



Alaska Energy Authority

Sara Fisher-Goad, executive director
Senate Finance Committee
Jan. 28, 2015

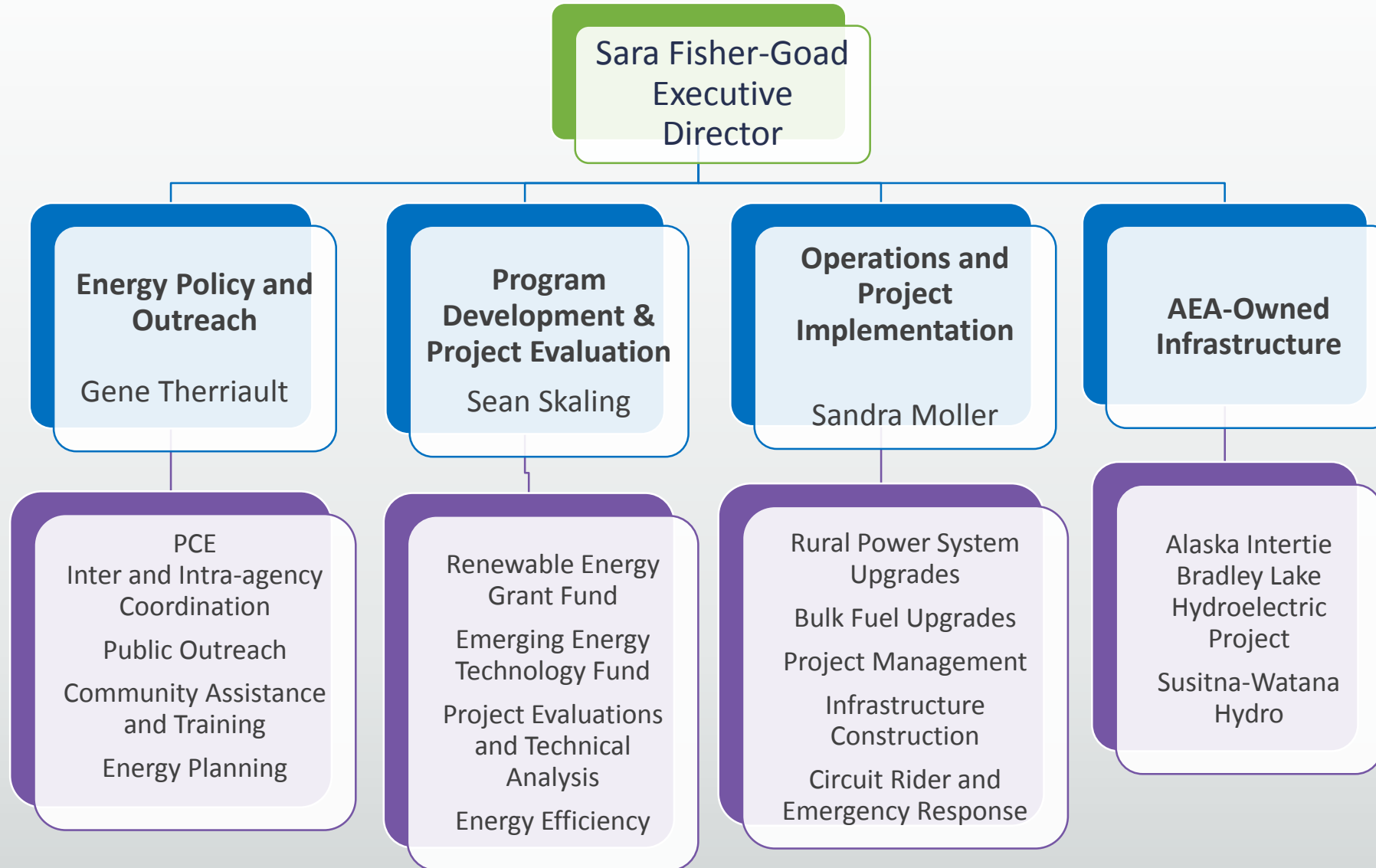


Alaska Energy Authority: Mission

“To Reduce the Cost of Energy in Alaska”

- AEA is an independent and public corporation of the State of Alaska
- Created by the Alaska Legislature in 1976
- 44.83.070: “ The purpose of the Authority is to promote, develop, and advance the general prosperity and economic welfare of the people of the state by providing a means of financing and operating power projects and facilities that recover and use waste energy and by carrying out the powers and duties assigned to it under AS 42.45.”

A Continuum of Project Development



Collaboration

- **Alaska Wind Working Group:** collaboration of government agencies, nonprofit organizations, businesses and individuals interested in identifying specific concerns and barriers to and opportunities for wind development in Alaska. About 90 participants
- **AEA Regional Energy Planning:** a way for Alaskans to determine their energy priorities and formulate a concrete, implementable, fundable energy plan. About 11 subgroups, 169 participants.
- **Alaska Energy Efficiency Partnership:** AEA-led working group led that meets quarterly to share information and capitalize on collaborative opportunities. About 40 participants.
- **Alaska Wood Energy Development Task Group:** was formed in 2005 to explore opportunities to increase the use of wood for energy and biofuels production in Alaska. 13 participating organizations
- **Energy Ambassadors:** collaboration with the U.S. Department of Energy to collectively address energy issues in Alaska, including state and federal agencies and regional partners.
- Intra-agency collaboration on energy programs
- Issue specific stakeholder groups include Power Cost Equalization, Alaska Affordable Energy Strategy, Galena Interagency Recovery Team, REAP Rural Issues Committee.

Focusing on Communities



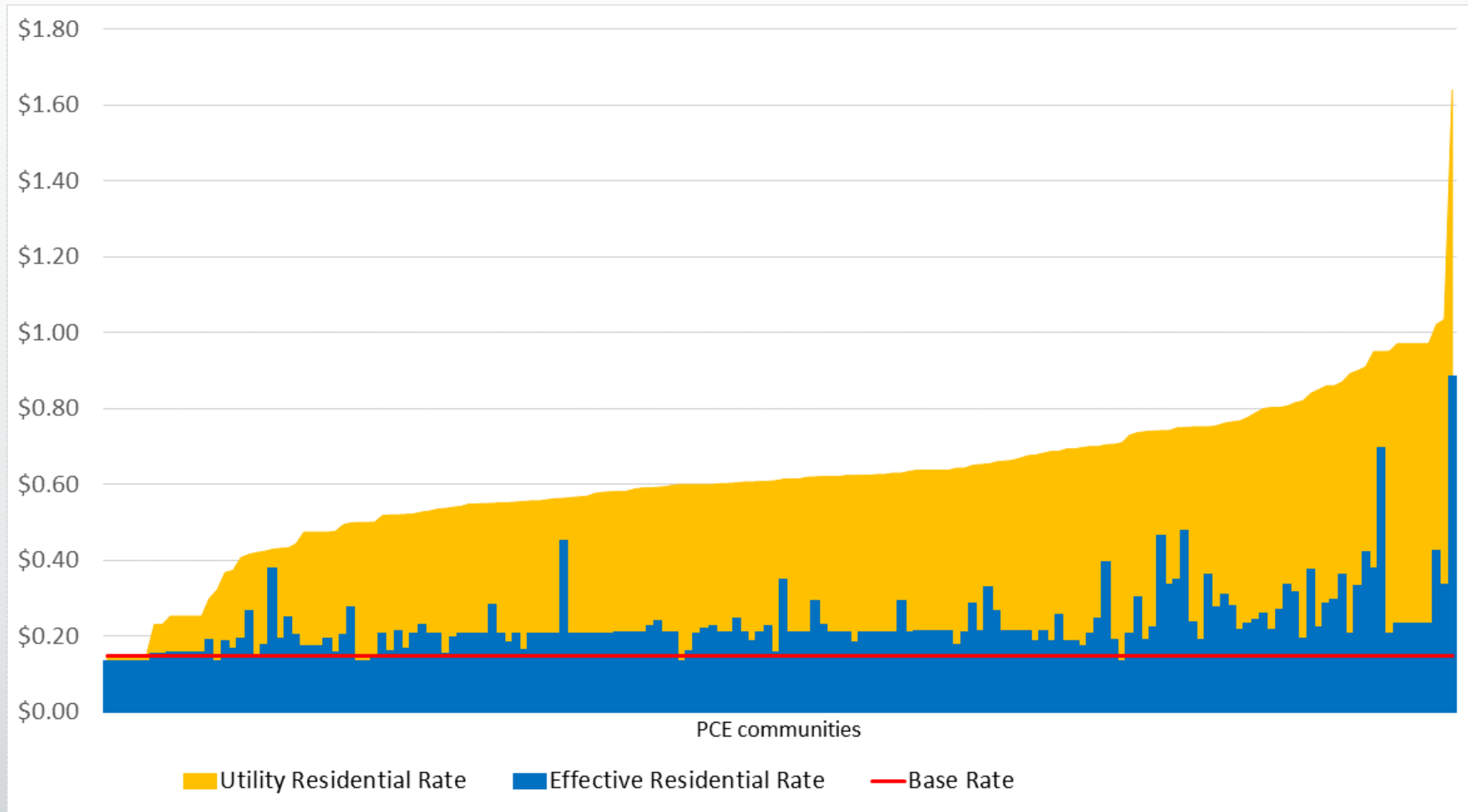
- Emphasizing community-based approach to projects
- Technical assistance, regional planning and project management
- Provide synergy between planning, projects and funding sources
- Assist communities to move to project-ready status
- Break down internal silos



Power Cost Equalization

- Provide economic assistance in rural Alaska where electrical rates can be 3 to 4 times higher than in urban Alaska
- PCE created at a time when State funds were used to construct major energy projects to serve urban areas (Four Dam Pool)
- PCE is a way for rural communities to also benefit from those projects
- Regulatory Commission of Alaska (RCA) sets rates, calculations based on use, costs and efficiencies
- The program reduced power costs an average of 55 percent for residential customers and community facilities up to 500 kWh per month.
- 2014 changed the regulations to include community facilities
- 192 participating communities
 - AEA community assistance team helped four communities reinstate in PCE during 2014
 - Only four non-participating communities

PCE Levels Rates



Regional Energy Planning

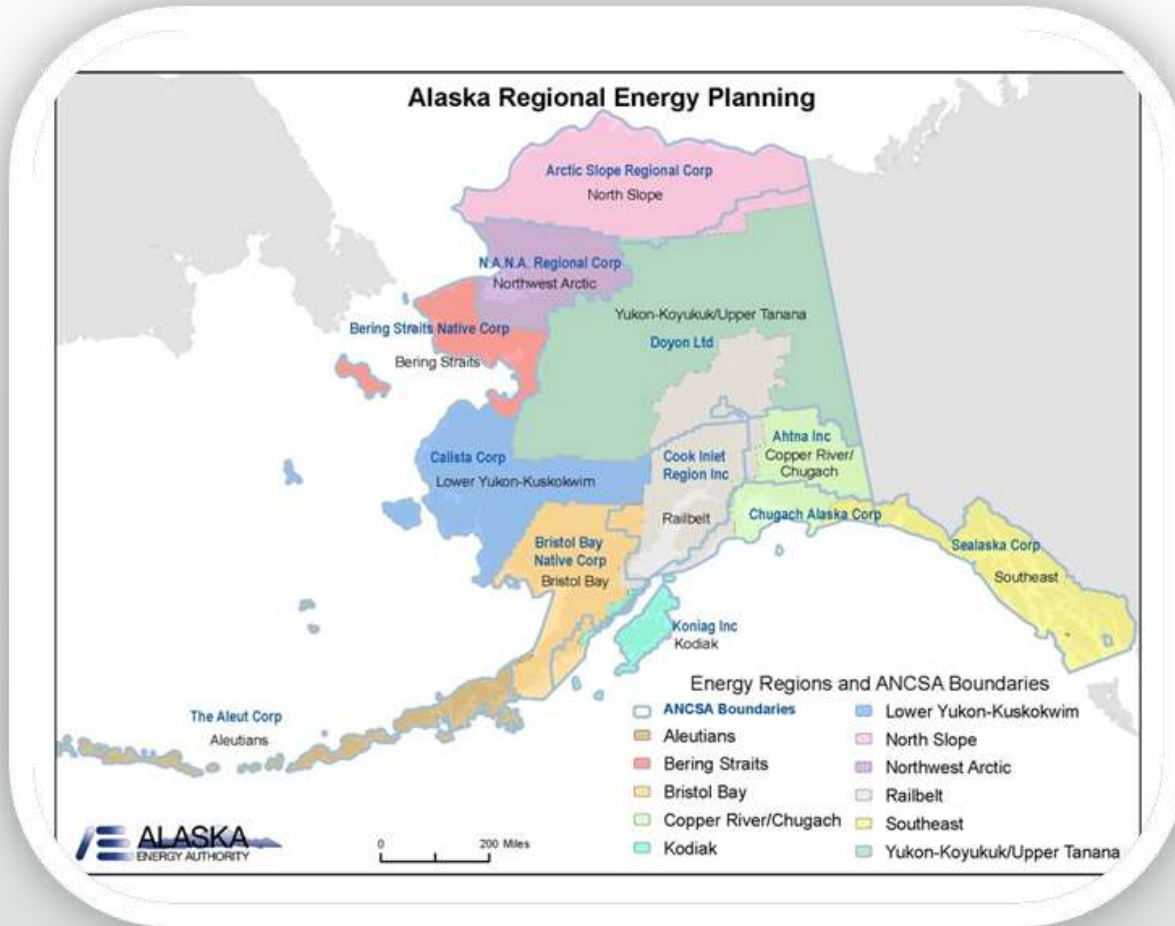
- Energy Pathways led to regional planning
- Address unique challenges while capitalizing on regional resources
- Locally driven and community-vetted blueprint for sustainability
- Provide specific, actionable recommendations
- Identify means of providing stable and affordable electric, heat and transportation energy from renewable and fossil fuels
- Build capacity at local and regional level to enable stakeholders to continue planning process

Regional Planning Process



- Provides consistent format for planning efforts
- Community-driven process with AEA project management and policy oversight
- Regional priorities not reliant on state funding
- Phased process:
 - Phase I: Information gathering and working draft development
 - Phase II: Stakeholder engagement and feedback
 - Phase III: Technical and economic analysis for final draft development and interface with AkAES

Alaska's Energy Plans



Completed plans

- Living documents
- Railbelt and Southeast Integrated Resources Plans

Ongoing plans:

- AEA-funded, most often working with ARDORs
- Kodiak, Northwest Arctic, Aleut, Bering Straits, Bristol Bay, Copper Valley, Yukon-Koyukuk/Upper Tanana (TCC led), Chugach

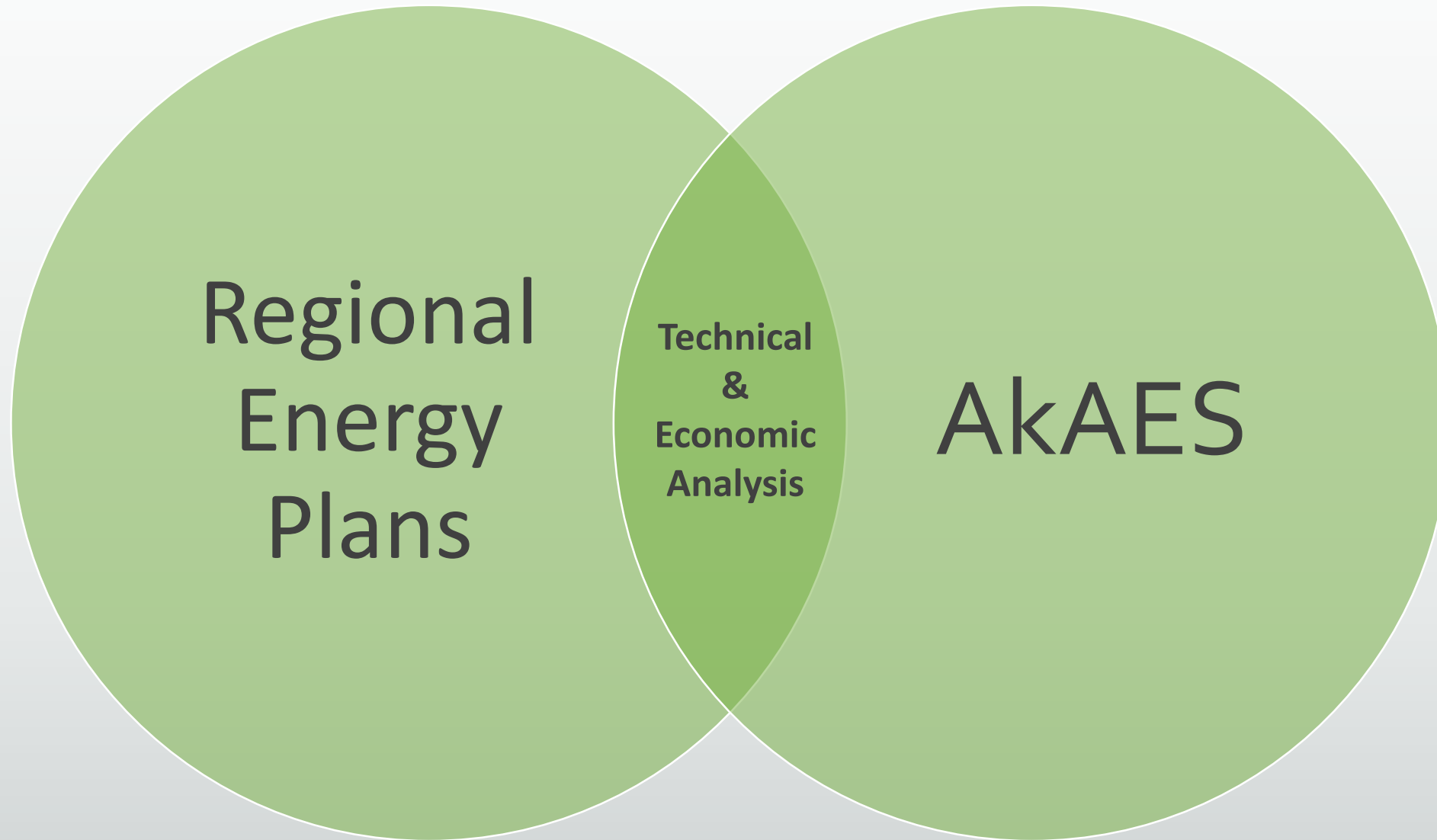
AEA Advisory Role:

- Lower Yukon-Kuskokwim (Nuvista led)
- North Slope

Regional Planning Status

Region	Contractor/Lead Entity	Phase
Aleutians	SWAMC	3
Bering Straits	Bering Straits Development Co.	2
Bristol Bay	SWAMC	2
Chugach	Prince William Sound Economic Development District	1
Copper River	Copper Valley Development Association	2
Kodiak	SWAMC	2
Lower Yukon-Kuskokwim	Nuvista (Collaboration with AEA)	2
North Slope	North Slope Borough (Collaboration with AEA)	2
Northwest Arctic	Northwest Arctic Borough	3
Yukon-Koyukuk/Upper Tanana	Tanana Chiefs Conference	2

Relationship between Planning Efforts

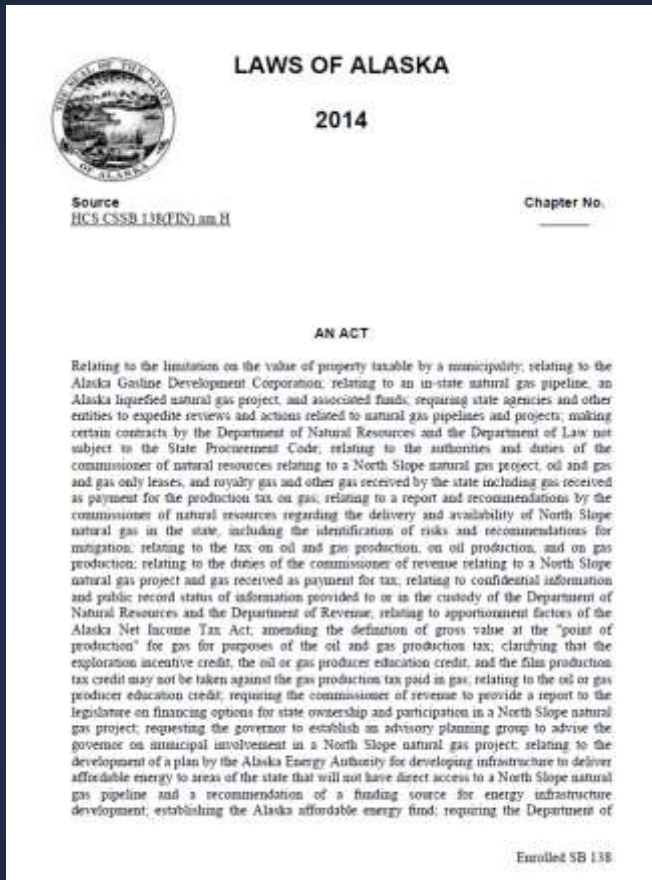


Senate Bill 138

Alaska Affordable Energy Strategy

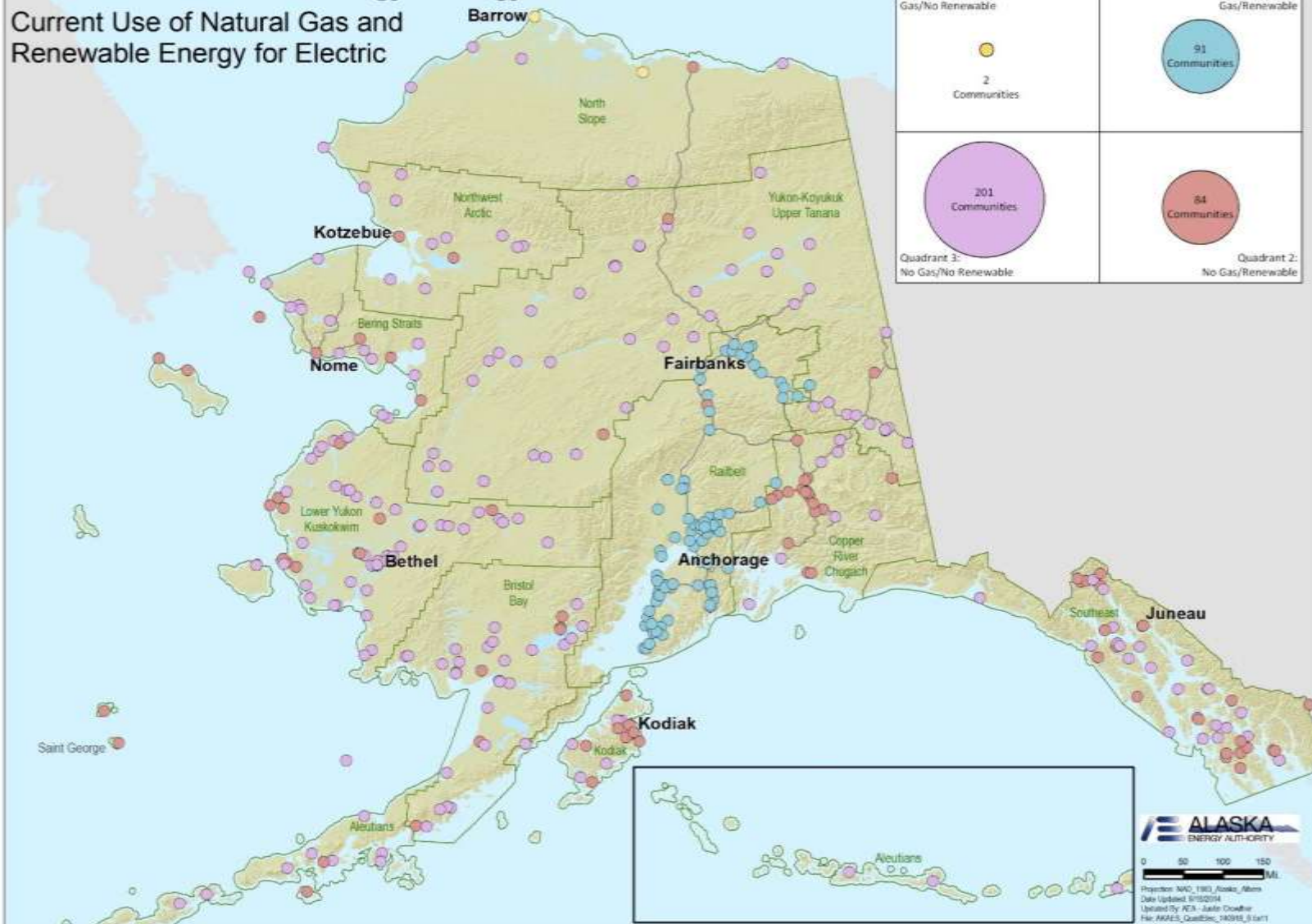
Plan and recommendations to the Legislature on infrastructure needed to deliver affordable energy to areas in the state that do not have direct access to a North Slope natural gas pipeline.

Due: January 1, 2017



The Alaska Affordable Energy Strategy

Current Use of Natural Gas and Renewable Energy for Electric



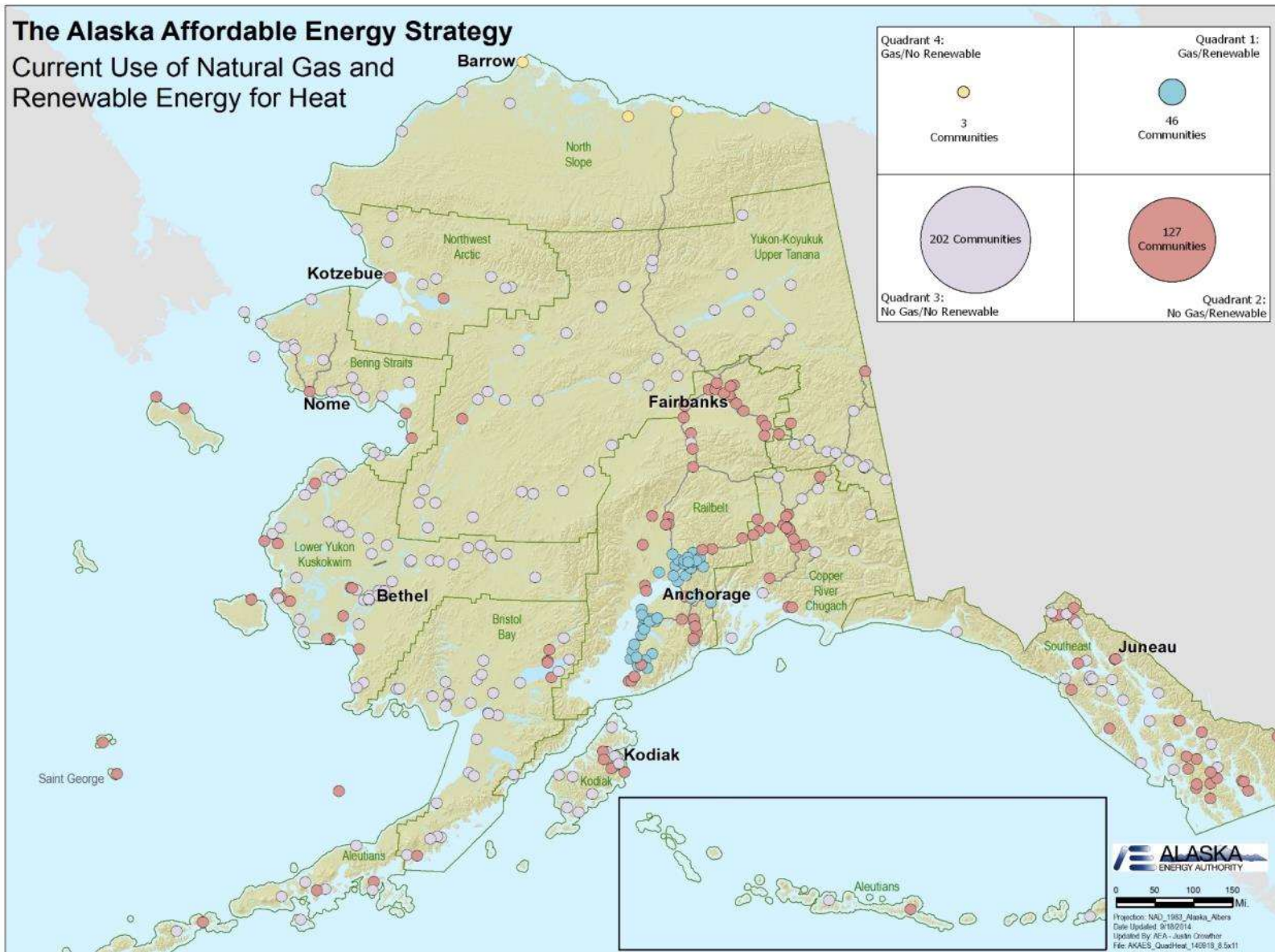
Electricity

4 Quadrants based on Access to Energy Resources:

1. Natural Gas/Renewables
2. No Natural Gas/Renewables
3. No Natural Gas/No Renewables
4. Natural Gas/No Renewables

The Alaska Affordable Energy Strategy

Current Use of Natural Gas and Renewable Energy for Heat

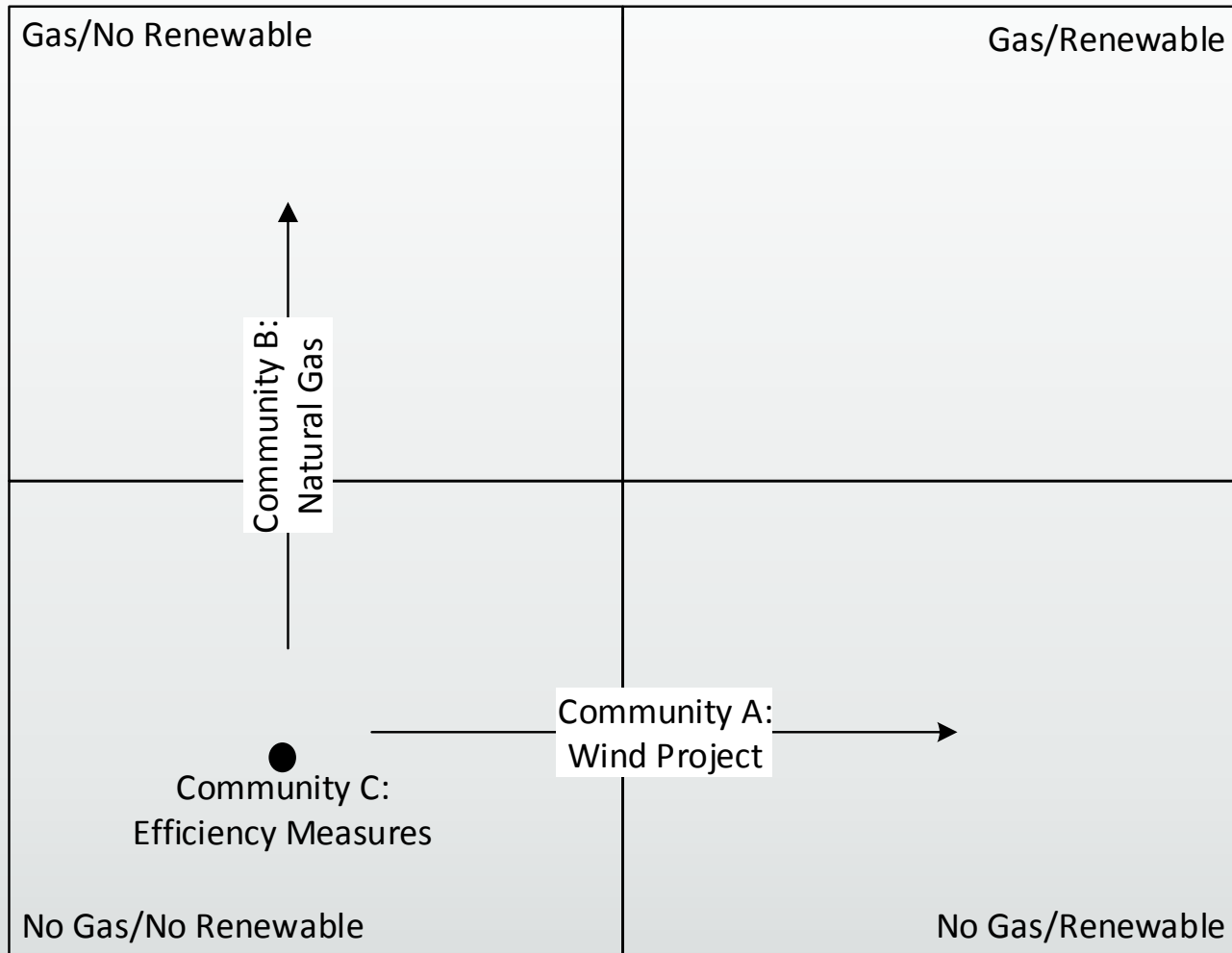


Heat

4 Quadrants based on Access to Energy Resources:

1. Natural Gas/Renewables
2. No Natural Gas/Renewables
3. No Natural Gas/No Renewables
4. Natural Gas/No Renewables

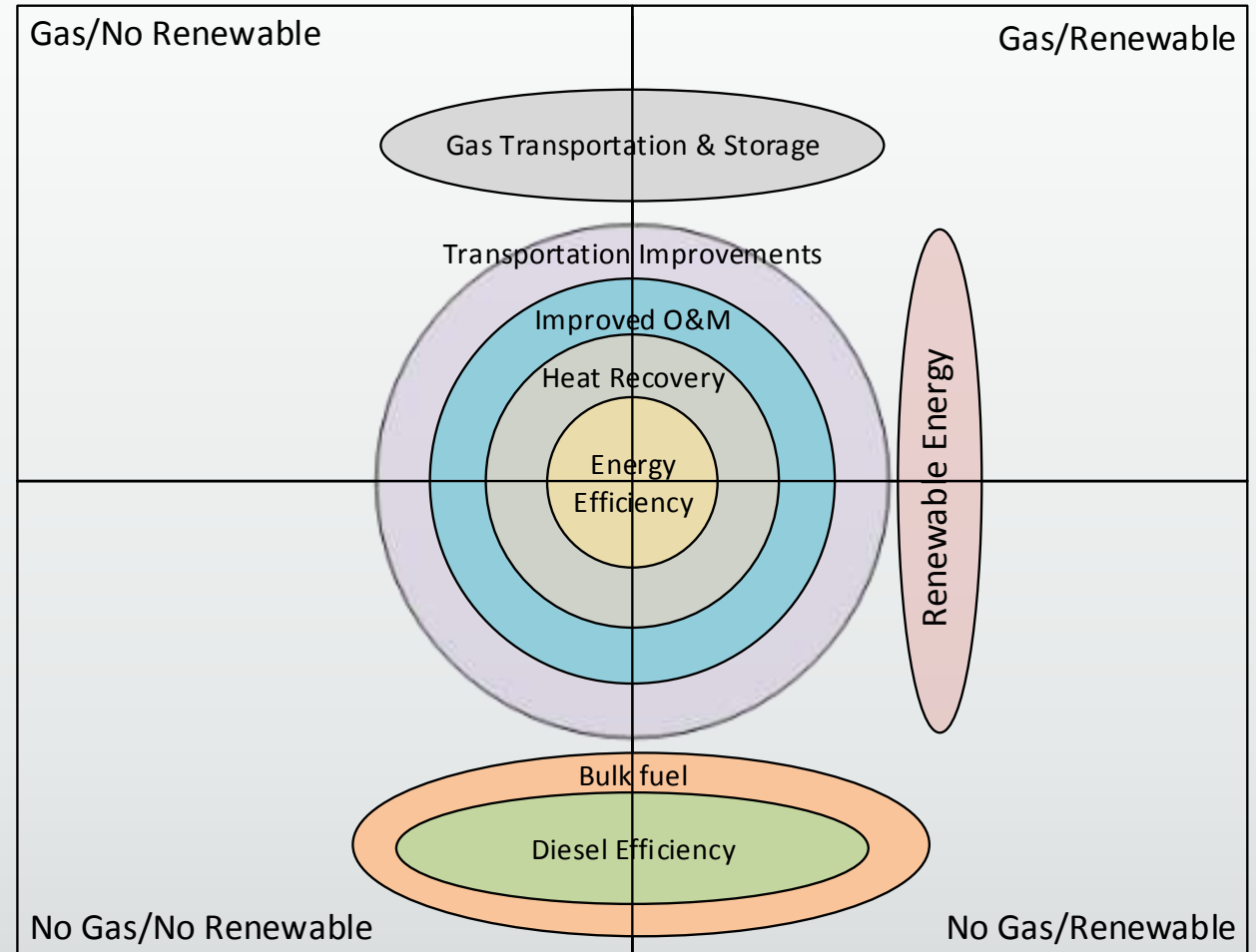
Cost Effective Measures to Improve Energy Affordability



Cost-Effective Strategies To Improve Energy Affordability

Strategies for More Affordable Energy

- Evaluate communities individually on ability to cost-effectively access to renewable energy or natural gas.
- Provide funding mechanisms, assistance, and other changes to promote cost-effective measures in communities.





Perryville: Wind



Prince Wales Island: Biomass

Renewable Energy Grant Fund

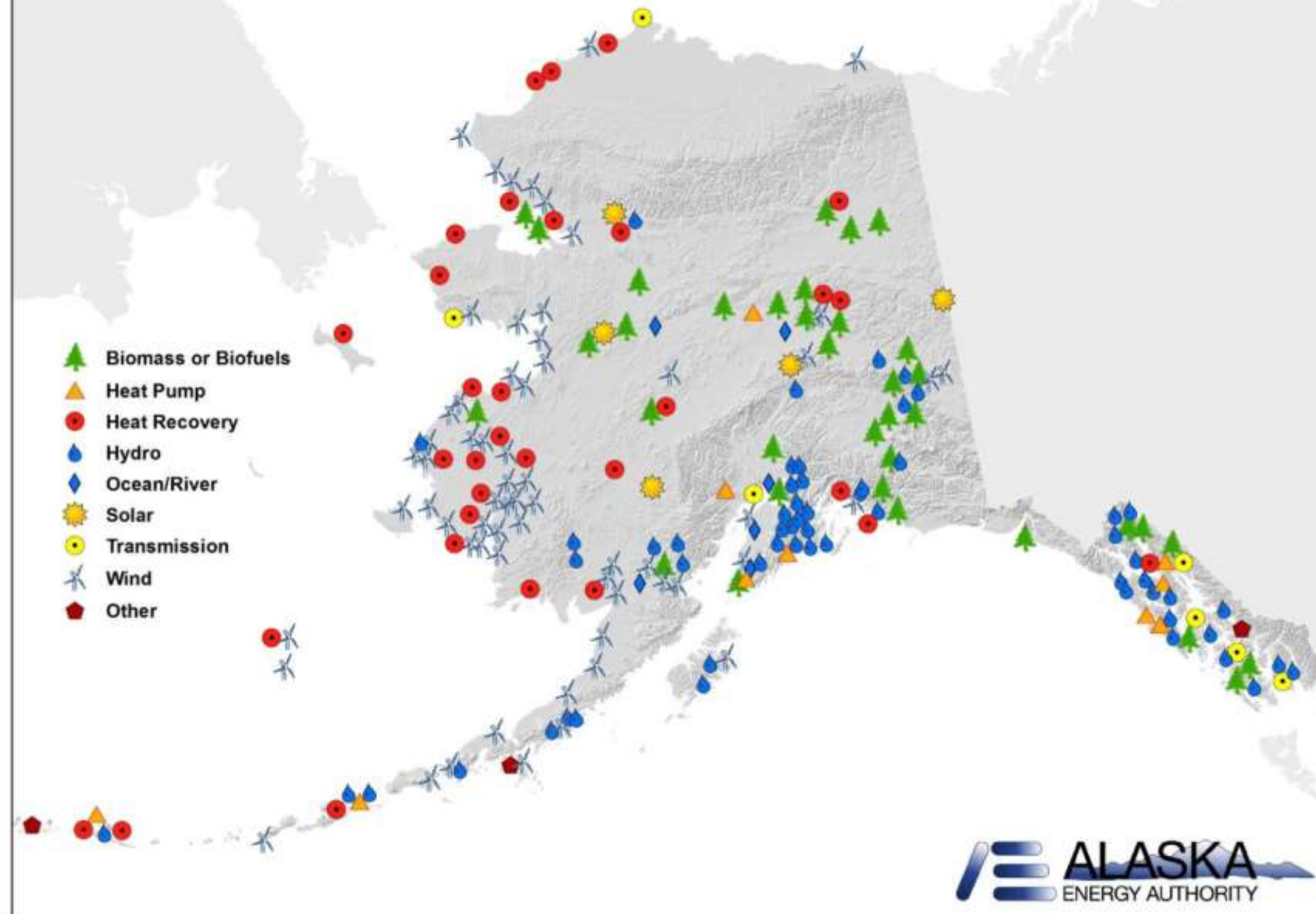
- Displaces volatile-priced fossil fuels through hydroelectric, wind, biomass, heat recovery, heat pumps, solar and transmission of renewables
- Earned national recognition for excellence from the Clean Energy States Alliance
- In 2013 13 million gallons of diesel and natural gas equivalent were displaced
- Capitalizes on local energy resources
- Benefits businesses not eligible for PCE
- Expands Alaska's renewable energy knowledge base
- Overall Program Benefit Cost Ratio: 2.8 (Based on first 44 projects in operation)

REF Grant and Funding Summary

	Totals R1-7
Applications Received	732
Applications Funded	277
Grants Currently in Place	122
Amount Requested ¹ (\$M)	\$ 1,442.3
AEA Recommended (\$M)	\$ 398.3
Appropriated (\$M) ²	\$ 247.5
Cash Disbursed (\$M)	\$ 163.3
Match Budgeted (\$M) ³	\$ 152.1

1. Total grant amount requested by all applicants.
2. \$12.8 Million was re-appropriated from earlier rounds for use in Round IV (\$10M) and Round VII (\$2.8M).
3. Represents only amounts recorded in the grant document and does not capture all other funding.

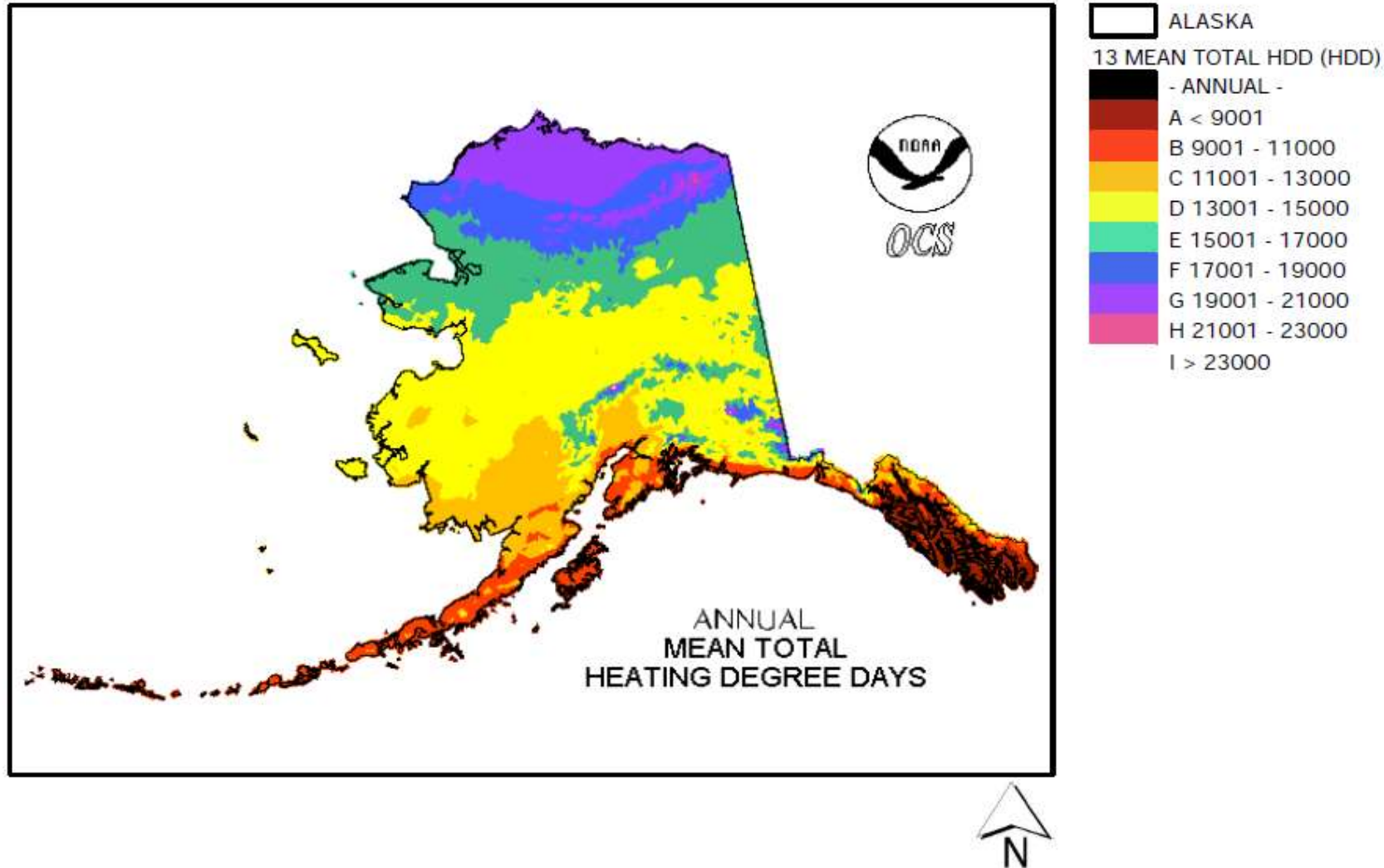
Renewable Energy Fund Projects, Rounds I - VII



Rounds I-VII Funded Projects			
	\$	Count	% \$
Southeast	54,830,472	50	22.15%
Lower Yukon-Kuskokwim	30,835,187	37	12.46%
Railbelt	30,173,642	41	12.19%
Northwest Arctic	23,203,362	14	9.38%
Copper River/Chugach	21,630,131	19	8.74%
Bering Straits	21,429,215	18	8.66%
Aleutians	17,491,232	23	7.07%
Kodiak	16,486,919	7	6.66%
Yukon-Koyukuk/Upper Tanana	15,018,377	31	6.07%
Bristol Bay	13,647,042	23	5.51%
North Slope	2,185,342	11	0.88%
Statewide	565,439	1	0.23%

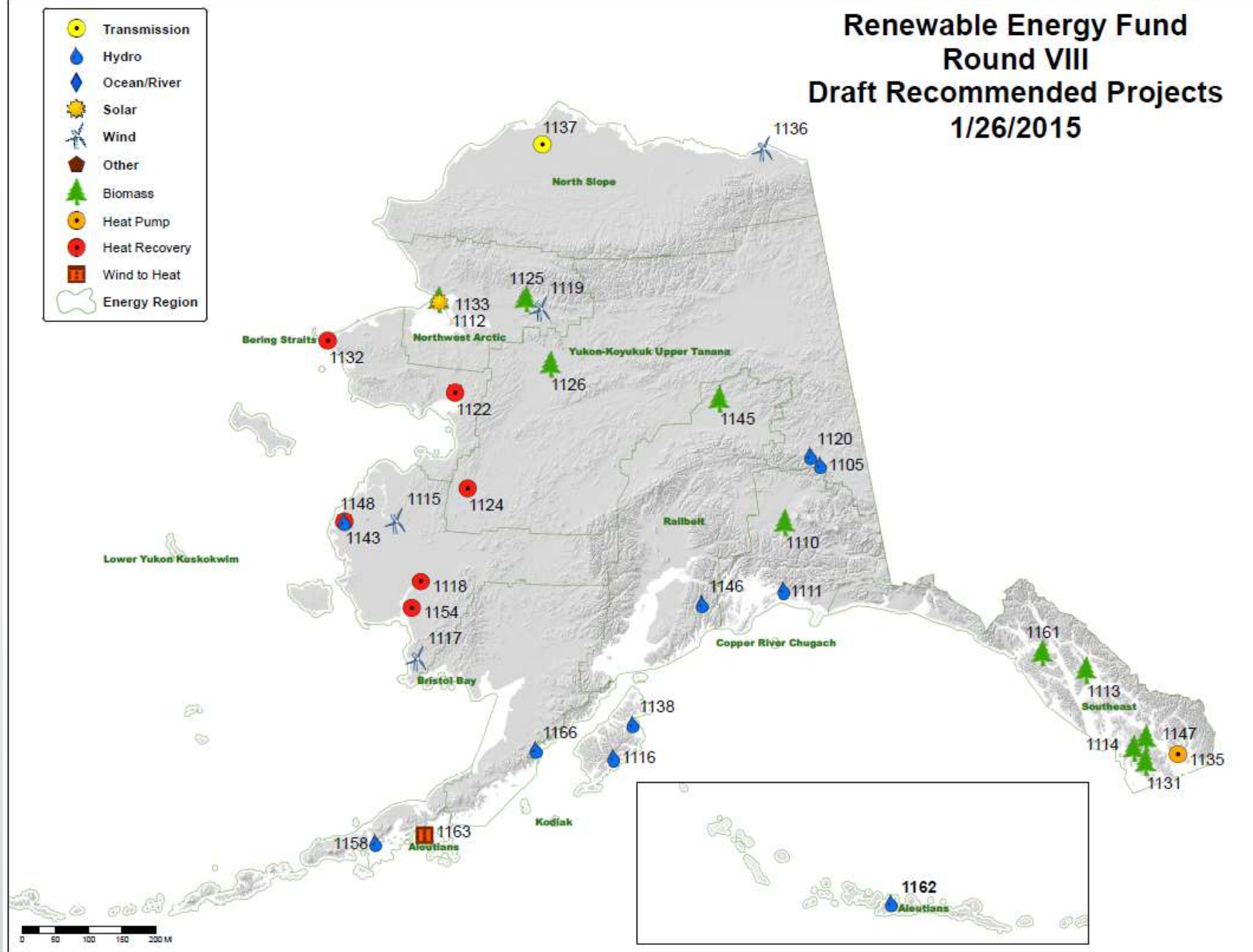
Heating Degree Days

ElDoradoCountyWeather.com



- Cold temperatures create operational challenges for utilities
- Reliable power is vital for remote communities in winter
- Climate impacts the availability of some renewable resources
- Cold temperatures increases energy use for heating

Renewable Energy Fund Round VIII Draft Recommended Projects 1/26/2015





Fairbanks Ground Source Heat



ORPC Turbine in the Kvichak River

Emerging Energy Technology Fund

- Provides funds for projects that can demonstrate commercial viability within 5 years
- Includes renewable and alternative energy, storage and transmission
- Nearly \$11 million provided to 20 projects
- Projects in Juneau, Fairbanks, Kodiak, Delta Junction, Nenana, Nikiski, Igiugig, Tuntutuliak, Kwiglingok and Kotzebue
- Program extended to 2020
- Fills an energy development void by providing infusion of capital to spur private investment in emerging technology
- Synergy between state and business community
- Supports a growing Alaska energy industry
- Partner with ACEP on data collection



Modified '97 Eagle Talon EV test bed



Modified 15 kW genset

EETF: Project Highlight

Ultra-Efficient Generators and Diesel Electric Propulsion (Kodiak)

- Technology aims to provide more efficient diesel power generation
- Can be used in marine propulsion and stationary powerhouses
- Power dense motor and inverter/controller invented by operators of a machining and fabricating shop in Kodiak
- Commercial availability anticipated at project's end

Energy Spotlight on Alaska



Energy Efficiency and Conservation



State goal to reduce per capita energy use by 15% by 2020

- AEA's focus: commercial buildings, rural public buildings, industrial facilities and electrical efficiency
- Statewide outreach and education AKEnergyEfficiency.org
- Coordination between State agencies

Results:

- \$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

Village Energy Efficiency Program



Kiana: Fire House Weatherization



King Cove: LED Light Fixtures

- Provides grant funding for small, high-energy cost communities to implement energy efficiency and conservation measures in the public buildings and facilities.
- Eligible applicants include:
 - Municipalities, cities, school districts, unincorporated villages, Alaska Native regional and village corporations, tribal consortiums, regional housing authorities, traditional councils
- 2013: Seven projects received \$1,381,000
- Projects include retrofitting lights, replacing outdated HVAC equipment and boilers, improving insulation and building siding and replacing windows.

Revisiting Nightmute

- Revisited Nightmute as a collaborative model
- Multiple state partners, regional organizations, the city of Nightmute and private sector
- Multiple energy efficiency efforts simultaneously implemented in the community in 2009
- After five years:
 - the average house and community building cut energy use in half
 - projected annual fuel savings to the village store alone were estimated at \$10,639
 - community lighting upgrades resulted in more than \$14,000 in annual estimated savings
 - total annual energy savings for the community was calculated around \$75,000.



Listening Session with the Community



Nightmute Partners Gathering

Bulk Fuel and Rural Power System Upgrades

- Help utilities improve efficiency, safety and reliability of power systems
 - Promote local hire and training
- Completed about \$340 million in rural bulk fuel and rural power system upgrade projects since 2000, in partnership with Denali Commission
- Circuit Rider program provides mechanical training
 - 28 circuit rider visits to communities and approximately 3,300 phone assistance instances
- Emergency response stabilizes power during lights out or near-emergency situations
 - Four emergencies in calendar year 2014
- Looking at training models to increase local capacity



RPSU Savings to Communities

Effective Rate Reduction
(\$/kWh)



- Average weighted rate savings to the community: 19 cents per kilowatt hour
- Average annual debt service savings to the community: \$149,000
- Assumptions: 5% interest rate, 20-year life for RPSU Capex, Utility Costs are 50/50 fuel/non-fuel

Susitna-Watana Hydro

- Safe and Effective Field Work
 - Data collection complete for 13 FERC-approved studies
 - Advancing the state of science for agencies to better manage resources
- Filed the Initial Study Report with FERC
- Report to the Legislature Distributed Jan. 20
- Data Collection and Findings Similar to 1980s effort
 - Fish distribution
 - Geomorphically stable river system
 - Bird migration and breeding



Susitna-Watana Hydro: Artist's Rendering



Fisheries Work on the Susitna River

Chinook Salmon and Devils Canyon

Tagged Chinook Salmon and Devils Canyon

Only one salmon species has been documented within 30 miles of the project site.



- Salmon spawn in tributaries and off-channel habitats
- Chinook salmon only anadromous fish documented above Devils Canyon
 - Less than half of a percent of the total Susitna River Chinook escapement
- 97 to 99% of tagged Chinook spawned in the tributaries
- 93 to 97% of Coho tagged in the Lower River spawned in tributaries

Engineering and Costs

- Board of Consultants endorsed Roller Compacted Concrete and dam configuration
- 2014 drilling confirmed no active faults found at the proposed dam site
- Mean annual energy- 2,800 gigawatt hours
- Most probable cost \$5.65 billion (range \$5 to 6.2 billion)
- Combination of debt financing options can provide 50-year average wholesale power at about 7 cents per kilowatt hour
- Cost of power would equal natural gas within 9 years

AEA Budget Summary

Alaska Energy Authority
FY2016 Governor's Budget Summary
Updated January 26, 2015

FY2016 - Work in Progress Budget - Released December 15, 2014							
OPERATING:	Allocations	Appropriation	Unrestricted General Funds (UGF)	Designated General Funds (DGF)	Other Funds	Federal Funds	Notes
Alaska Energy Authority		14,807,000	2,763,400	3,308,200	8,463,500	271,900	
AEA Owned Facilities	1,067,100		-	-	1,067,100	-	
AEA Rural Energy Operations	6,434,500		1,380,800	1,096,800	3,726,900	230,000	
AEA Technical Assistance	576,700		406,700	-	170,000		
Statewide Project Development, AEE	6,728,700		975,900	2,211,400	3,499,500	41,900	
Language Section:							
Power Cost Equalization (estimated)		41,355,000		41,355,000			Endowment Fund AS 42.45.070(a)
Federal Receipts for EETF data collection		345,000				345,000	
Debt & Other Obligations:							
Kodiak Electric Association (Nyman co-gen plant)		943,676	943,676				Debt Service AS 42.45.065
Copper Valley Electric (cogeneration projects)		351,180	351,180				Debt Service AS 42.45.065
Fund Transfers - Renewable Energy Fund		15,000,000	15,000,000				GF Appropriation to REGF AS 42.45.045(a)
FY2016 - Governor Endorsed Budget - January 22, 2015							
CAPITAL:	Reappropriation	Appropriation	Unrestricted General Funds (UGF)	Designated General Funds (DGF)	Other Funds	Federal Funds	Notes
AEA Renewable Energy Projects Round Eight		15,000,000		15,000,000			
Reappropriation for AEA - Alternative Energy and Energy Efficiency Programs - NTE	2,200,000						
Reappropriation for AEA - Kake Rural Power System Upgrade Project - NTE	1,070,000						
Reappropriation for AEA - Port Heiden Rural Power System Upgrade Project - NTE	4,000,000						
Reappropriation for AEA - Tuluksak Bulk Fuel Upgrades - NTE	3,900,000						
Reappropriation for AEA - Electrical Emergencies Program - NTE	330,000						
Fund Capitalization - Emerging Energy Technology Fund	1,000,000						AS 42.45.375

AKEnergyAuthority.org

