lighting are seeing results.* Taiwan Review, viewed January 8, 2010, at http://taiwanreview.nat.gov.tw/fp.asp?xItem=53226&ctNode=1355

Furthermore, energy efficiency improvements are not new. In 1999, six states, some of which are rural, cold weather states, improved their electricity efficiency by 4% or more, as a percentage of total electricity sold in 1998 (the six states that reported at least 4% savings as a fraction of sales in 1998 were Washington, Oregon, Wisconsin, Rhode Island, Minnesota, and Vermont).[7]

What kind of lighting is in use where you are, right now? Is it daylight? If not, is it from solid-state, LED technology? Compact fluorescents? Fluorescent tubes? Incandescent bulbs? Firelight?

The urgent question is, "Could the efficiency of this use of electricity be improved by 3.3% this year?" If the answer to this question is yes and if Alaskans take the opportunity to ask and implement efficiency improvements every year, up to a 50% improvement is possible by 2025.

Obviously, there are some opportunities to improve efficiency by more than 3%, such as 75% or 90% improvements, as discussed in this ***Roadmap***. These dramatic examples of "low-hanging fruit" make the journey to a destination of as much as 50% improvement by 2025 much more achievable. However, a thorough, baseline assessment of current end uses of electricity in the Railbelt region will be required to determine the actual potential for improved efficiency. For example CEA has measured that overall electricity usage DECREASED by 5% between 2004 and 2009, bringing overall usage to the same levels as in 2002. By selecting a year 2000 baseline, this ***Roadmap*** intends to include these historic gains in efficiency. The baseline, end-use study is necessary to determine whether these recent decreases are the result of changing behavior patterns, or if, perhaps, some of the "low-hanging fruit" of energy efficiency, such as installing CFLs, has already been harvested, and in which areas. Also, once a new, Railbelt-specific baseline is available, the overall goal for energy efficiency in the year 2025 can refer to the new baseline, e.g. 2010.

Energy efficiency does not mean freezing in the dark. Energy efficiency does not mean doing without. It does not mean having less than Alaskans want or need. Energy efficiency, done right, results in spending less money to provide increased levels of service—providing the services Alaskans need, in affordable, and efficient ways, with no sacrifice in convenience, comfort, or affluence. This is the difference between energy efficiency and "conservation."

A 50% improvement in the Railbelt's electricity efficiency could generate an increase of up to $947,992,100 in economic output, $290,927,800 in wages, $53,499,850 in business income, and 9,350 new jobs.[8]

By 2025, Alaska's Railbelt region can meet its end use needs using potentially as little as 50% of the electricity from centralized generation previously required in the year 2000.

---

[7] ACEEE, *State Scorecard on Energy Efficiency,* April, 2000. Viewed December 24, 2009 at http://www.aceee.org/pubs/u004.htm.

[8] Based on reducing demand by up to 425MW through efficiency. ECONorthwest, *Economic Impact Analysis of Energy Trust of Oregon Program Activities.* 2003, Table 9. http://www.energytrust.org/library/reports/ETOecon_impacts_Final.pdf?link_programs_reports_lin1Page=3.

REEL in Alaska Roadmap

1. **STARTING POINT (baseline assessment of end-uses of electricity)**

2. **LANDMARKS—Lighting, Heating/Ventilation, and Plug-in Appliances**

END USE	**ANNUAL IMPROVEMENT** (as % of total electricity use)	**TOTAL BY 2025**
Lighting	1.3%	20%
Heating & Ventilation	1%	15%
Plug-in Appliances	1%	15%
TOTAL	**3.3%**	**50%**
BONUS: Smart Grid	**BONUS** 1.3%	**BONUS** 20%

3. **FINANCING**
   a. Decoupling efficiency from kWh sold – “bills not rates”
   b. Protecting utility margins
   c. Repayment of financing tied to property
   d. On-bill financing
   e. Addressing split landlord/tenant incentives

4. **POLICY**
   a. Policies designed to support voluntary, free-market solutions
   b. Mandatory security provisions to ensure stability and equity
   c. Leveraging public resources to increase benefits

REEL in Alaska Recommendations

1. **Set a goal to reduce Railbelt region electricity use from fossil fuels, by 50% by 2025, through efficiency improvements.**
   - In coordination with Governor Palin's goal of 50% renewable energy, this could enable the Railbelt region to meet all its energy needs from renewable sources, while bringing additional jobs and savings.[9]

2. **Implement the RIRP recommendation for a baseline, end-use study of electricity uses.**

   As stated in the Alaska Energy Authority's draft Alaska Railbelt Regional Integrated Resource Plan, "… it is important that a comprehensive technical and achievable potential study be completed, including the comprehensive cost-effectiveness evaluation of the available DSM/EE [energy efficiency] measures and using Railbelt-specific information." [10,11]

3. **Form a Railbelt regional authority for energy efficiency to serve as an energy efficiency utility, as recommended by prior reports, to improve the efficiency of lighting, heating, plug-in appliances and other electricity uses in residential, commercial, institutional, and industrial sectors.**

   "… it is Black & Veatch's belief that a regional entity should be formed to develop and deliver DSM/EE programs on a regional basis, in close coordination with the six Railbelt utilities. This entity could be the proposed GRETC organization or another entity focused exclusively on DSM/EE programs."[12]

4. **Provide statewide legislation to enable property-based financing and other incentives for energy efficiency and renewable energy.**
   - See the Implementation Strategies section, below.
   - Sample legislation from Colorado is available at the following website:
     - http://www.newrules.org/energy/rules/municipal-financing-renewables-and-efficiency
   - Support additional revenue from financing and accomplishing energy efficiency and distributed renewable energy projects, through strategies such as dynamic pricing, time of use rates, inverted block rates, net metering, and feed-in tariffs.

---

[9] For example, California's commitment to energy efficiency has kept per-capita energy use flat for more than 30 years, while their economy has grown. Energy efficiency measures have enabled California households to redirect their expenditure toward other goods and services, creating about 1.5 million FTE jobs with a total payroll of over $45 billion, driven by well-documented household energy savings of $56 billion from 1972-2006. See Roland-Horst, David, *Energy Efficiency, Innovation, and Job Creation in California*, 2008, published by Next 10 and available for download from http://www.Next10.org.

[10] Black and Veatch, *Alaska Railbelt Regional Integrated Resource Plan (RIRP) Study Draft Report.* December 2009. Page 11-16. (DMS/EE stands for "demand side management/energy efficiency). More information on DSM/EE is contained, below, in this *REEL in Alaska* Roadmap.

[11] Though no such end-use baseline studies exist in Alaska yet, an example of an end-use baseline study for lighting is available at: http://www.energy.ca.gov/efficiency/lighting/VOLUME01.PDF; and Canada's Survey of Household Energy Use is included in this *Roadmap* as Appendix F.

[12] Black and Veatch, RIRP, 2009, op. cit. Additional information on DSM/EE is contained, in this *REEL in Alaska* Roadmap.

5. **Additional Next Steps:**
    a. **Implement the State Energy Policy and Programs Recommendations.** In October 2009, the State Senate Resources and Energy Committees recommended a specific list of actions to improve Alaska's energy efficiency, many of which are also paralleled by proposals in the House.[13] All of the recommendations of the Senate Committees' report are consistent with the ***Roadmap***. The full Senate Committees' report is included in this ***Roadmap*** as Appendix B.
    b. **Organize and Implement "Social Mobilization" for Energy Efficiency.** (See "The Importance of Local and Regional Mobilization," page 92.)

[13] Wielechowski, Bill and Lesil McGuire, *State Energy Policy and Program Recommendations,* October 19, 2009. Viewed December 29, 2009 at http://www.aksenate.org/energy/101909_Draft_E_policies.pdf

Overview

The primary goals of providing energy services are survival, comfort, prosperity, and stability. This Railbelt Electricity Efficiency Landscape in Alaska ("***REEL in Alaska***") ***Roadmap*** demonstrates how the Railbelt region can increase the efficiency with which people's end-use needs are met by as much as 50%, by 2025, as measured against the amount of electricity used to meet those needs in 2000.

When considering efficiency improvements, the most important question to ask is, "What are we using the electricity for?" Or, "What are the **end-use needs** for which we need energy?"

Too often, planners seek to increase energy supply, without asking about the most efficient and appropriate ways to meet **end-use needs**. For example, sometimes people think they need more supply—because they don't have enough electricity to produce light using incandescent bulbs—when the most cost-effective way to meet the **end-use need** for lighting is to replace the inefficient, incandescent bulbs with solid state lighting technologies, like light emitting diodes (LEDs), as Anchorage is doing with its street lights.

As documented below, some returns on investments in improved efficiency include:

- Saving money for residents, businesses, institutions, industries, and utilities;
- Creating new jobs for hard-working Alaskans;
- Increasing regional energy security;
- Reducing exposure to volatile prices of fossil fuels; and
- Increasing regional prosperity and "economic multiplier" by freeing up money spent on electricity for other uses.

The 50% destination used for this ***Roadmap*** is a method to move past conventional thinking—to drive breakthroughs that will lead to greater prosperity, by achieving an incremental improvement of just 3.3% per year.

Alaskans are already working on a wide variety of energy efficiency activities and programs. The ***REEL in Alaska Roadmap*** both builds on these accomplishments, and counts on Alaskans' expertise, to determine and implement next steps. In addition to these outstanding accomplishments, the ***REEL in Alaska Roadmap***'s recommendations are based on other examples that have been demonstrated to work elsewhere, and which may also work in Alaska.

In an economy in which stocks are falling and investments are not made on a whim, investing in electricity efficiency is currently one of the safest investments. Energy efficiency investments (including thermal and electricity) have a high rate of return. In 2009, "Energy efficiency recorded the highest investment returns… at 30%, followed by carbon finance at 24%."[14]

---

[14] Chestney, Nina. *World climate business revenue $2 trillion by 2020: HSBC*. Reuters. 2009. http://www.reuters.com/article/GCA-GreenBusiness/idUSTRE58H2FM20090918.

Similarly, McKinsey states that by investing up to $520 billion in energy efficiency improvements the United States could save up to $1.2 trillion by 2020.[15] These efficiency improvements include approaches such as lighting retrofits, heating and ventilation upgrades, and ENERGY STAR appliances and equipment. Figure 1, below, shows examples of investments in various energy efficiency improvements versus energy saved. ALL of the improvements shown are cost effective in today's dollars, and pay back in less than 10 years.

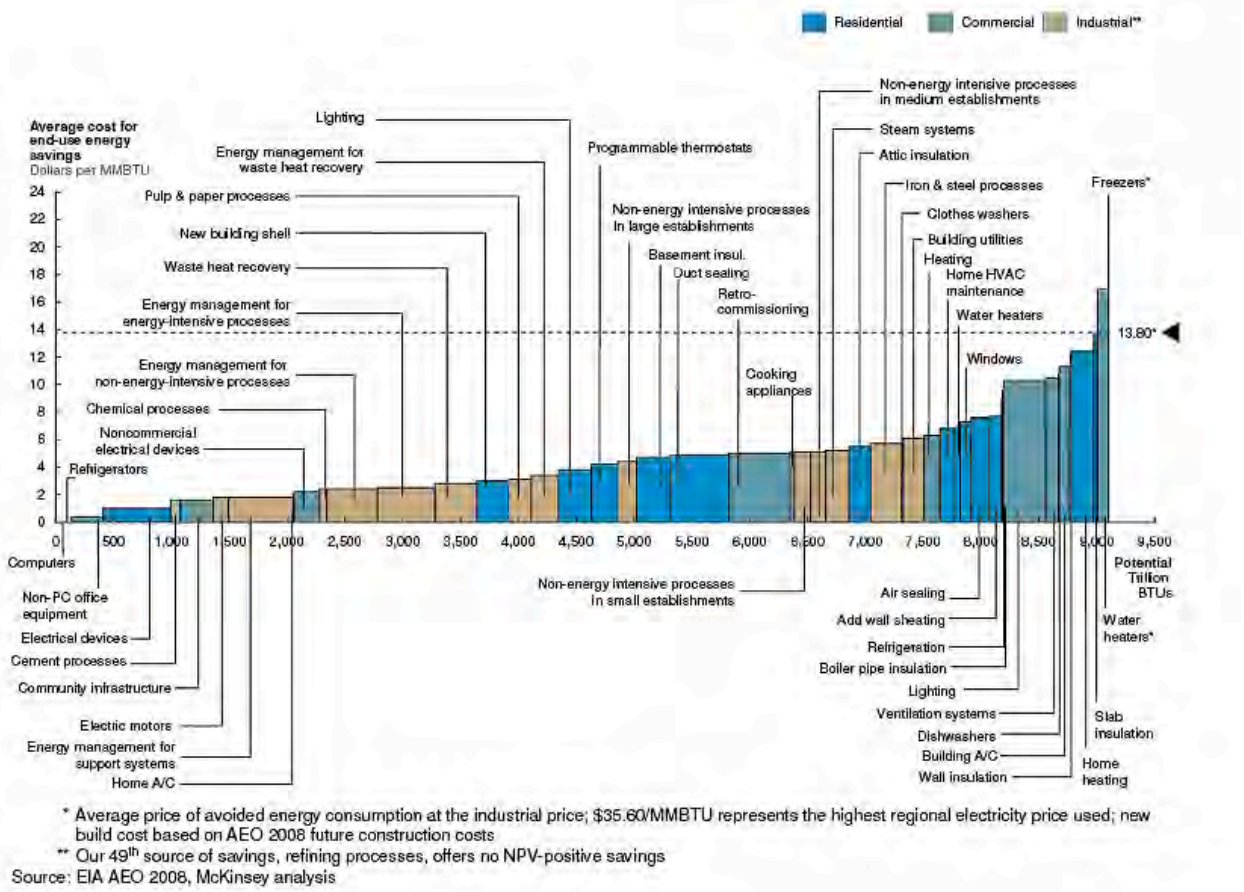


Figure 1. McKinsey Analysis on Savings From Energy Efficiency.[16]

In reference to the Alaska State Senate Resources and Energy Committees' recent report,[17] Senator Lesil McGuire said, "The recommendations focus on improving energy efficiency, among many other strategies. Increasing efficiency is a way to cut costs without compromising comfort or productivity. Energy efficiency is a way to do the same or more with less, to use energy smartly."[18]

---

[15] Galbraith, Kate. *McKinsey Report Cites $1.2 Trillion in Potential Savings from Energy Efficiency.* New York Times. 29 July 2009. http://greeninc.blogs.nytimes.com/2009/07/29/mckinsey-report-cites-12-trillion-in-potential-savings-from-energy-efficiency/.

[16] Though this chart is difficult to read in this form, the original is slightly more legible, ibid.

[17] Wielechowski and McGuire, op. cit.

[18] Alaska State Legislation. Senators Release Energy Recommendations: Call for Investments in Energy Efficiency, Renewable Energy and More Oil and Gas Development. 19 October 2009. http://www.aksenate.org/index.php?compress_id=417.

REEL in Alaska Roadmap

1. **STARTING POINT—baseline assessment of end-uses of electricity**

2. **LANDMARKS—Lighting, Heating/Ventilation, and Plug-in Appliances**

3. **FINANCING**
    a. Decoupling efficiency from kWh sold—“bills not rates”
    b. Protecting utility margins
    c. Repayment of financing tied to property
    d. On-bill financing
    e. Addressing split landlord/tenant incentives

4. **POLICY**
    a. Policies designed to support voluntary, free-market solutions
    b. Mandatory security provisions to ensure stability and equity
    c. Leveraging public resources to increase benefits

Starting Point—Baseline End-Use Study

As noted throughout this ***Roadmap***, there is a conspicuous absence of accurate information about the ways Alaskans currently use electricity in the Railbelt Region. Before any comprehensive attempt to improve efficiency can be undertaken, it will be necessary to complete a thorough study of existing end-uses of electricity.[19]

Focus on End-Uses—Lighting, Heating, Appliances

The fundamental value on which this ***Roadmap*** is based is **meeting Alaska's end-use needs. End-use needs** are the services provided by electricity, such as indoor task lighting, outdoor lighting, warm houses, and plug-in appliances (like TVs, refrigerators, washers, dryers, game consoles, cable TV set top boxes, satellite dishes, computers, printers, battery chargers, and industrial machinery), all of which can be at least 30% to 50% more efficient, using currently-available, cost-effective technologies.

Electric utilities were formed to provide electricity and also to meet rate-based revenue goals. This ***Roadmap*** proposes an expanded role for Alaska's Railbelt utilities—expanded to include meeting **end-use needs,** by additional means beyond merely generating, transmitting, and selling electricity. In essence, this means that the Railbelt utilities can become providers of services like light and warmth in efficient ways, some of which require less, not more electricity, as shown by the programs sponsored by the Alaska Housing and Finance Corporation.

Alaskans need services like light, heat, entertainment, pumping, and industrial shaft power. Providing for these needs, in efficient, stable, cost-effective ways will provide known opportunities for economic growth and development beyond merely generating and transmitting more electricity.

[19] See the *REEL in Alaska Roadmap* Details section, below, for additional information and resources relating to end use surveys.

Regional Authority

This *REEL in Alaska Roadmap* endorses Black & Veatch's REGA and RIRP recommendations regarding the benefits of a "comprehensive technical and achievable potential study," as well as formation of a regional authority.

The Alaska Energy Authority commissioned Black & Veatch to "Identify and assess a list of options for the management, operation, access rules, ownership, resource planning, and regulatory structures of the Railbelt generation and transmission system." In their Final Report, aptly titled "Alaska Railbelt Electrical Grid Authority (REGA) Study," Black and Veatch recommended creation of a regional energy authority, to provide comprehensive approaches to energy supply and efficiency improvements. This "REGA" concept has also been introduced in the Alaska Legislature as "GRETC" or "Greater Railbelt Energy & Transmission Corporation."[20] Both of these strategies would also include efficiency improvements and renewable sources of energy.

In the follow-up draft Regional Integrated Resource Plan (RIRP), Black and Veatch further noted:

> First, it is important that a comprehensive technical and achievable potential study be completed, including the comprehensive cost-effectiveness evaluation of the available DSM/EE [energy efficiency] measures and using Railbelt-specific information. …Second, it is Black & Veatch's belief that a regional entity should be formed to develop and deliver DSM/EE programs on a regional basis, in close coordination with the six Railbelt utilities. This entity could be the proposed GRETC organization or another entity focused exclusively on DSM/EE programs.[21]

Whether the REGA/GRETC entity is a State run organization, a utility/community co-operative, or an independent corporation, the process of meeting the Railbelt's **end-use needs** will be harmonized by combining the generation, and transmission efforts of all utilities into one authority, which can also promote efficiency improvements and distributed, renewable sources of supply. While it might also seem beneficial to constitute the energy efficiency authority as a distinct entity—an "energy efficiency utility," such as those in Oregon and Vermont, the relatively small size of the Railbelt population, as well as the need to carefully coordinate supply, transmission, and end-use needs make it likely that generation, transmission, and meeting end-use needs through efficiency and distributed sources of generation should all be consolidated under one, regional authority.

---

[20] To see Black & Veatch's REGA recommendations please refer to the report at: http://www.aidea.org/aea/REGAFiles/9-12-08_AlaskaRailbeltREGAStudy_MasterFinalReport.pdf.

[21] Black and Veatch, *Alaska Railbelt Regional Integrated Resource Plan (RIRP) Study Draft Report.* December 2009. Page 11-16. "DMS/EE stands for "demand side management/energy efficiency." More information on DSM/EE is contained, below, in this *REEL in Alaska* Roadmap.

Energy Efficiency Utilities

To be truly effective, the REGA/GRETC authority must also function as an "energy efficiency utility." Even if the legislature chooses not to implement a regional authority, it would still be advantageous to create a statewide or regional energy efficiency utility. In most areas that are developing them, energy efficiency utilities are funded by a fee on utility bills or by private or public investors, such as the $0.01/kWh "consumer benefits surcharge" recommended in AEA's draft RIRP.[22] These organizations work to provide low-to-no cost energy efficiency services for communities. Most of the early energy efficiency utilities are non-profit organizations, but as the return on investment for energy efficiency improvements becomes more recognized within the finance community, it is likely that structures similar to today's investor-owned utilities will also become viable. For Alaska's Railbelt region, the non-profit model seems compatible with the existing utility structure, and could easily be included in the organizational structure of a regional authority.

Energy Efficiency Utilities are emerging as a strategy to reduce peak load and overall demand, while engaging the community and educating consumers, through efficiency incentives and programs throughout their service territories. Organizations like the Energy Trust of Oregon and Efficiency Vermont improve efficiency through an approach similar to Demand Side Management ("DSM" which is described later in this ***Roadmap***).

Efficiency Vermont was formed in 2000, as a not-for-profit entity under contract with the Vermont Energy Investment Corporation. Funded by a 4.5% fee on consumers' electricity bills. By contrast the consumer benefits surcharge recommended by AEA in the draft RIRP is $0.01/kWh, which would be 10% of $0.10/kWh.[23] Efficiency Vermont has helped almost 60% of Vermont's customers since its formation, and is the first such entity to reduce annual load growth by 1.8% through efficiency measures alone. In 2009, Vermont will reduce its overall electricity consumption by 3%, and is projected to reach 4% overall reduction in 2010.[24] Unlike the early days of DSM, where conservation was touted as the best strategy, energy efficiency utilities offer free services that will increase the efficiency of meeting end use needs for electricity, without sacrificing comfort or affordability. These include free energy audits, technical advice, and sometimes subsidizing the cost of equipment such as improved lighting, efficient appliances, insulation, new water heaters, furnaces, or windows.[25]

Delaware has begun the most ambitious energy efficiency utility to date: Delaware's Sustainable Energy Utility (SEU) aims to improve the efficiency of all fuel consumption in the residential, business and transportation sectors by one-third by 2015. Delaware will fund SEU through a 36-cent surcharge on each utility bill each month, as well as a $30 million private bond issue. This "sustainable energy" bond will NOT be guaranteed by

---

[22] Black & Veatch, 2009. Op. cit., pp. 40 and 227.
[23] Ibid.
[24] Efficiency Vermont, 2008. Op. cit.
[25] Chang, Susan. "The Rise of the Energy Efficiency Utility." Institute of Electronics and Electronics Engineers, May 7, 2008. http://spectrum.ieee.org/green-tech/conservation/the-rise-of-the-energy-efficiency-utility.