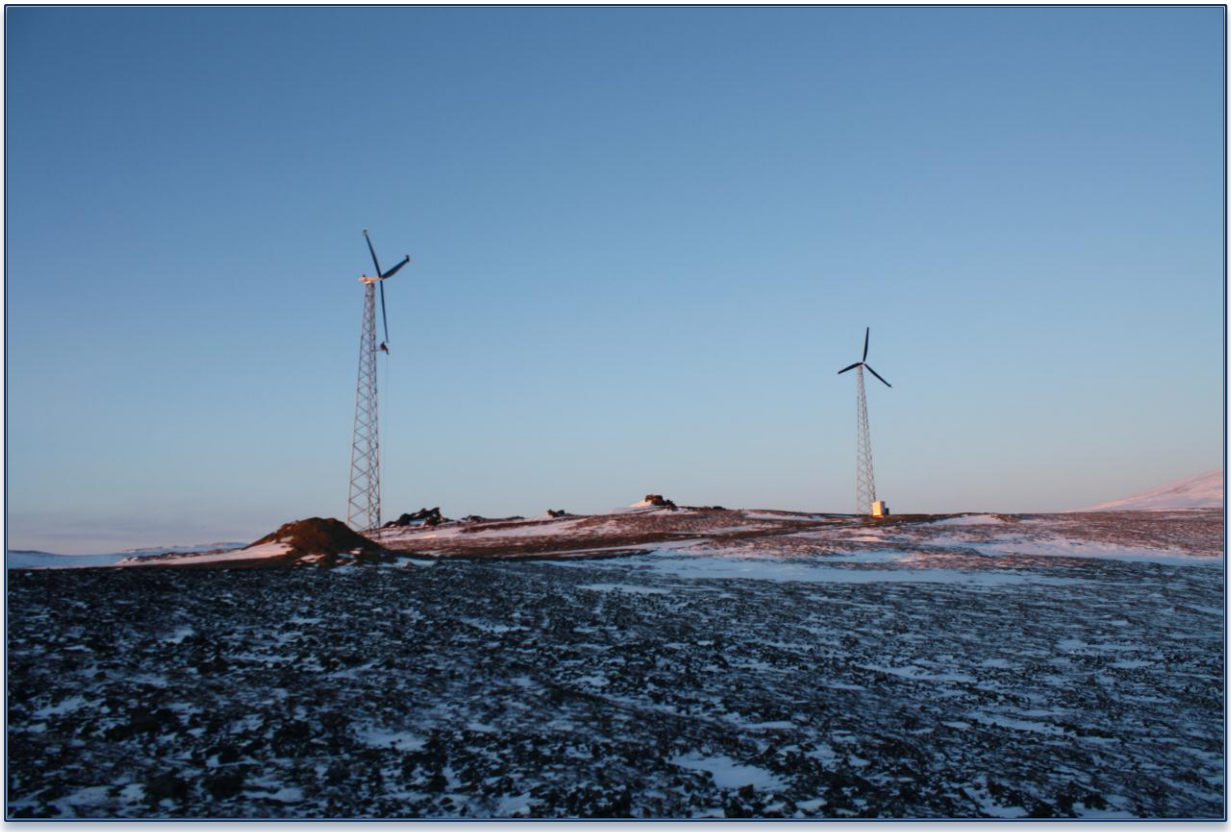
ALASKA DEPARTMENT OF LABOR
& WORKFORCE DEVELOPMENT

Alaska State Energy Sector Partnership
and
Alaska Workforce Investment Board



Renewable Energy and Energy Efficiency Workforce Development Plan

DRAFT 9-18-2012

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A. Executive Summary

Alaska's energy needs and opportunities are as varied as its geography. With skyrocketing energy costs, especially in Bush/Rural Alaska, it is critical that the State of Alaska optimize community and village-scale energy systems in order to stabilize energy prices and create job opportunities across the state. The significant growth of the energy sector economy in Alaska requires that the state also make investments in job training so that Alaskans can fill the jobs that are being created in renewable energy and energy efficiency.

In 2010, the U.S. Department of Labor (USDOL) awarded the Alaska Workforce Investment Board (AWIB) a $3.6 million American Recovery and Reinvestment Act (ARRA)grant for "green job" training based on 1) the formation of the Alaska State Energy Sector Partnership (ASESP); and 2) development of an energy sector workforce plan for Alaska that would be adopted by the AWIB. The ASESP was formed with the following mission:

> The ASESP will develop the Alaska Renewable Energy and Energy Efficiency Workforce Development Plan (RE/EE Plan), a sustainable strategic workforce plan to increase the supply of skilled workers with energy efficiency skills that will support weatherization technology and geothermal, hydroelectric, wind, and biomass industries.

Led by the AWIB, ten groups (listed in Appendix, page 9) formed the ASESP. These groups represent state agencies, labor unions, postsecondary and adult training programs, and others whose mission is directly related to Alaska's energy sector.

The goal of the Alaska Renewable Energy and Energy Efficiency Workforce Development plan is to provide training that meets industry standards and leads to employment and careers, ensuring that Alaska youth and adults attain the skills to obtain a renewable energy/energy efficiency career in Alaska. The RE/EE Plan is research-based, focused on the energy sector economic market, identifies labor demand, and provides strategies to supply the workforce. It creates educational energy sector career paths for students and adults to connect to the courses and training they will need to participate in the energy sector economy. A key focus is to develop the outreach and communications needed to inform communities and individuals about energy sector projects and jobs in their area and to provide a timely response for local training needs. The result will be a technically trained Alaska workforce capable of meeting Alaska's energy sector needs.

The RE/EE Plan consists of five strategies divided into the two major categories of Policy and Procedure and Outreach:

I. Policy and Procedure

Strategy 1: Identify current and emerging components of Alaska's energy sector.

Strategy 2: Align energy sector components with educational pathways, training programs, and regional plans.

Strategy 3: Evaluate the progress and success of implementing the RE/EE Plan and make workforce system improvements through public policy.

Strategy 4: Identify current energy sector education and training programs and education and training gaps in Alaska, and recommend ways to close those gaps.

II. Outreach

Strategy 5: Increase awareness about the energy industry, employment, and career opportunities.

Each strategy is further defined by specific action items, which are detailed beginning on page 7.

B. Background

Many Alaska communities have developed local Energy Plans. These plans identify energy efficiency options as well as potential locally available energy resources for generating electricity and heat. The Alaska Energy Authority and the Alaska Center for Energy and Power prepared a document called, "A Guide for Alaskan Communities to Utilize Local Energy Resources – January 2009" to assist communities in developing local Energy Plans (http://www.akenergyauthority.org/PDF%20files/AK%20Energy%20Final.pdf).

In recent years, the federal government, state legislature, state agencies, communities, regions, and energy-related groups have begun taking steps to meet Alaska's energy needs through a variety of energy reports and plans and energy efficiency programs. The Alaska RE/EE Plan will provide a focused framework for aligning these efforts, which are summarized below.

Federal Funding

Federal American Recovery and Reinvestment Act of 2009 (ARRA) funds have been invested in many Alaska energy sector programs and projects such as:

- State facilities energy efficiency projects - $10 million.
- Schools and municipal facilities energy efficiency projects - $8 million.
- Low income housing facilities energy efficiency projects - $2.5 million.
- Village facilities energy efficiency program - $3.7 million.
- Energy efficiency resources and tools for communities and businesses - $4 million.

Alaska Legislation and Funding

Important milestones, programs, and bills that affect the energy sector economy include:

- Creation of the Renewable Energy Grant Fund (House Bill 152 in 2008).
- A goal to produce 50 percent of Alaska's electricity from renewable sources by 2025 (House Bill 306 in 2010).
- A goal to increase energy efficiency on a per capita basis in Alaska by 15 percent by 2020 (House Bill 306 in 2010).
- A mandate to energy retrofit 25 percent of Alaska's public buildings by 2020 (Senate Bill 220 in 2010).
- Creation of a $250 million energy conservation revolving loan fund to finance public building retrofits (Senate Bill 220 in 2010).
- Creation of the Emerging Energy Technology Fund (Senate Bill 220 in 2010).

In order to implement this legislation, the state has appropriated over $700 million since 2008:

- $461 million for the Alaska Home Energy Rebate and Weatherization Programs to make thousands of homes more energy efficient and reduce household energy costs.
- $176.6 million for the Renewable Energy Grant Fund to help finance 208 renewable energy reconnaissance, feasibility, design and construction projects.
- $4.8 million to capitalize the Emerging Energy Technology Fund to support development of new technologies not eligible under the Renewable Energy Grant Fund.
- Over $100 million for other renewable energy projects.

ASESP Training Organizations

Training programs for RE/EE jobs are currently being funded through the ASESP grant through training organizations such as:

- Alaska Apprenticeship Training Coordinator Association
- Alaska Energy Authority
- AVTEC – Alaska's Institute of Technology
- Alaska Works Partnership, Inc.
- University of Alaska Southeast
- Yukon Inter-Tribal Watershed Council

Alaska's Current Energy Sector

The energy sector workforce is emerging from a variety of Alaska industries. A survey of green jobs cited in the September 2011 edition of "Alaska Economic Trends" (http://www.labor.state.ak.us/trends/sep11.pdf) found:

- Green jobs do not make up an industry of their own; they span all industries where employers pursue more environmentally sustainable concepts.
- 9.4 percent of Alaska employers (1,552) reported workers in a green job.
- There are more than 5,000 workers in the green jobs workforce.
- Most workers in green jobs do not spend 100 percent of their time producing a green product or service.
- The largest concentration of green jobs is in local government, and tour guides is the occupation with the largest green employment.
- About half of all green jobs require extensive on-the-job training, certification, or special licensing.
- More than 40 percent of green jobs are performed by construction workers.

Alaska's Energy Districts

Alaska's three distinct "energy districts" are Southeast Alaska, the Railbelt and Southcentral Alaska, and Bush/Rural Alaska.

Southeast Alaska

Most of Southeast Alaska generates hydroelectricity at a relatively low cost and predominantly uses oil and wood for space heating. Some communities are connected by interties, while other communities that are more similar to the Alaska Bush/Rural communities described below, depend on stand-alone grids using diesel fuel power.

The cost of hydroelectricity is becoming cheaper relative to the cost of heating oil. As oil prices rise, many Southeast residents are switching to electricity to heat their homes. This has had the

unintended consequence of putting so much demand on utilities' hydro capacity that they are using backup diesel generators to keep up with the demand. This hydroelectric to diesel switch is making biomass energy much more attractive, especially in Southeast, which has abundant forest resources, such as the Tongass National Forest. In 2010, the Sealaska Corporation installed a large-scale pellet boiler at its corporate headquarters in Juneau. Additional wood-fired boilers have been installed in Craig and Coffman Cove. These projects may provide a local market for processed wood pellets.

Railbelt and Southcentral Alaska

There are two sub-regions in this district, the Copper Valley corridor from Valdez to Delta Junction, including Tok and Eagle, and the Railbelt area from Nanwalek in the south to Fairbanks in the north. These two sub-regions are not connected through interties, though that has long been discussed as a possibility.

Anchorage and Kenai Peninsula have for years relied heavily on relatively inexpensive natural gas for electricity and heat. However, natural gas supplies have been diminishing, and efforts to run North Slope natural gas to the Railbelt have not made significant progress. Large supplies of Cook Inlet gas have been estimated by the U.S. Geological Survey (USGS) but the relatively small and isolated Railbelt energy market is still likely to pay higher prices for natural gas than the continental U.S. shale gas markets. This price uncertainty and volatility for natural gas is driving more renewable energy development in the Railbelt.

Two new commercial wind farms are nearing production, and a large-scale hydroelectric dam on the Susitna River has just entered the permitting process with the Federal Energy Regulatory Commission (FERC). In addition, energy efficiency retrofitting is gaining traction in the state's most populous region.

Bush/Rural Alaska

Bush/Rural Alaska is accessible only by air or water, and is not connected by road to other parts of the state. This region is distinguished from most parts of the other two regions by remote, stand-alone electric grids and extremely high energy prices. The cost of electricity is about six times the national average, and heating oil prices are up to four times the national average. Stand-alone micro-electric grids powered by diesel generators are the norm, although almost 20 communities have added wind power in the last several years to create wind-diesel hybrid systems that reduce the amount of diesel fuel used. Other site-specific renewable energy resources being developed or tested in rural Alaska include geothermal, solar, biomass and river hydrokinetic.

Bush/Rural Alaska is plagued by high shipping costs and lack of a skilled labor force for power plants and other generation and distribution systems. Lack of maintenance over time has taken its toll on buildings, power plants, electric grids, and heating systems. Oil storage has been problematic, with numerous leaks and spills occurring over the years in the process of shipping, transferring, and storage. When rivers run with low water, barges are unable to deliver fuel. Ice prevents delivery of fuel in winter, and if a community runs short, air freighted fuel is required to get the village through until a barge can resupply in the spring. Air freight may add up to several dollars per gallon to the retail cost of the fuel.

C. Goal, Strategies, and Actions

Goal

The goal of the RE/EE plan is to provide training that meets industry standards and leads to employment and careers, ensuring that Alaska youth and adults attain the skills to obtain a renewable energy/energy efficiency career in Alaska. Alaska workers, businesses, employers, and communities benefit from economic opportunities associated with developing alternative and renewable energy sources, operating and maintaining energy systems, and making homes and buildings more energy efficient.

The plan has identified five strategies, which are divided into two categories: I. Policy and Procedure (Strategies 1, 2, 3, and 4); and II. Outreach (Strategy 5).

Strategies and Actions

I. Policy and Procedure

Strategy 1: Identify current and emerging components of Alaska's energy sector.

- 1.1 Identify alternative energy (AE), renewable energy (RE), and energy efficiency (EE) projects, locations, and timelines.
- 1.2 Identify Alaska's green occupations and other energy sector occupations and estimate labor supply and demand (labor market analysis).
- 1.3 Identify existing energy occupation training programs (secondary and postsecondary).

Strategy 2: Align energy sector components with educational pathways, training programs, and regional plans.

- 2.1 Identify where energy sector occupations fit among career clusters and pathways, the education and skills required, and connecting points for students and adults along the career pathways.
- 2.2 Align energy sector career pathways with state education systems (secondary and postsecondary) in accord with Alaska's Career and Technical Education (CTE) Plan.
- 2.3 Identify and endorse nationally recognized industry skill standards and certification or licensing for the energy sector workforce that meet Alaska market conditions.
- 2.4 Connect energy sector workforce development planning, including education and training, with other energy policy councils, industry representatives, and agencies.

Strategy 3: Evaluate the progress and success of implementing the RE/EE Plan and make workforce system improvements through public policy.

- 3.1 Evaluate the employment outcomes of persons trained for RE/EE occupations.
- 3.2 Determine the employment success rate of each RE/EE training program.
- 3.3 Research and analyze the economic impact of the energy sector market and jobs on Alaska's economy.
- 3.4 Examine employment policies in state procurement contracts related to energy sector projects, and recommend policy changes that increase opportunities for local workers in energy occupations.

3.5 Develop and support business incentives for Alaska Hire Policy in energy occupations.

3.6 Recommend public workforce resource allocation to meet emerging energy industry and workforce training needs.

Strategy 4: Identify current energy sector education and training programs and education and training needs and gaps in Alaska, and recommend ways to close those gaps.

4.1 Identify energy sector courses, programs, training, certificates, and degrees available in Alaska.

4.2 Determine energy sector workforce and training needs and gaps.

4.3 Identify, create, and promote professional development opportunities for educators and trainers.

4.4 Recommend methods for closing energy sector education and training gaps.

II. Outreach

Strategy 5: Increase awareness about the energy industry, employment, and career opportunities.

5.1 Develop energy sector outreach message, media, materials, and steps for successful outreach initiatives.

5.2 Develop outreach and career awareness information and career activities for K-12 and distribute to schools.

5.3 Develop outreach and career awareness information for adults; distribute through the Alaska Job Center Network, Regional Training Centers (RTCs), and UA programs.

5.4 Inform the public about energy sector programs of study through school districts and University of Alaska CTE programs, Registered Apprenticeship sponsors, industry associations, and public information outlets.

D. Appendix

Alaska State Energy Sector Partnership (ASESP)

ASESP partners are:

- Alaska AFL-CIO – the state's largest labor organization, representing 60,000 union members belonging to over 50 affiliated unions statewide, and also representing the interests of workers not represented by unions.
- Alaska Department of Labor and Workforce Development (DOLWD) – state agency whose mission it is to provide safe and legal working conditions and advancing opportunities for employment.
- Alaska Energy Authority (AEA) – a public corporation created in 1976 by the Alaska legislature. AEA's mission is to reduce the cost of energy and to oversee rural energy programs.
- Alaska Housing Finance Corporation (AHFC) – the state's official housing authority. Programs include community planning and development, direct and pass-through grants, technical assistance, tax credits, affordable rental housing, and energy rebate/weatherization programs.
- Alaska Workforce Investment Board (AWIB) – state board appointed by the governor to provide policy oversight of state and federally funded job training and vocational education programs. Members represent business/industry, labor unions, state agencies, training providers, and secondary and postsecondary education. The AWIB is housed under the Alaska Department of Labor and Workforce Development.
- Alaska Works Partnership, Inc. – partnership program of Alaska's construction trades unions and jointly administered apprenticeship programs. Administers Construction Academies, Women in the Trades, and Helmets to Hardhats programs, rural apprenticeship outreach, and pipeline training programs.
- Denali Commission – federal-state partnership designed to provide critical utilities, infrastructure, and economic support throughout rural Alaska, with a focus on remote communities.
- Renewable Energy Alaska Project (REAP) – coalition of Alaska utilities, businesses, conservation and consumer groups, Alaska Native organizations, and municipal, state and federal entities with an interest in developing Alaska's vast renewable energy resources. Their goal is to increase the production of renewable energy in Alaska and bring the benefits of clean, economic, and inexhaustible renewable power to the citizens of Alaska.
- University of Alaska (UA) – the state's public university system, comprised of three main campuses and nine smaller campuses, with a total of nearly 35,000 full- and part-time students enrolled in more than 500 degree, certificate, or endorsement programs.
- U.S. Department of Labor (USDOL) Alaska Office of Apprenticeship – in conjunction with USDOL Office of Apprenticeship, works to register apprenticeship programs, protect safety and welfare of apprentices, issue certificates of completion, promote new apprenticeship programs, and assure that apprenticeship programs are high quality and produce competent workers.

The ASESP planning process for the RE/EE Plan also included input from these other Alaska entities: Department of Education & Early Development, Department of Transportation & Public Facilities, Joint Electrical Apprenticeship and Training Trust, and Fairbanks Area Plumbers and Pipefitters Joint Apprenticeship Training Committee.

Definitions

Term	Definition	Source
Alaska energy districts	Alaska's three distinct energy districts are Southeast Alaska, the Railbelt and Southcentral Alaska, and Bush/Rural Alaska. The distinctions include the current primary energy source - hydro-electric, natural gas, or fuel oil.	Alaska Workforce Investment Board http://www.labor.state.ak.us/awib/2012-feb-mtg-binder/asesp.pdf
Alternative energy	Energy such as solar, wind, or nuclear energy, that can replace or supplement traditional fossil-fuel sources such as coal, oil, and natural gas.	Dictionary.com http://dictionary.reference.com/browse/alternative+energy
Biomass	As a renewable energy source, biomass is biological material from living, or recently living organisms. As an energy source, biomass can either be used directly, or converted into other energy products such as biofuel.	Wikipedia http://en.wikipedia.org/wiki/Biomass
Bush Alaska	The Bush in Alaska is generally described as any community not on the road system, making it accessible only by more elaborate transportation.	Wikipedia http://en.wikipedia.org/wiki/The_bush
Career clusters	Career clusters are groups of similar occupations and industries. They were developed by the U.S. Department of Education as a way to organize career planning.	States' Career Cluster Initiative www.careerclusters.org
Career pathway	A career pathway is a coherent, articulated sequence of rigorous academic and technical courses, beginning in high school and leading to an associate degree, baccalaureate degree and beyond, an industry recognized certificate, and/or licensure. The career pathway is developed, implemented, and maintained in partnership among secondary and postsecondary education, business, and employers. Career pathways are available to all students, including adult learners, and lead to rewarding careers.	National Career Pathways Network http://www.cord.org/career-pathways/

Energy efficiency	Programs aimed at mitigating the use of energy, reducing harmful emissions, and decreasing overall energy consumption.	Federal Register, Volume 74, No. 120, June 24, 2009/Notice – Notice of Solicitation for Grant Applications for State Energy Sector Partnership and Training Grants. http://www.gpo.gov/fdsys/pkg/FR-2009-06-24/html/E9-14922.htm
Energy industry	All economic activity that is involved in the production and sale of energy, including fuel extraction, manufacturing, refining, and distribution. Sometimes used interchangeably with "energy sector."	Wikipedia http://en.wikipedia.org/wiki/Energy_industry
Energy sector	A category of businesses that relate to producing or supplying energy. Sometimes used interchangeably with "energy industry."	Washington State Department of Labor https://fortress.wa.gov/esd/employmentdata/help/glossary
Geothermal energy	Heat that is generated and stored in the Earth.	Wikipedia http://en.wikipedia.org/wiki/Geothermal_energy
Green job	A job that provides a good or service in at least one of seven categories: • Renewable energy • Energy efficiency • Greenhouse gas reduction • Pollution prevention, reduction, and cleanup • Recycling and waste reduction • Agricultural and natural resources conservation • Education, compliance, public awareness, and training	Alaska Department of Labor and Workforce Development – Research and Analysis Division http://www.labor.state.ak.us/trends/sep11.pdf
Hydroelectric energy or hydroelectricity	The production of electrical power through the use of the gravitational force of falling or flowing water.	Wikipedia http://en.wikipedia.org/wiki/Hydroelectricity
Interties	Transmission lines that link two or more regional electric power systems.	California Energy Commission Consumer Energy Center http://www.consumerenergycenter.org/glossary/i.html

Program of study	A coordinated sequence of courses, both academic and CTE, that include both secondary and postsecondary components and lead to a specific outcome where the learner is qualified to enter a career pathway.	States' Career Cluster Initiative http://www.careerclusters.org/resources/web/pos.cfm
Renewable energy	Energy generated from solar, wind, biomass, landfill gas, ocean (including tidal, wave, current, and thermal), geothermal, municipal solid waste, or new hydroelectric generation capacity achieved from increased efficiency or additions of new capacity at an existing hydroelectric project.	Energy Policy Act of 2005, Public Law 109-58, 119 Stat.595 http://www.gpo.gov/fdsys/pkg/PLAW-109publ58/pdf/PLAW-109publ58.pdf
Solar energy	Radiant light and heat from the sun.	Wikipedia http://en.wikipedia.org/wiki/Solar_energy
Weatherization	The practice of protecting a building and its interior from the elements and of modifying a building to reduce energy consumption and optimize energy efficiency.	Wikipedia http://en.wikipedia.org/wiki/Weatherization
Wind energy	Kinetic energy from the wind.	Wikipedia http://en.wikipedia.org/wiki/Wind_turbine
Wind turbine	A device that converts kinetic energy from the wind into mechanical energy.	Wikipedia http://en.wikipedia.org/wiki/Wind_turbine

Acronyms

Acronym	Full Name	Website
AE	Alternative Energy	http://dictionary.reference.com/browse/alternative+energy
AEA	Alaska Energy Authority	http://www.akenergyauthority.org/
AHFC	Alaska Housing Finance Corporation	http://www.ahfc.us/home/index.cfm
ARRA	American Recovery and Reinvestment Act	http://www.recovery.gov/Pages/default.aspx
ASESP	Alaska State Energy Sector Partnership	http://labor.alaska.gov/bp/asesp.htm)
AVTEC	Alaska's Institute of Technology	http://avtec.labor.state.ak.us/
AWIB	Alaska Workforce Investment Board	http://labor.alaska.gov/awib/
CTE	Career and Technical Education	http://www.eed.state.ak.us/tls/CTE/
DOLWD	Alaska Department of Labor and Workforce Development	http://labor.alaska.gov/
EE	Energy Efficiency	http://www.energy.ca.gov/glossary/glossary-e.html
EED	Alaska Department of Education & Early Development	http://education.alaska.gov/
NAICS	North American Industry Classification System	http://www.census.gov/eos/www/naics/
FERC	Federal Energy Regulatory Commission	http://www.ferc.gov/
REAP	Renewable Energy Alaska Project	http://alaskarenewableenergy.org/
RE	Renewable Energy	http://www.energy.ca.gov/glossary/glossary-r.html
RTC	Regional Training Center	http://labor.alaska.gov/awib/cte_programs.htm
UA	University of Alaska	http://www.alaska.edu/alaska/
USDOL	United States Department of Labor	http://www.dol.gov/
USGS	United States Geological Survey	http://www.usgs.gov/