



Alaska Energy Authority Overview and Renewable Energy Fund Update

Senate Finance Committee
Feb. 1, 2013



Reducing the Cost of Energy

- Energy Planning and Policy
- Technical and Community Assistance
- Investing in Alaska's Energy Infrastructure
- Diversifying Alaska's Energy Portfolio



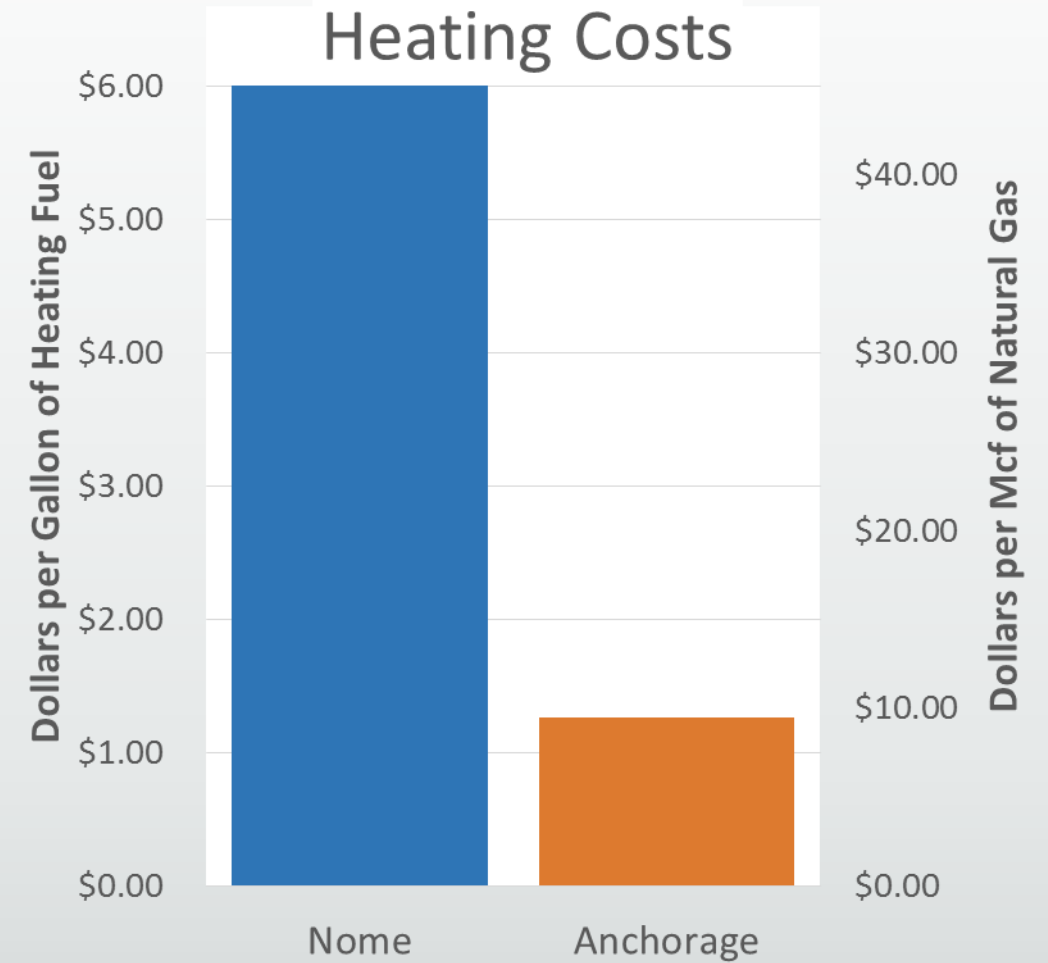
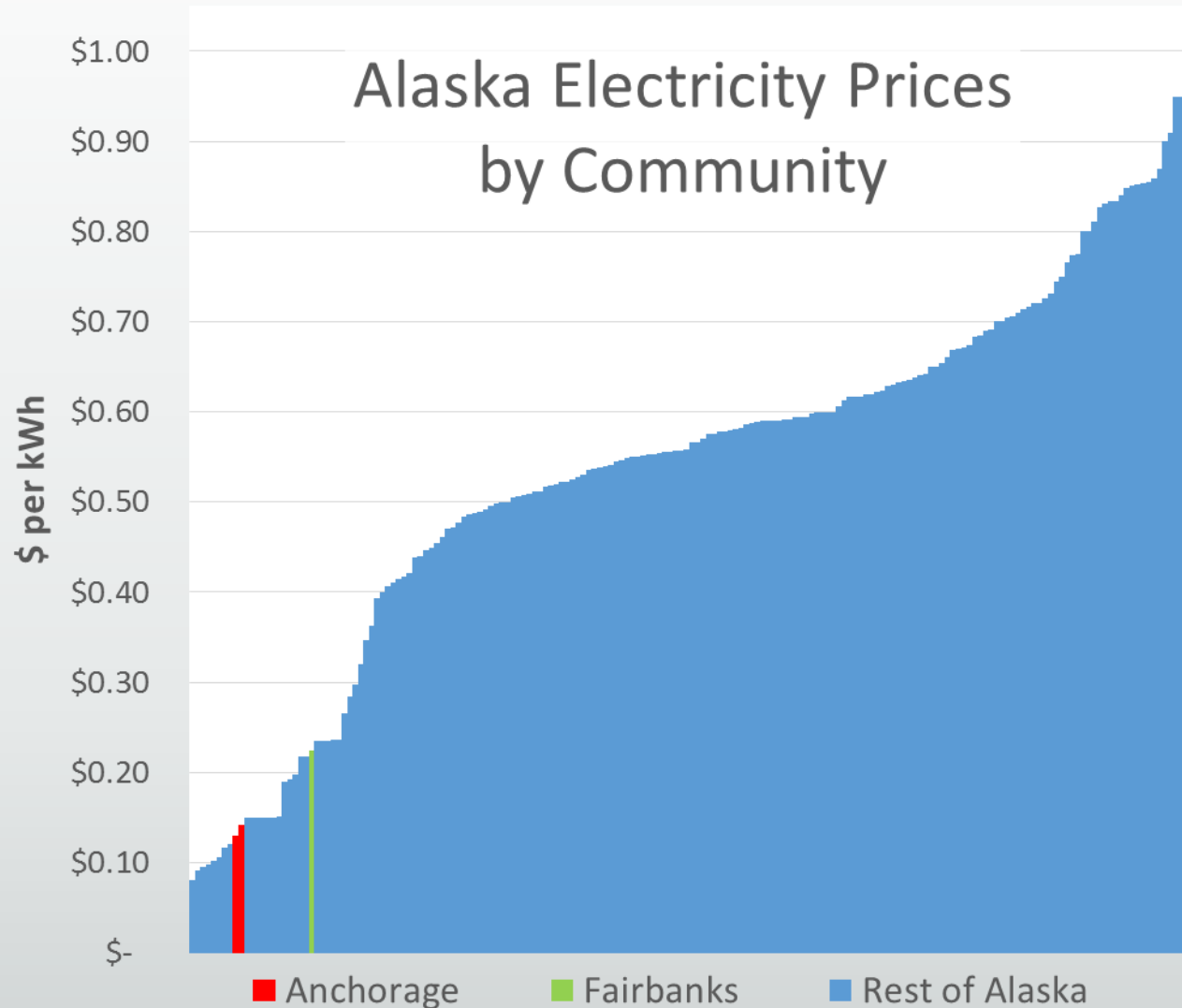
Electricity Generation by Region

Annual Electric Generation

AEA Energy Region	MWhs per Year	Percent of Total
Aleutians	65,340	1%
Bering Straits	55,362	1%
Bristol Bay	55,145	1%
Copper River/Chugach	116,700	2%
Kodiak	150,503	2%
Lower Yukon-Kuskokwim	96,625	1%
North Slope	82,544	1%
Northwest Arctic	35,549	1%
Railbelt	5,075,507	77%
Southeast	785,190	12%
Yukon-Koyukuk/Upper Tanan	31,175	0%
Total	6,549,640	100%

2011 Alaska Energy Statistics

Energy Costs Vary



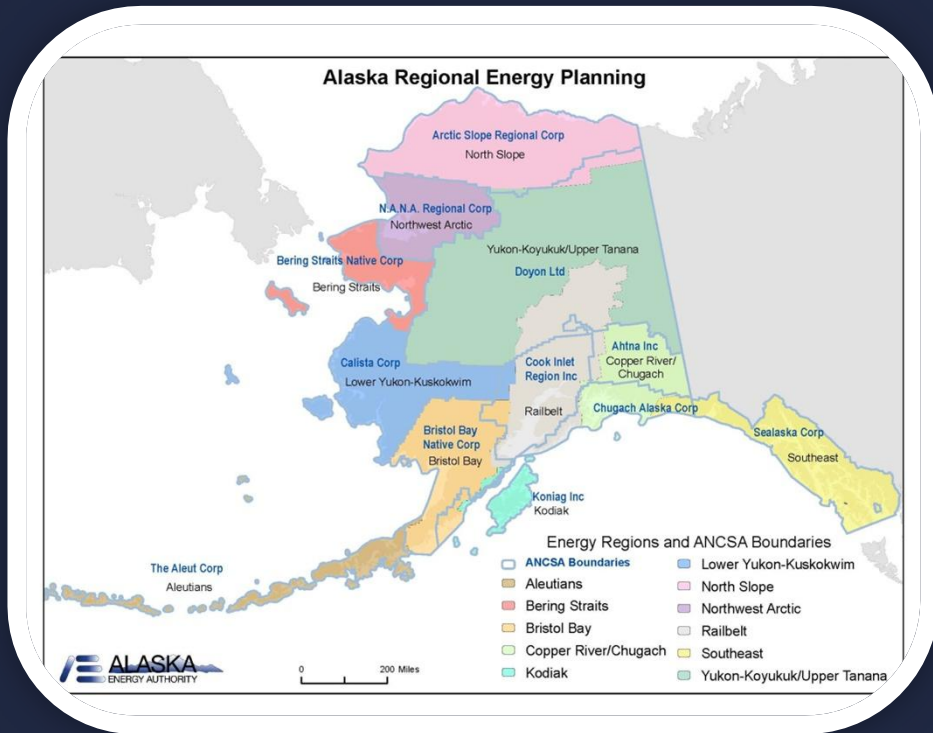
Energy Policy Development and Coordination

- Deputy Director for Statewide Energy Policy Development
- Serve as lead on Alaska's energy policy development
- Coordination of energy plans on statewide level
- Coordinate multi-agency efforts
- Individual project analysis and vetting
- Transmission planning
- Working with AIDEA on LNG trucking

Supporting Regional Solutions

Regional Energy Planning

- Energy Pathways led to regional planning
- Address unique challenges while capitalizing on regional resources
- Locally driven and community-vetted blueprint for sustainability
- Objective to provide specific, actionable recommendations
- Includes electric, heat and transportation energy
- Previous Plans: Railbelt Integrated Resources Plan and Southeast Integrated Resources Plan





Bradley Lake Hydroelectric Project



Alaska Intertie

Infrastructure and Large Projects

Bradley Lake Hydro

- State capital contribution 50%
- Produces about 10% of Railbelt electricity
- AEA-owned asset
- Low-cost energy producer
- 120 megawatts, 4.5 cents/kWh

Alaska Intertie

- AEA-owned with no outstanding debt
- Operated by AEA and Railbelt utilities

Susitna-Watana Hydro

- Will provide about 50% Railbelt electricity
- SB 42 authorized AEA to pursue licensing
- Long-term, stable rates

Rural Energy

Bulk Fuel and Rural Power System Upgrades

- Help utilities improve efficiency, safety and reliability of power systems
- Completed \$304 million in rural bulk fuel and rural power system upgrade projects since 2000, in partnership with Denali Commission
- Thirteen projects under construction next year
- Circuit rider technical assistance in 53 communities (FY 12)

Training and Technical Assistance

- Training for power plant operators, advance power plant, bulk fuel, electric utility manager, Power Cost Equalization
- Energy specialists assisted 40+ communities to advance to project-ready status



Rural Energy

Power Cost Equalization (PCE)

- Provide economic assistance in rural Alaska where electrical rates can be 3 to 4 times higher than in urban Alaska
- Available to community facilities and residential customers
- Regulatory Commission of Alaska (RCA) sets rates, calculations based on use, costs and efficiencies
- Approximately 77,341 people live in the 183 participating communities (FY 11)
- PCE payments at 100% totaling \$39.5 million (FY 12)
- \$788 million PCE Endowment

AEA Programs

Power Project Fund

- Low-interest loans to upgrade or develop small-scale electric power facilities
- Includes bulk fuel storage, transmission and distribution, waste energy, energy conservation, energy efficiency and alternative energy facilities and equipment
- State assistance for a project more than \$5 million requires Legislative approval
- \$35 million in Power Project Fund (~half in application process)
- 34 projects funded, \$31 million
- Pending applications: City of St. George, wind/diesel hybrid; Haida Energy Inc., hydroelectric project



Prince of Wales: Run-of-River Hydro



Chena Hot Springs: Geothermal

AEA Programs



Efficiency and Conservation

- State Goal: improve efficiency 15% by 2020
- AEA's focus is on commercial buildings, rural public buildings, industrial facilities and electrical efficiency
- Statewide outreach and education
- Support for multi-stakeholder group, Alaska Energy Efficiency Partnership AKEnergyEfficiency.org
- Coordination between State agencies
- Alaska Commercial Energy Audit Program
- Village Energy Efficiency Program



Energy Efficiency and Conservation

AEA Energy Efficiency and Conservation Programs: Results

- 132 participating Alaska communities, 419 buildings
- \$1,534,062 and 282,938 diesel equivalent gallons in projected savings
- Average immediate savings of implemented efficiency measures: \$0.29 cents/ \$1 invested, 300% ROI after 10 years
- Alaska Commercial Energy Audit Program measures produce 30% savings with 6.2 year simple payback

Community Highlight: Emmonak

Whole-Village Retrofit for Energy Efficiency

- AEA Programs: Village Energy Efficiency Program, Energy Efficiency and Conservation Block Grant Program
- Whole-village retrofit to reduce the cost of energy
 - Audits and efficiency retrofits in 8 community buildings
- Successes:
 - \$670,000 in efficiency and conservation investment projected to provide \$90,000 in annual savings
 - 27% of savings from efforts to reduce electricity consumption, remainder from reducing fuel consumption
 - Used local labor
 - Increased awareness



*Emmonak City Hall boiler before
and after efficiency improvements*

AEA Programs

Energy Statistics

- Summary and analysis of electricity generation and use across Alaska

Emerging Energy Technology Fund

- SB 220 (2010) created fund
- Through Denali Commission matching grant, \$8.9 million available
- First round, 16 project selected for funding (2012)
- Projects must be commercially viable within 5 years
- Projects in Juneau, Fairbanks, Kodiak, Delta Junction, Nenana, Nikiski, Igiugig, Tuntutuliak, Kwiglingok and Kotzebue



Altaeros Energies Helium Balloon Wind Turbine

AEA Programs

Renewable Energy Fund

- HB 152 (2008) authorized AEA to manage program, reauthorized in 2012
- 227 projects approved totaling \$202.5 million
- More than 60 projects currently under construction
- By 2016, 12.3 million gallons of diesel and natural gas equivalent will be displaced annually.
- Results: \$45 million in annual savings



Ruby: Hydrokinetic



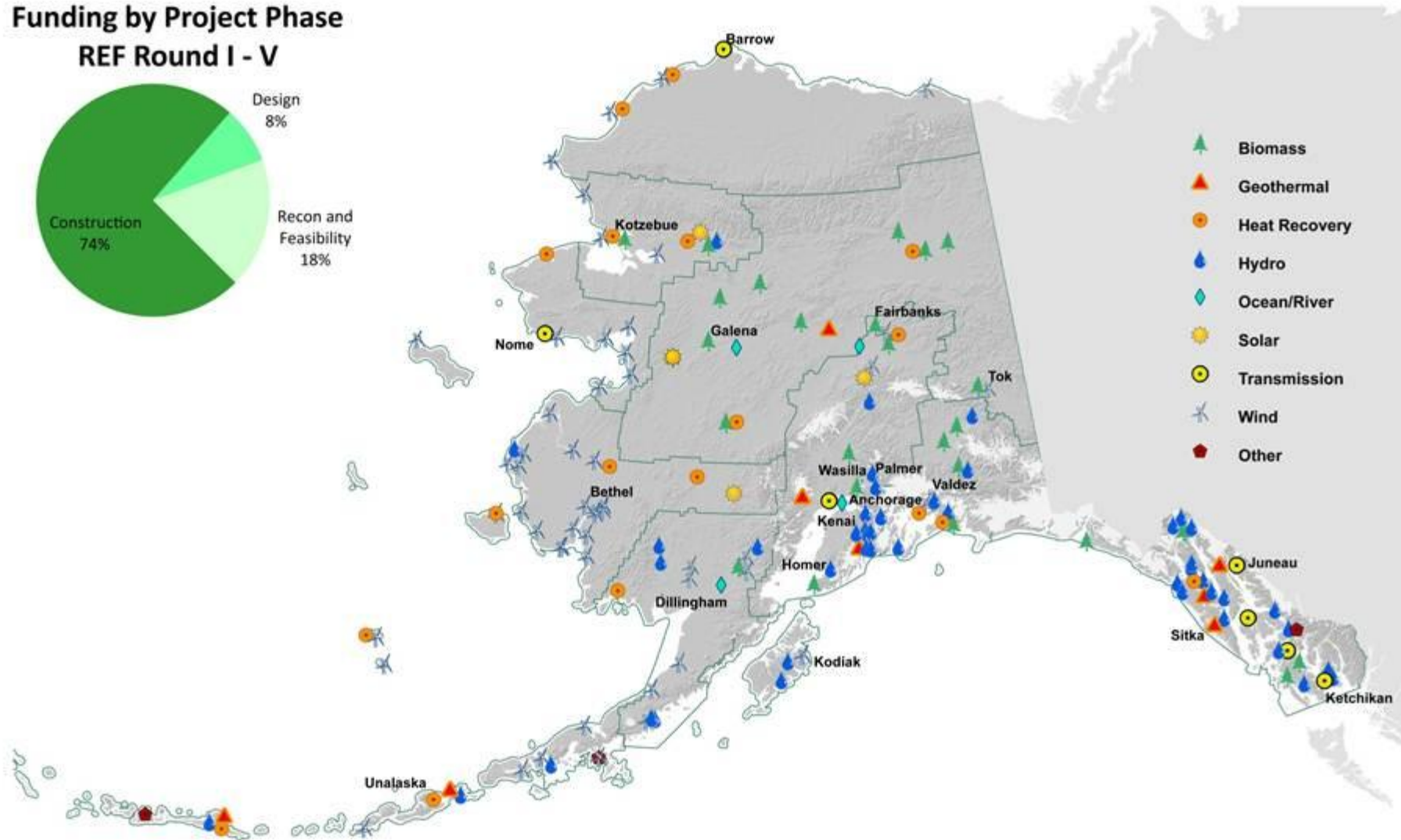
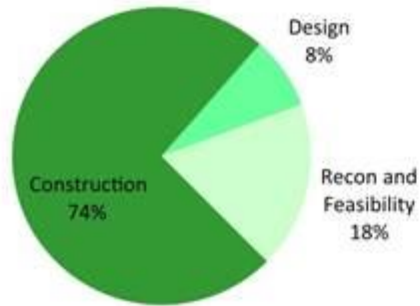
Unalakleet: Wind

Renewable Energy Fund: Evaluation Process

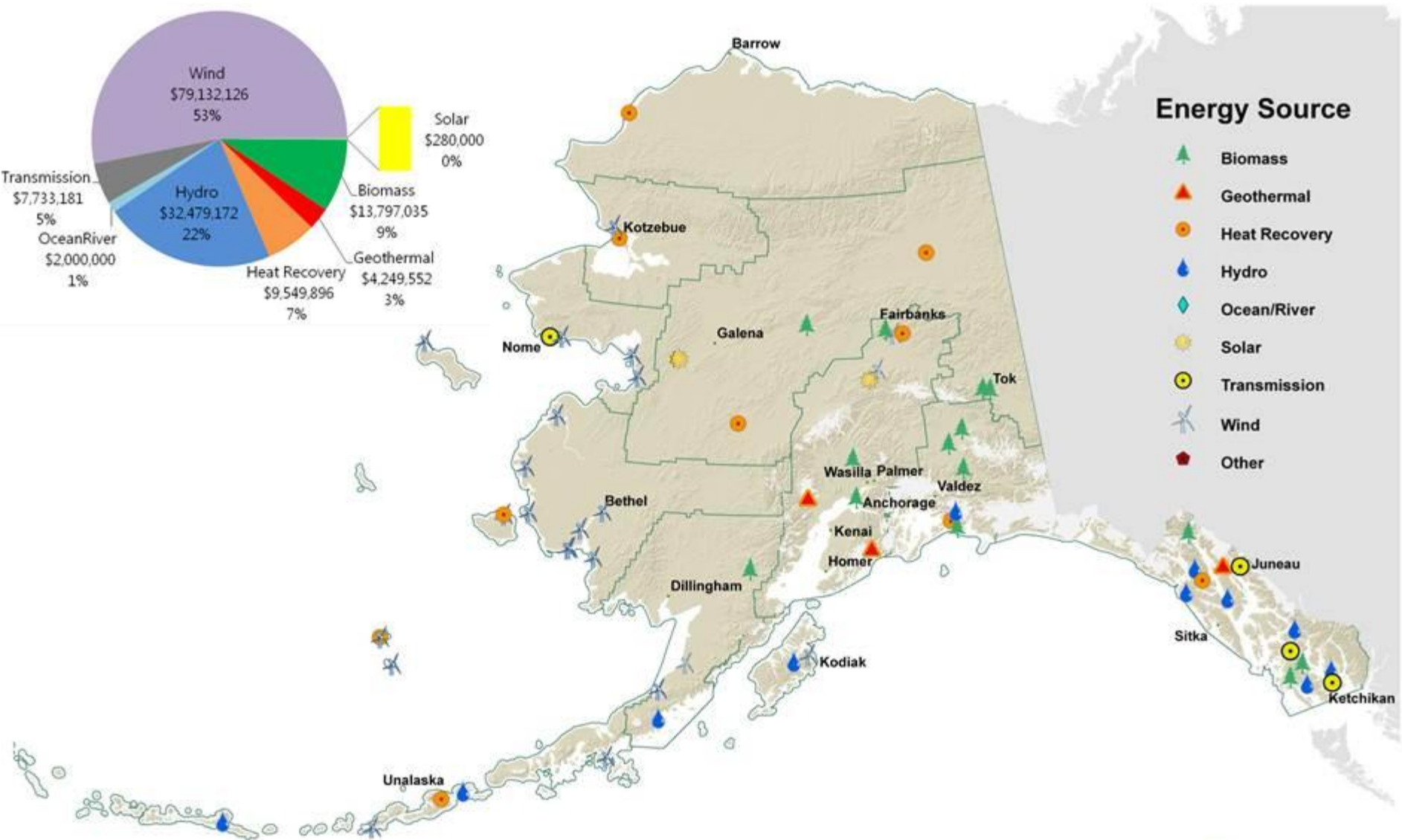
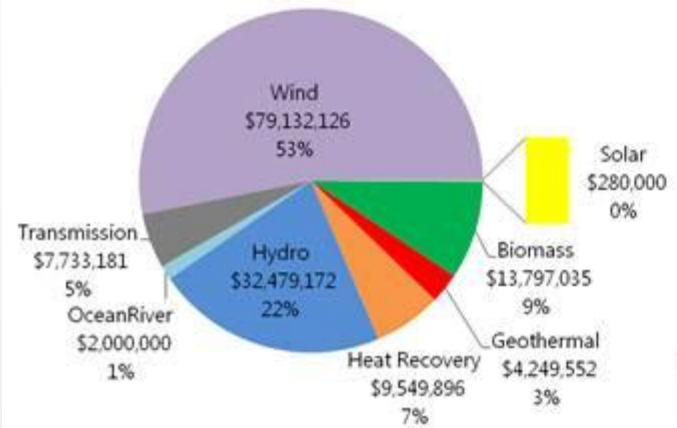
- Applications solicited and received by AEA
- Technical and Economic Review
 - Stage 1 – Qualifying project
 - Stage 2 – Technical & Economic
 - Stage 3 – Scoring for Rank
 - Stage 4 – Regional Spreading
- Renewable Energy Fund Advisory Committee
- Recommendations to the Legislature

Renewable Energy Fund Projects

Funding by Project Phase
REF Round I - V



Construction Projects (R1-5)



Renewable Energy Fund: Benefits

- Supports Alaska's 50% Renewable Power goal
- Diversifies Alaska's energy supply
- Reduces energy costs by:
 - Providing low-cost renewable energy to displace fossil fuels
 - Reducing the cost of renewable energy
 - Keeping more dollars in local community
- Provides consistent and efficient evaluation of projects and prospective funding
- Leverages State dollars to produce energy
- Enhances regional planning efforts



Alaska Energy Authority
Renewable Energy Grant Recommendation Program

Impact Evaluation Report

Volume 2

Prepared by:
Vermont Energy Investment Corporation

In Collaboration With:
Alaska Center for Energy and Power

January 22nd, 2013

Available at: AKenergyauthority.org

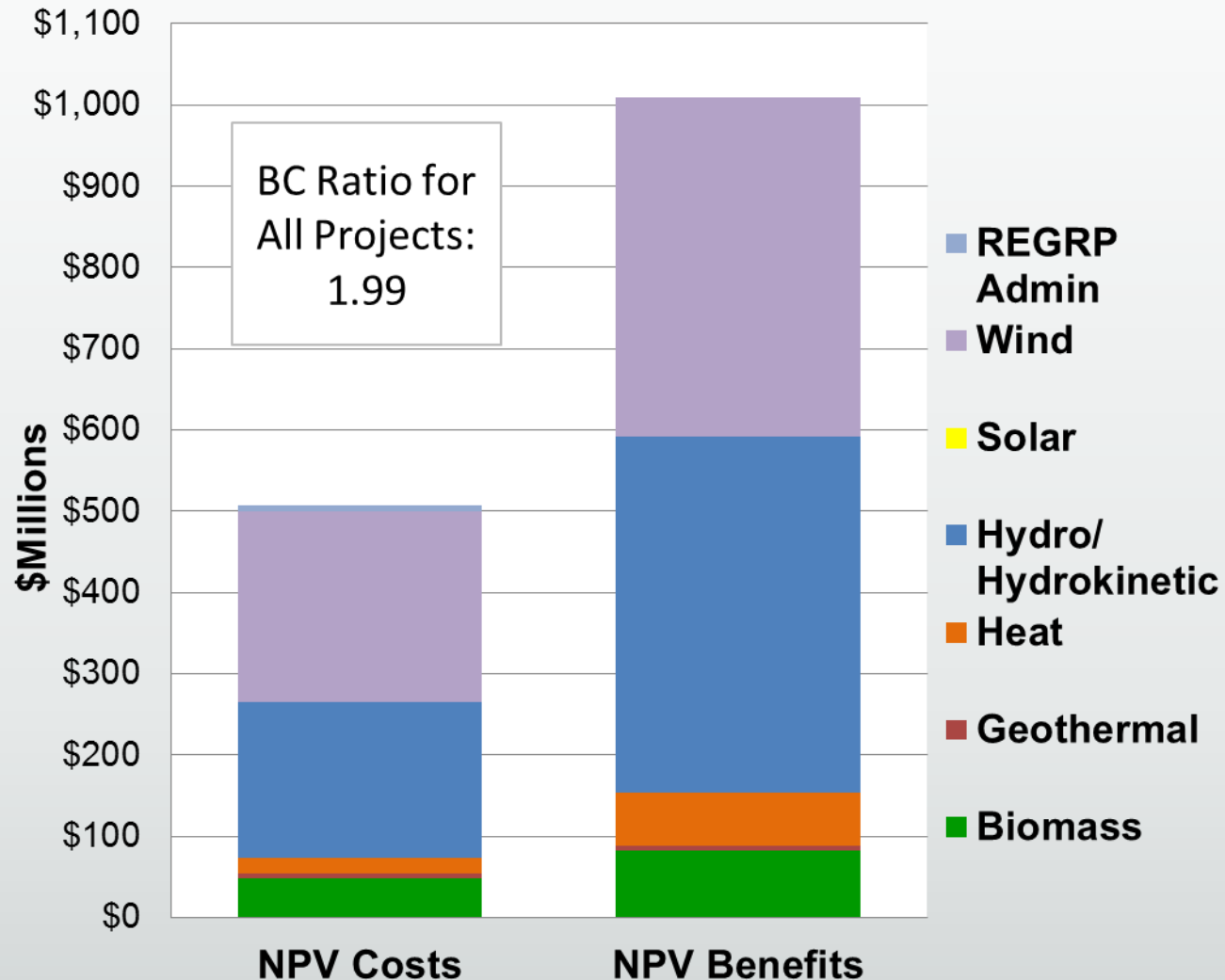
Renewable Energy Fund

Independent Program Review

- Vermont Energy Investment Corporation and the Alaska Center for Energy and Power
- Found energy savings, reduced emissions
- Renewable Energy Fund is cost effective
- Projects that have reached construction are projected to provide a positive net present value of more than \$500 million
- Increased knowledge base on renewable energy development in Alaska that will improve future projects
- Includes Renewable Energy Fund Rounds 1-4

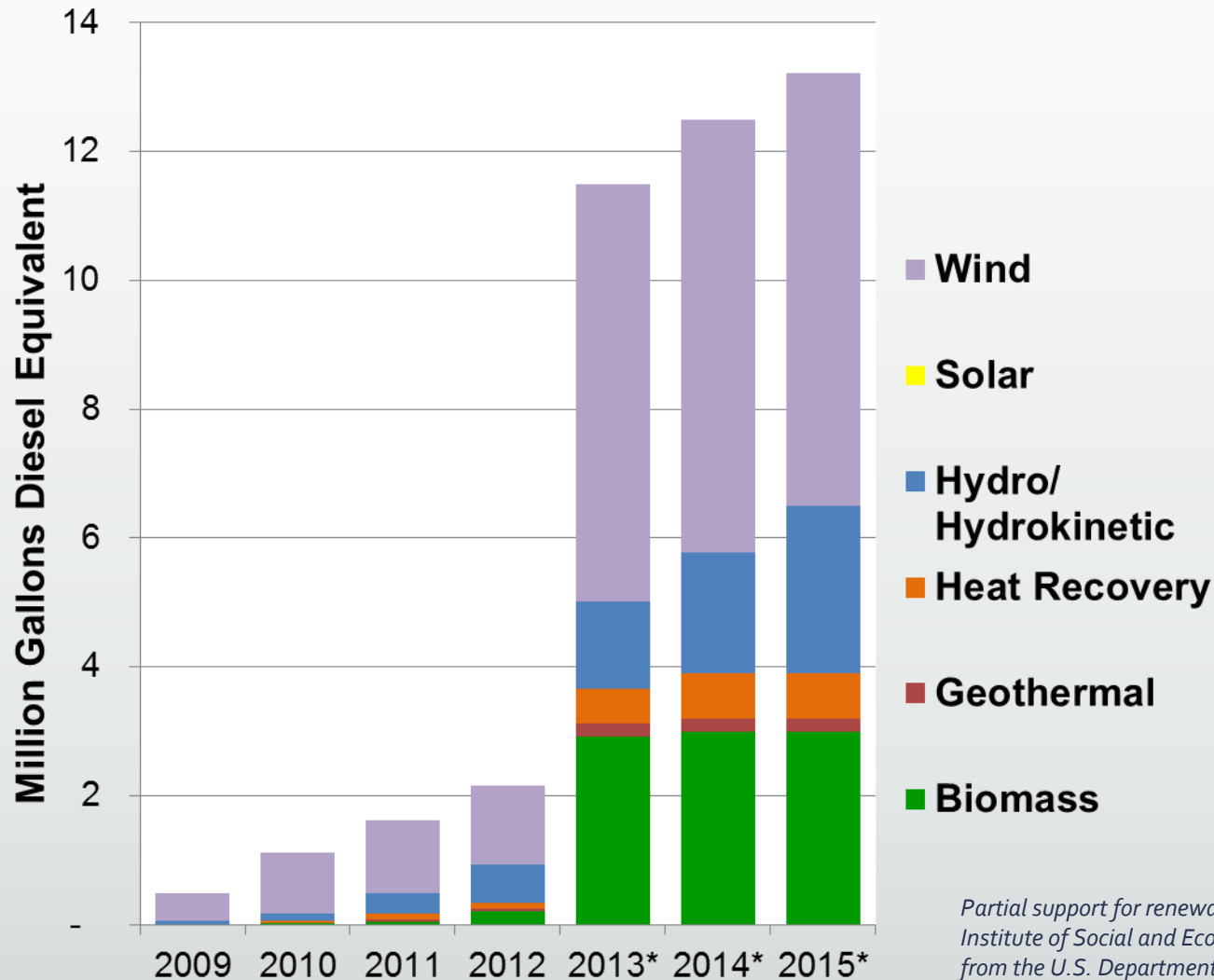


Renewable Energy Fund: Economic Benefits



- \$500 million net present benefits from Renewable Energy Fund projects in construction is projected
- Integrates actual performance from completed projects
- AEA manages grants, not programs, making it difficult to precisely identify the beneficiaries of the \$500 million

Renewable Energy Fund: Avoided Fuel

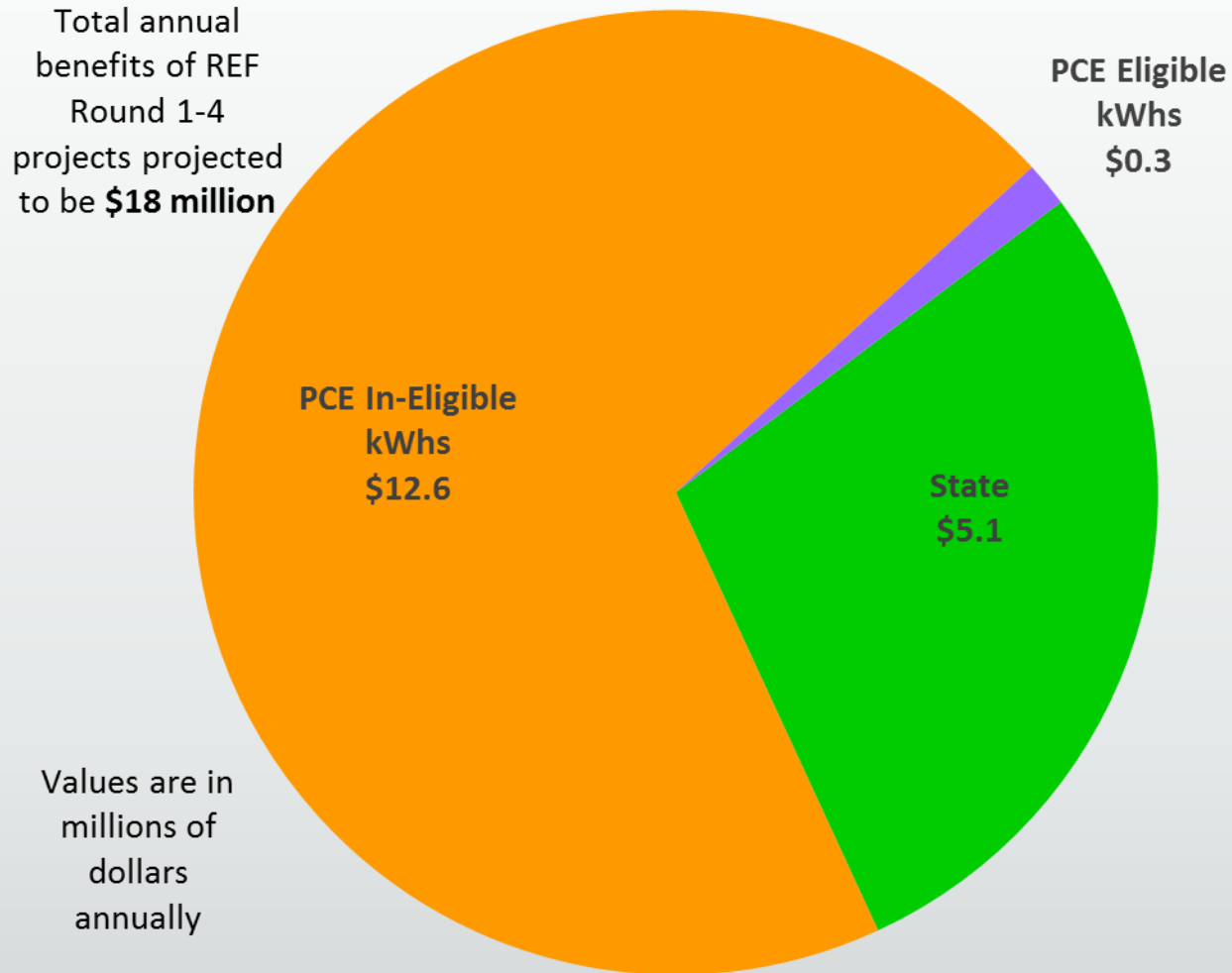


- Renewable Energy Fund projects offset a growing volume of fuel
- Large jump in 2013 is from Eva Creek Wind and ML&P Landfill Gas projects, both successful Railbelt projects
- Expect continued growth in avoided fuel as previously funded projects complete construction

Partial support for renewable energy fund project database developed by the Institute of Social and Economic Research, University of Alaska Anchorage from the U.S. Department of Energy, EPSCoR project DE-PS02-09ER09-12, Making Wind Work for Alaska: Supporting the Development of Sustainable, Resilient, Cost-Effective Wind-Diesel Systems for Isolated Communities

Renewable Energy Fund: PCE Communities

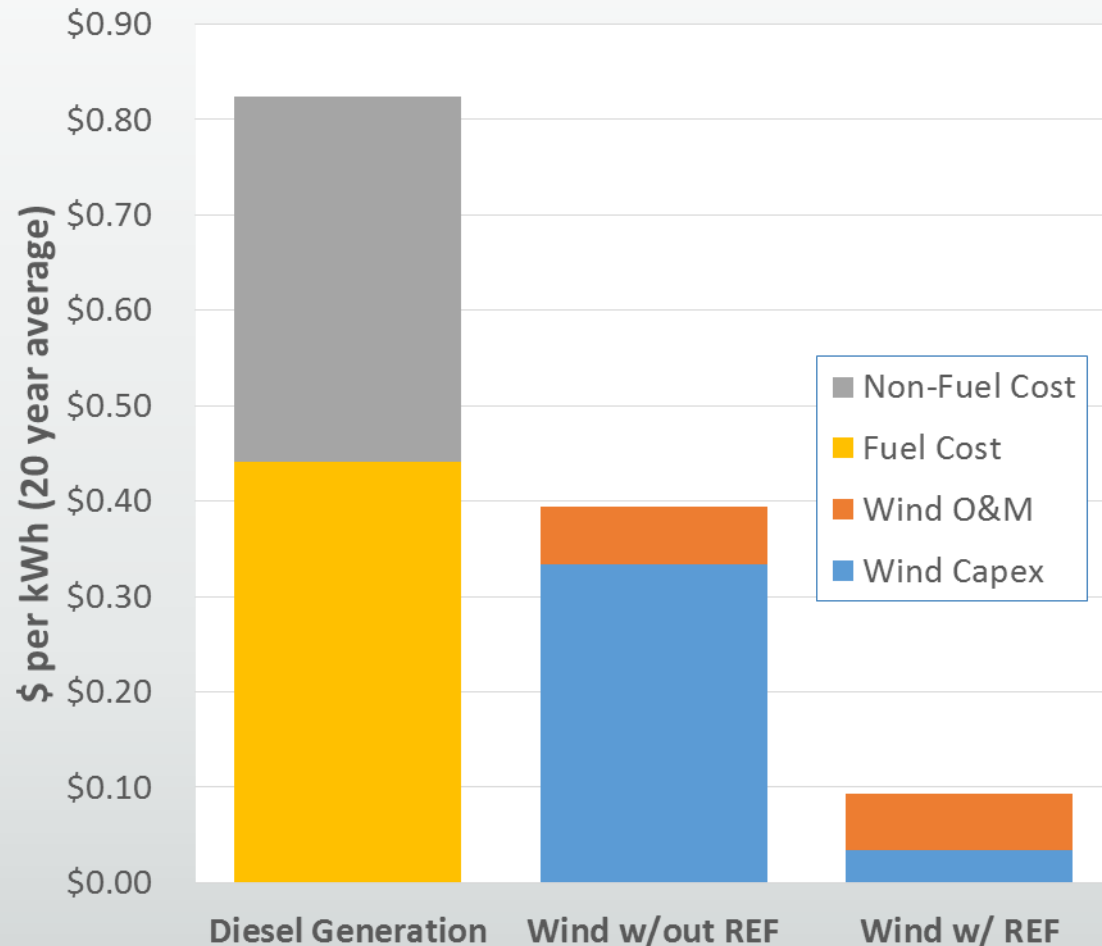
Distribution of Project Benefits



- \$18 million annual benefits from Renewable Energy Fund projects (Rounds 1-4) projected
- Most benefit goes towards non PCE kWhs (e.g., business, households exceeding monthly limit)

Renewable Energy Project: Lowering the Cost of Energy

Price Components: Rural Wind vs. Diesel



- We expect Renewable Energy Fund projects to lower power costs
 - Even without a REF grant
 - Achieving these economics are part of our scoring criteria
- Renewable Energy Fund grants help good projects get built
 - Provides needed capital
 - Decreases the payback period on good projects

Community Highlight: JBER

Landfill-Gas-To-Energy Project



GE Jenbacher gas engines at Doyon Utility's JBER facility

- Funding from AEA Renewable Energy Fund, Doyon Utilities and federal government
- Constructed in 2012
- Alaska's first landfill-gas-to-energy project
- Located on Joint Base Elmendorf-Richardson (JBER)
- Produce power from Anchorage Regional Landfill methane gas
- Expected results:
 - Will produce 56,000 megawatts annually, 26.2% of JBER's power use
 - Will produce more than \$50 million in savings over project life



Heat Exchanger



Community Highlight: Delta Junction

Delta Junction School Biomass

- Completed in September 2011
- High-efficiency, low-emissions wood chip biomass heating system
- Wood chips come from Dry Creek Saw Mill waste product
- Funding \$2M grant/\$2.8M total
- Simple Pay Back: 13 years for Renewable Energy funds, 19 years on total cost
- Successes:
 - During the first winter, saved \$153,000 and 53,000 gallons in heating
 - Allowed the school to save 2 teacher positions, reopen music program and remodel the school kitchen
 - Potential to add additional facilities
 - Easy maintenance

Community Highlight: Atka

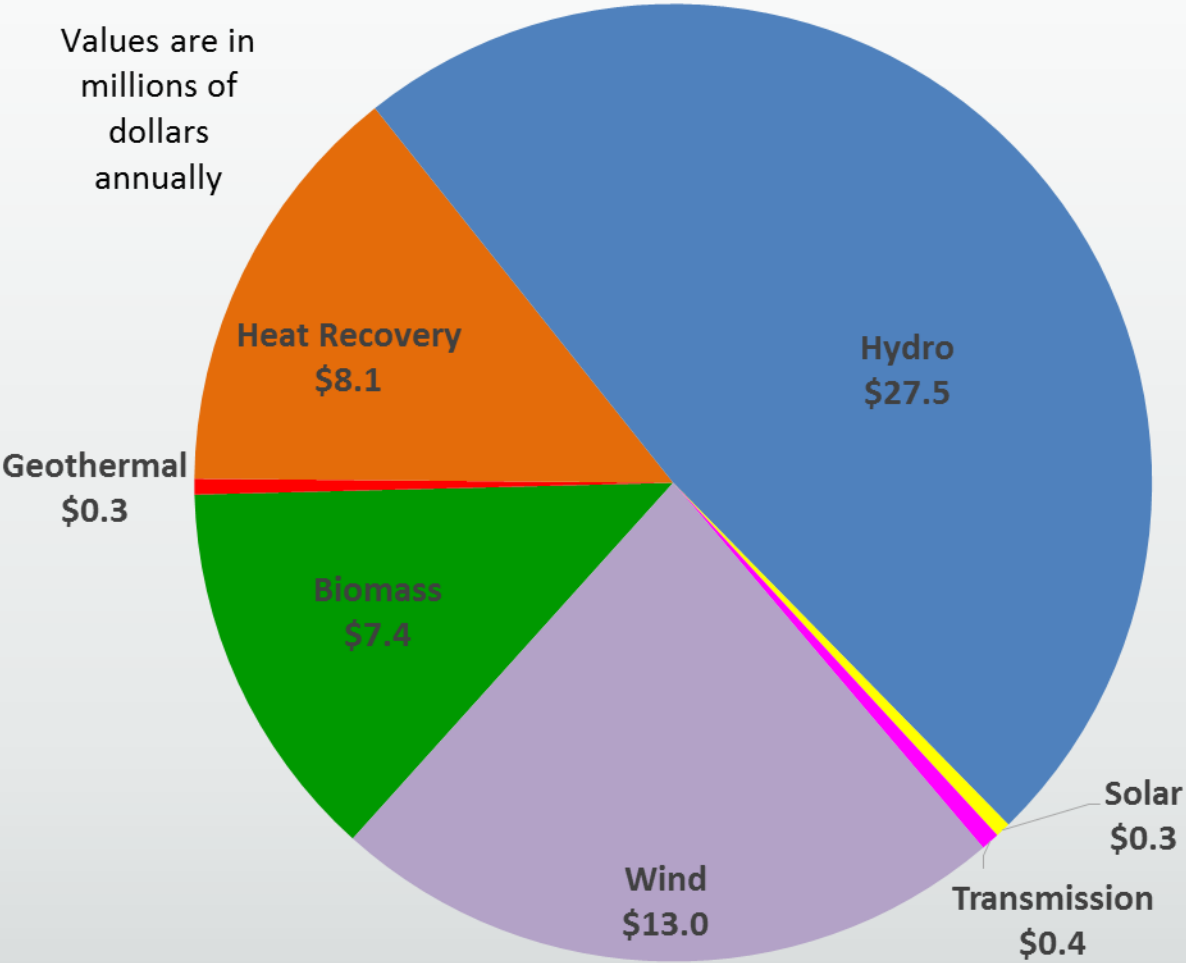
Chuniisax Creek Hydroelectric Project

- Completed in 2012 (City of Atka has pursued since 1997)
- Capacity: 283 kilowatts
- Will provide nearly 100 % of Atka's power needs, including a portion of Atka Pride Seafoods' demand
- Capital Cost: \$5 million
- 261,000 fuel savings
- Simple payback 21 years
- ROI 139%
- Used local labor
- Expected Results:
 - \$180,000 annual savings in diesel fuel costs
 - Potential to use excess power for electric heat

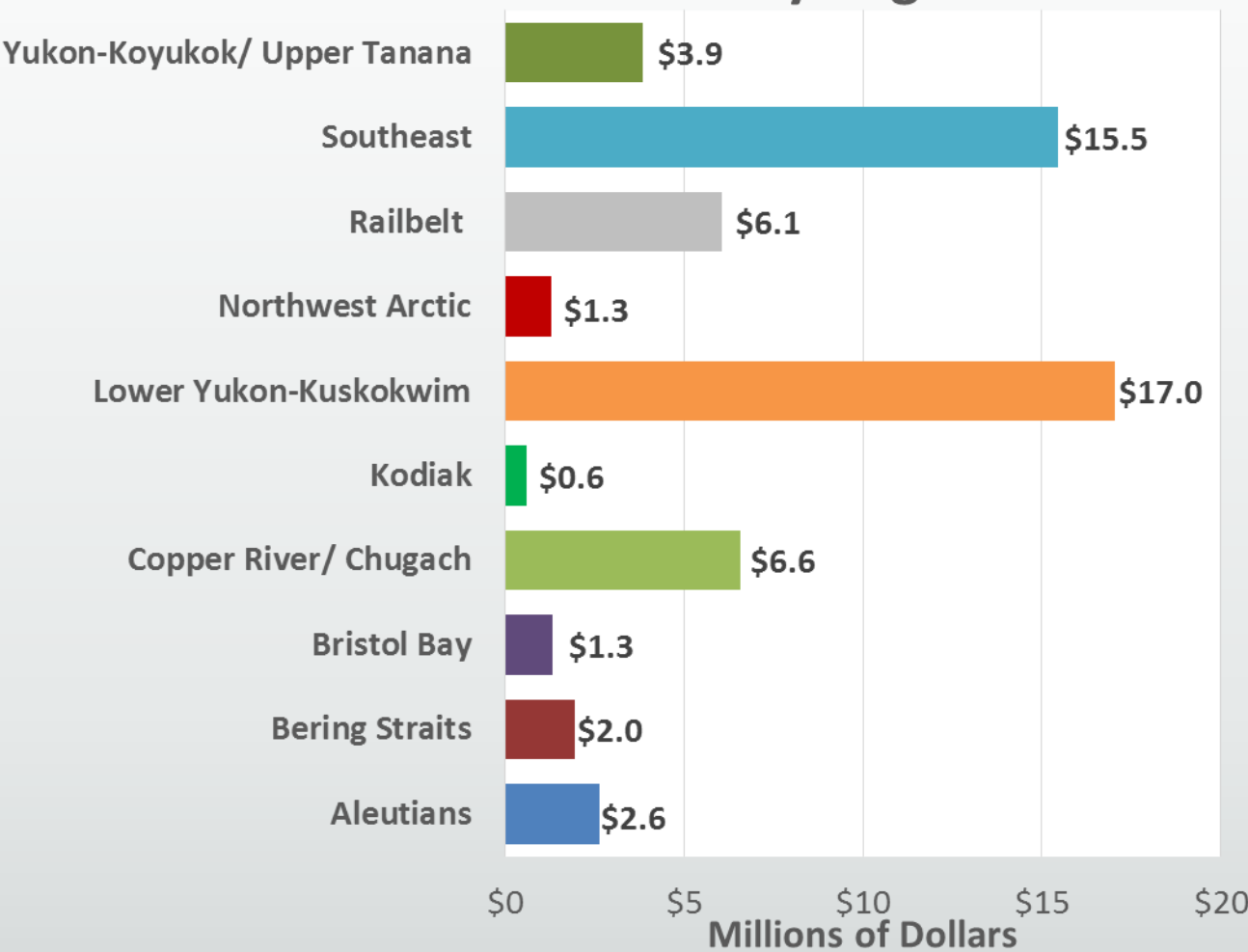


Renewable Energy Fund : Round 6 Recommendations

Recommendation by Type



Recommendations by Region



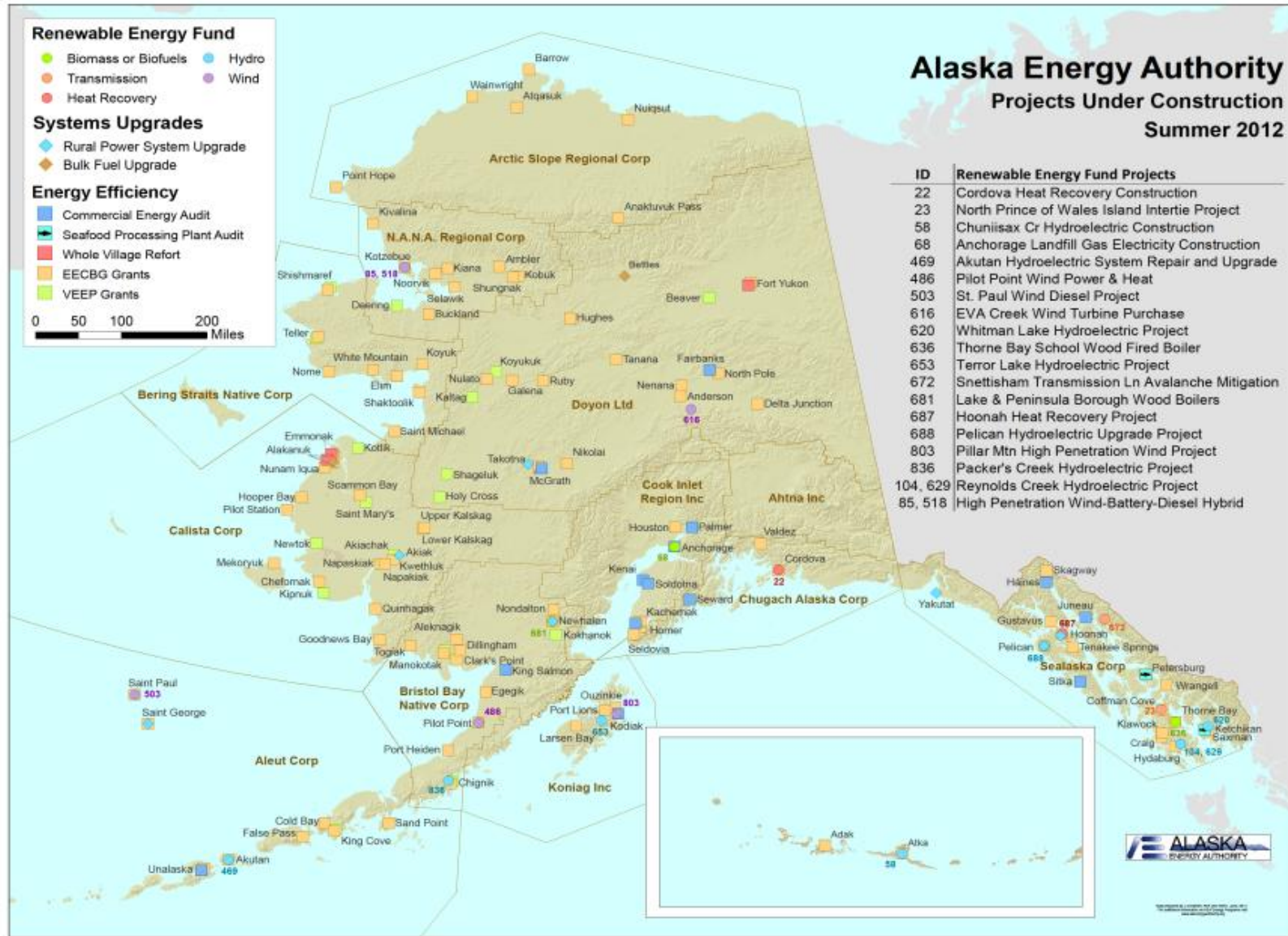
AEA: Active Energy Projects

Active Energy Projects - January 2012 thru January 2013

Prepared: January 23, 2013

Program Type	No. of Active Projects	Renewable Energy Funds	Other State Funds	Federal Funds	Total Funding
Renewable Energy Programs:					
Biomass	24	7,440,548	1,305,858	1,192,036	9,938,442
Heat Recovery - Other Diesel	10	4,956,664	567,727	271,543	5,795,934
Energy Efficiency & Conservation	20	-	5,029,132	12,053,731	17,082,864
Geothermal	8	9,793,213	76,908	91,184	9,961,305
Hydropower	40	35,382,172	25,210,755	5,128,173	65,721,101
Ocean & River Energy	3	718,175	634,925	8,571	1,361,671
Energy Generation - Transmission	25	21,662,031	70,388,208	2,402,838	94,453,077
Wind Energy	36	39,287,809	11,660,500	2,890,817	53,839,127
Solar Power	1	90,000	-	-	90,000
Emerging Energy Technology	*	-	-	-	-
Bulk Fuel Upgrades	11	-	8,827,551	13,828,679	22,656,230
Rural Power System Upgrades	27	-	25,997,441	26,345,943	52,343,384
Large Energy Development Projects:					
Susitna-Watana Hydro	1	-	76,000,000	-	76,000,000
Fire Island Wind Farm T-Lines	1	-	25,000,000	-	25,000,000
Totals:	207	119,330,612	250,699,007	64,213,516	434,243,135

* 16 projects in process of being awarded. Not active in calendar year 2012



AEA: By the Numbers

FY14 Budget Summary
Prepared: January 13, 2013

Governor's FY14 Budget (in thousands)

	Allocations	Appropriation	General Funds (UGF & DGF)	Other Funds	
OPERATING:					
Alaska Energy Authority		14,362	5,627	8,735	
AEA Owned Facilities	1,067			1,067	
AEA Rural Energy Operations	6,144		2,188	3,957	
AEA Technical Assistance	577		407	170	
Statewide Project Development, Alternative Energy & Energy Efficiency	6,574		3,032	3,541	

Language Section:

Power Cost Equalization (estimated)		40,351	7,260		
			33,091	Endowment Fund AS 42.45.070(a)	

	Allocations	Appropriation	General Funds	Other Funds	Federal Funds
CAPITAL:					
AEA Susitna-Watana Hydro		95,200	95,200		
AEA Bradley Lake Transmission Upgrade		13,700	13,700		
AEA Rural Power Systems Upgrade		12,600	9,600		3,000
AEA Renewable Energy Projects Round Six		25,000	25,000		
AEA Bulk Fuel Upgrades		8,500	6,500		2,000
AEA - Alternative Energy & Energy Efficiency Programs		2,000	2,000		
AEA - Energy Plan Implementation		1,000	1,000		
AEA - Electrical Emergencies Program		330	330		
AIDEA - Natural Gas Treatment & Distribution		50,000	50,000		

Language Sections:

Fund Capitalization - Emerging Energy Technology Fund	2,000	GF Appropriation to EETF AS 42.45.375
Fund Transfers - Renewable Energy Fund	25,000	GF Appropriation to REGF AS 42.45.045(a)
Reappropriation - Akiak to Atmautluak for Rural Power System Upgrades	1,750	Reappropriation of GF

AKEnergyAuthority.org

