



# Alaska Energy Authority

Sara Fisher-Goad, executive director  
House Energy Committee  
Feb. 10, 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.”

# Focusing on Communities



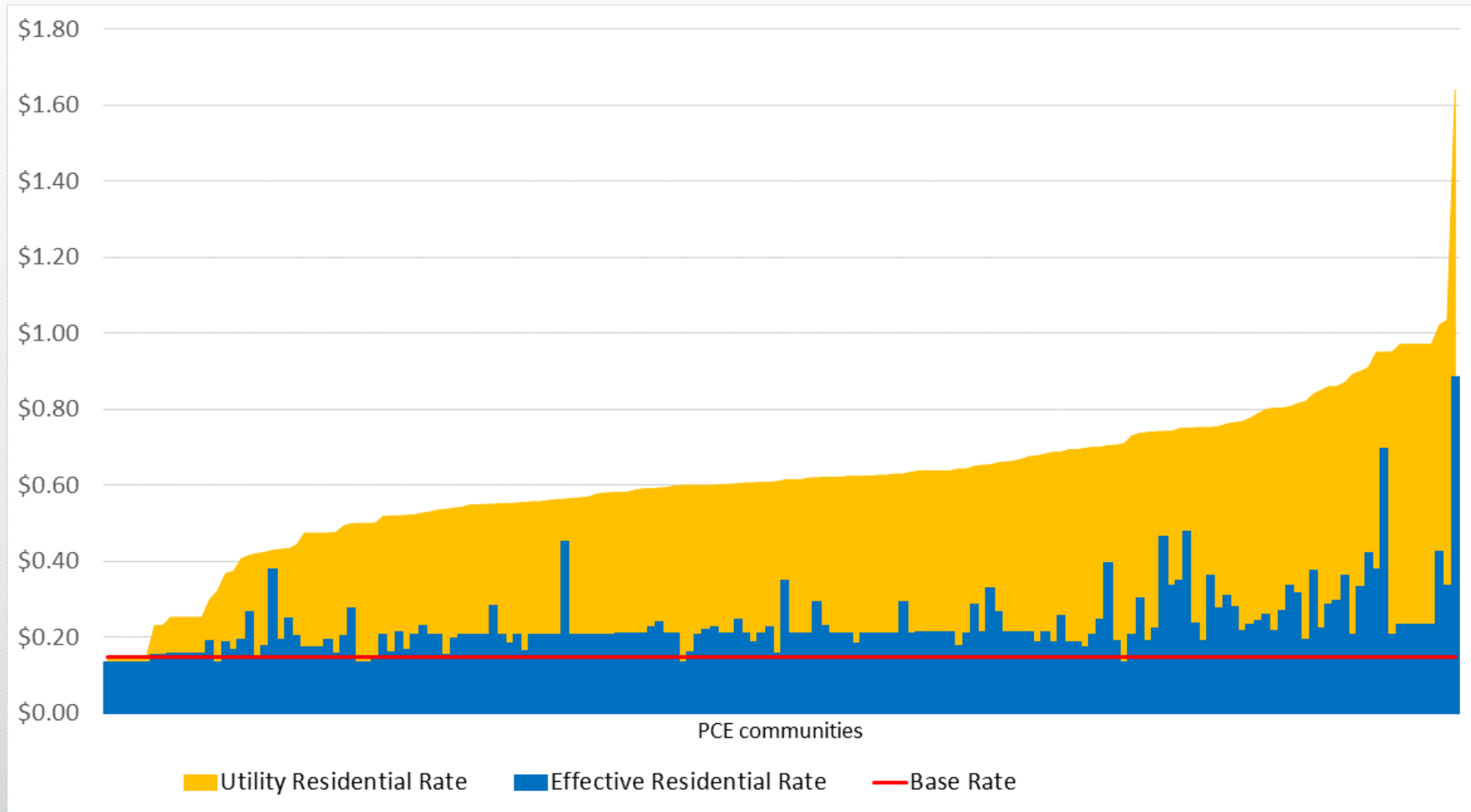
- Emphasizing community-based approach to projects
- Technical assistance, regional planning and project management
- Provide synergy between planning, projects and funding sources
- Assist communities to move to project-ready status
- Break down internal silos



# 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

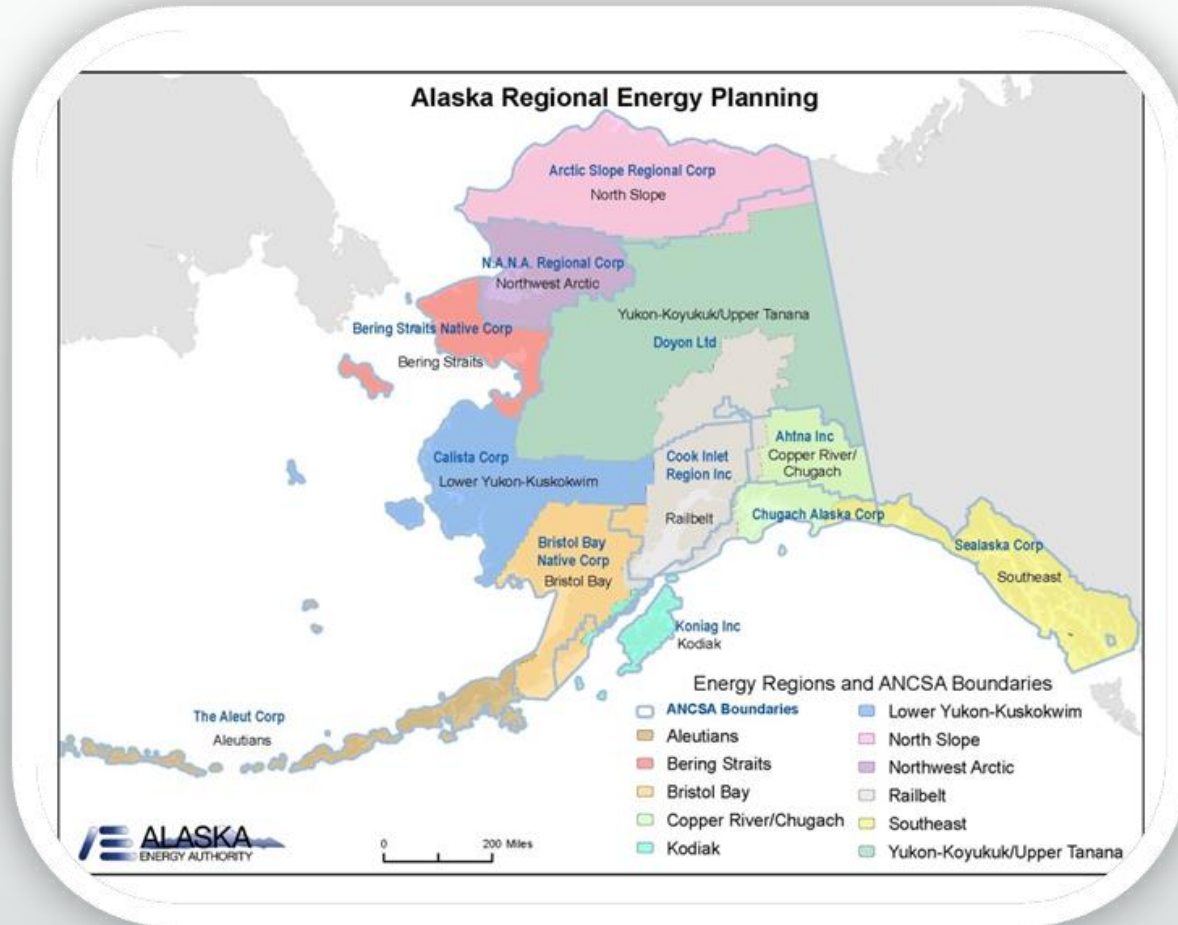


# Regional Energy Planning

- 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



# 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:

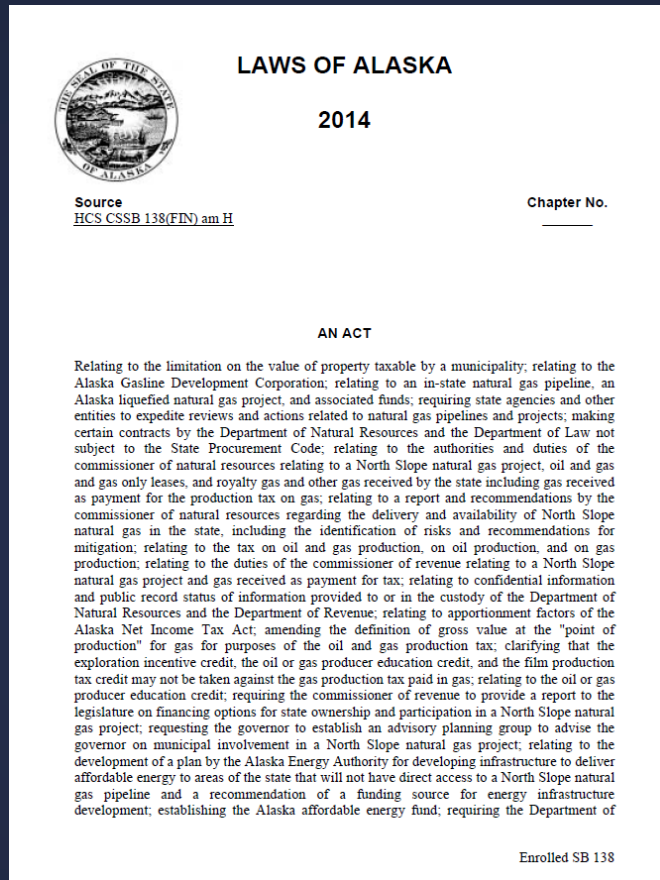
- Lower Yukon-Kuskokwim (Nuvista led)
- North Slope

# 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.

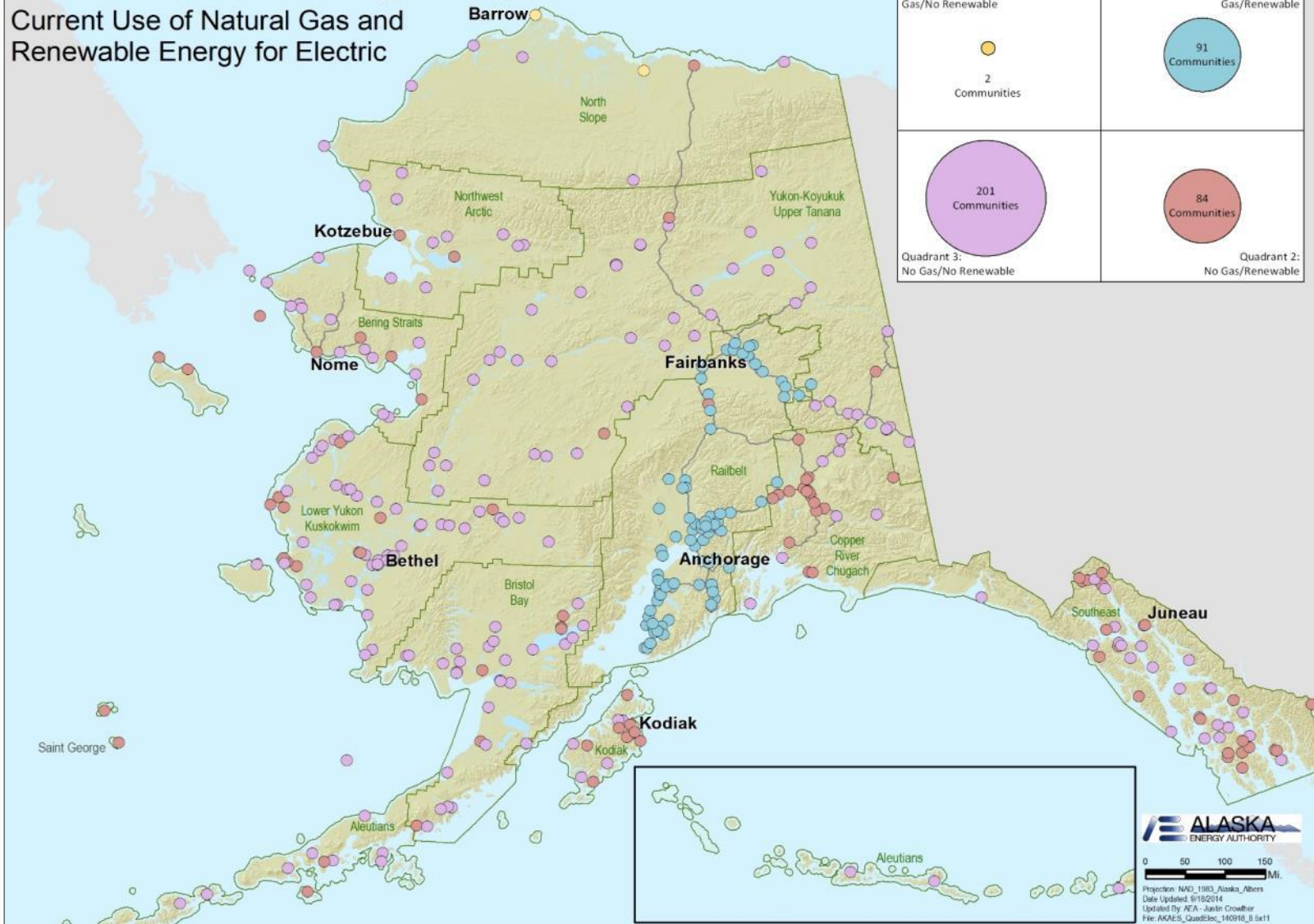
Due: January 1, 2017





## The Alaska Affordable Energy Strategy

Current Use of Natural Gas and Renewable Energy for Electric



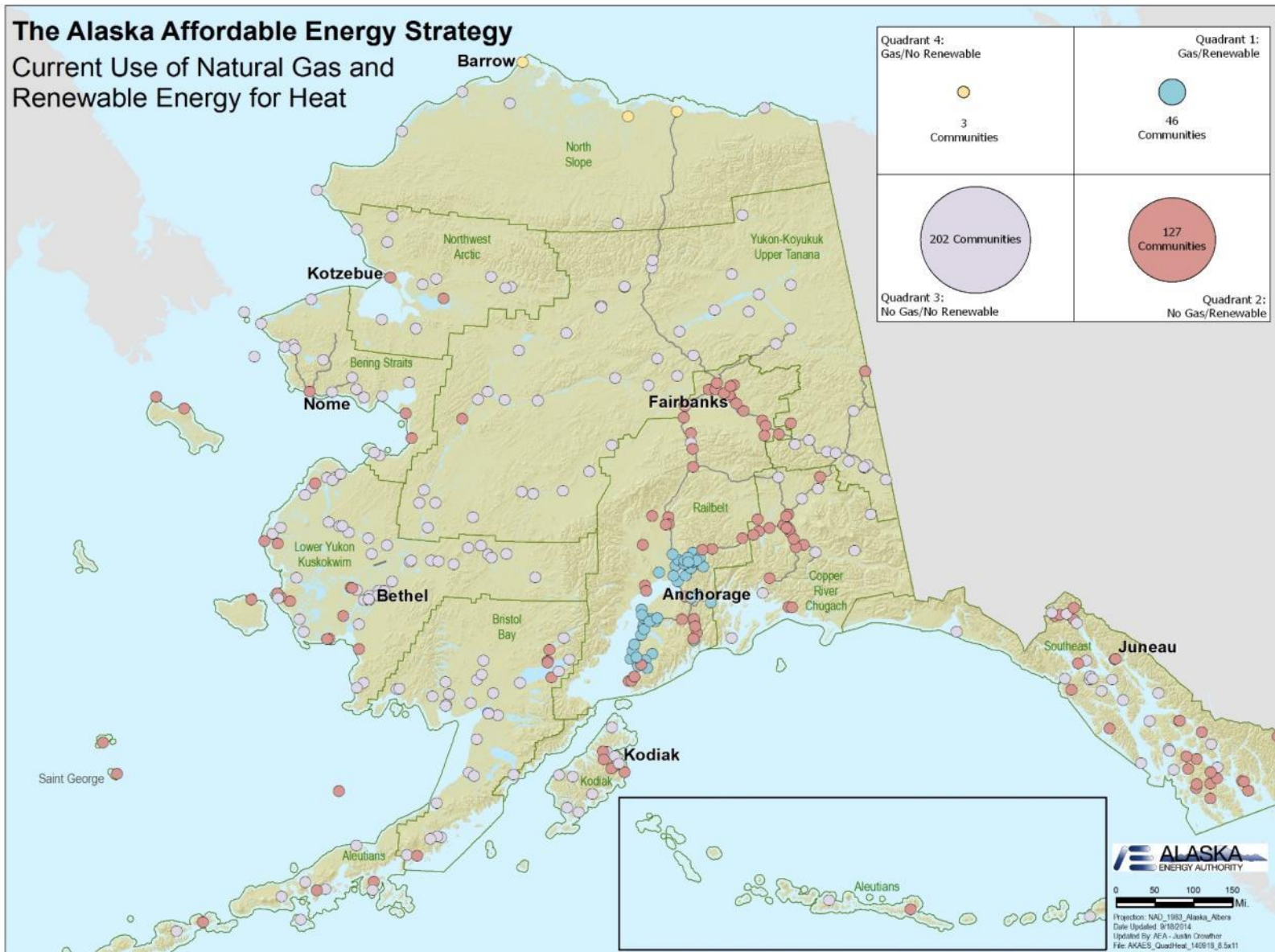
## Electricity

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



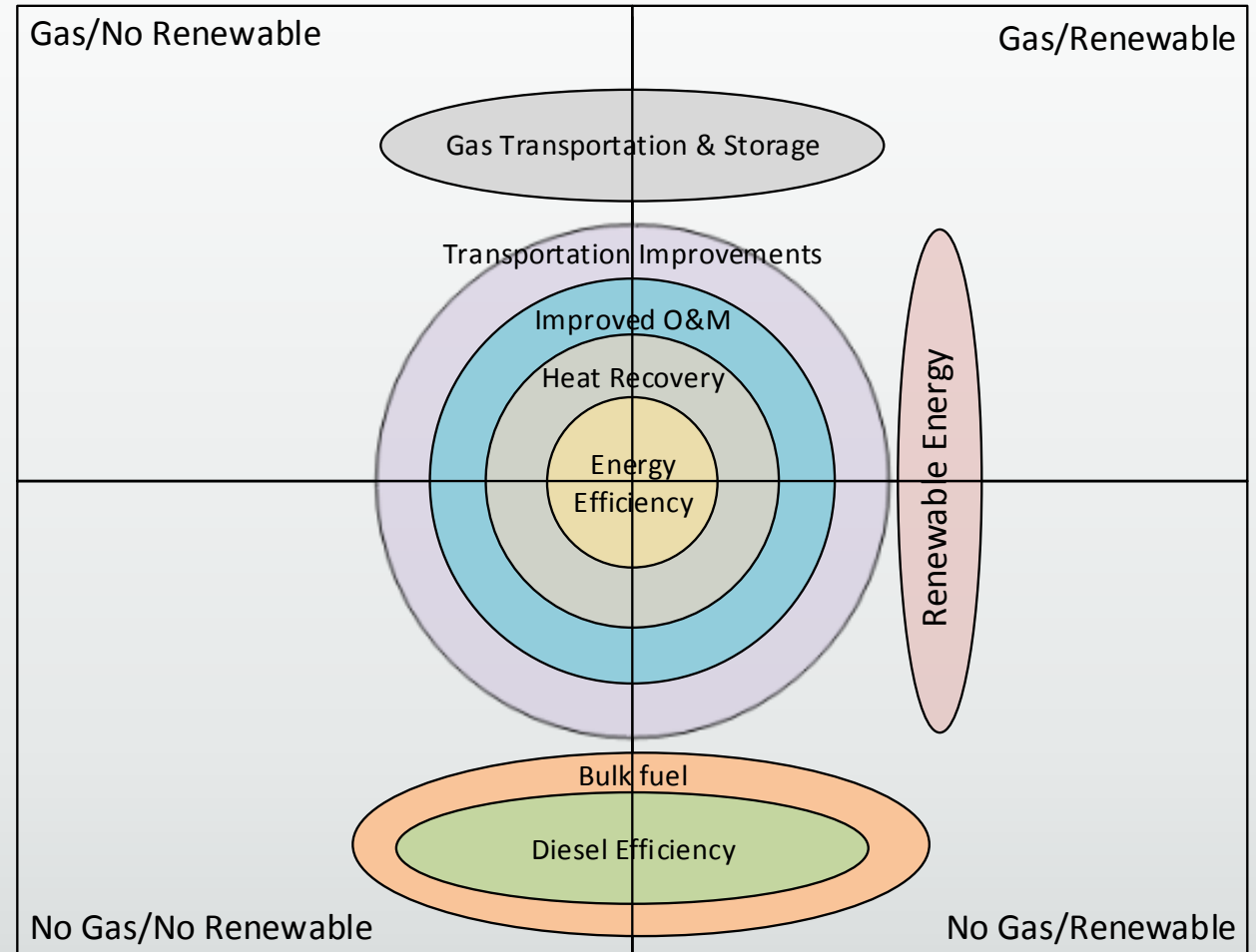
# Heat

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

# 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.





# 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](http://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

# 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



*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

# Susitna-Watana Hydro

- Report to the Legislature Distributed Jan. 20
- Will provide about 50% Railbelt electricity
- SB 42 authorized AEA to pursue licensing
- Long-term, stable rates
- 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
- Data Collection and Findings Similar to 1980s effort
  - Fish distribution
  - Geomorphically stable river system
- Can provide wholesale power at 50-year average \$.06/kWh



*Susitna-Watana Hydro: Artist's Rendering*



*Fisheries Work on the Susitna River*



# Renewable Energy Grant Fund

- Grant recommendation program supports communities
- Helps achieve state renewable goal 50% by 2025
- Displaces volatile-priced fossil fuels
- Provides a vetting mechanism for energy projects
- Capitalizes on local energy resources
- Expands Alaska's renewable energy knowledge base
- Provides local employment
- Benefits businesses not eligible for PCE
- Reduces State expenses through Schools and PCE



Coffman Cove School Garn boiler.

*Photo courtesy of Karen Petersen*

# Renewable Energy Grant Fund

- Strong technical and economic evaluation process
- Emphasis on high cost areas and regional balance
- Eligible applicants:
  - Utilities, local governments, tribal councils, Independent Power Producers
- Eligible projects:
  - Wind, hydro, biomass, heat recovery, heat pumps, geothermal, solar, wave, tidal, river hydrokinetic, landfill gas, local natural gas, transmission of renewables



St. Paul Island Wind and Flywheel

# Renewable Energy Fund Achievements



*Atka: Hydro*



*Prince Wales Island: Biomass*

- Earned national recognition for excellence from the Clean Energy States Alliance, 2014
- In 2014 15 million gallons of diesel equivalent were displaced
- Overall program benefit cost ratio: 2.8
- Leveraged more than \$200 million of other investments
- First 44 constructed projects have lifetime benefit of \$889 million (NPV)

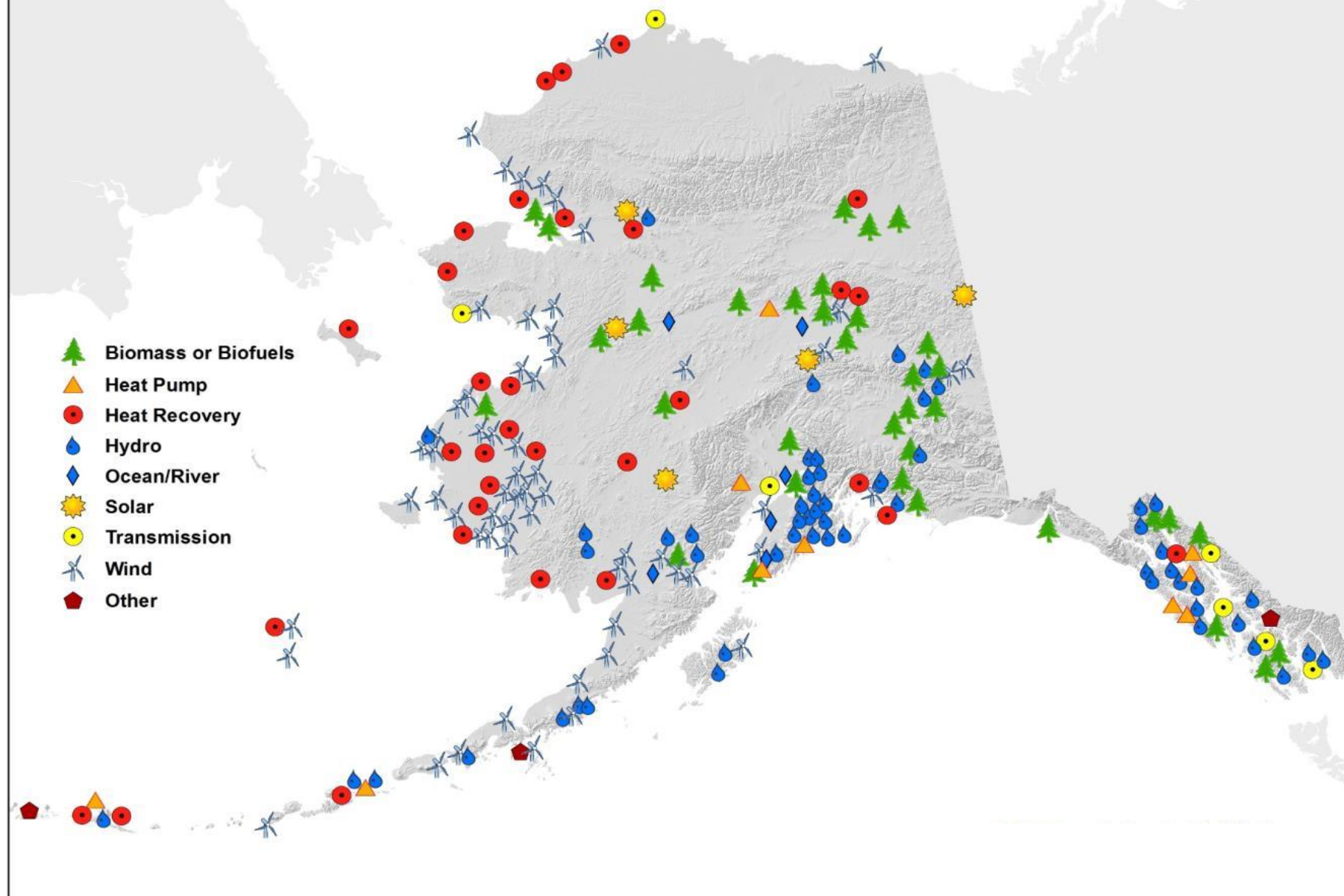


# REF Grant and Funding Summary

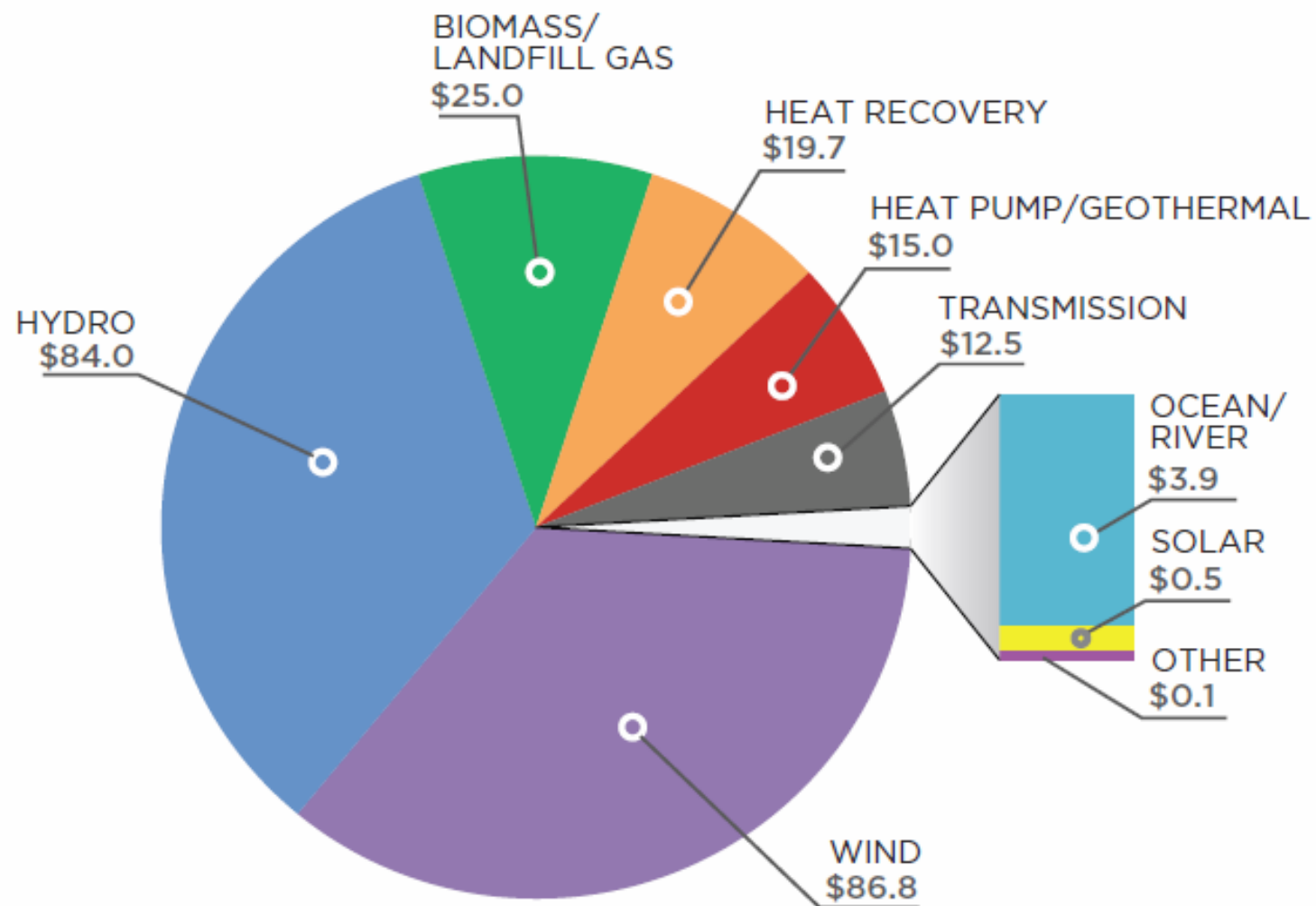
	Rounds I-VII
Applications Received	732
Applications Funded	277
Grants Currently in Place	125
Amount Requested <sup>1</sup> (\$M)	\$ 1,442.3
AEA Recommended (\$M)	\$ 398.3
Appropriated (\$M) <sup>2</sup>	\$ 247.5
Match Budgeted (\$M) <sup>3</sup>	\$ 152.1
Cash Disbursed (\$M)	\$ 167.9

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.

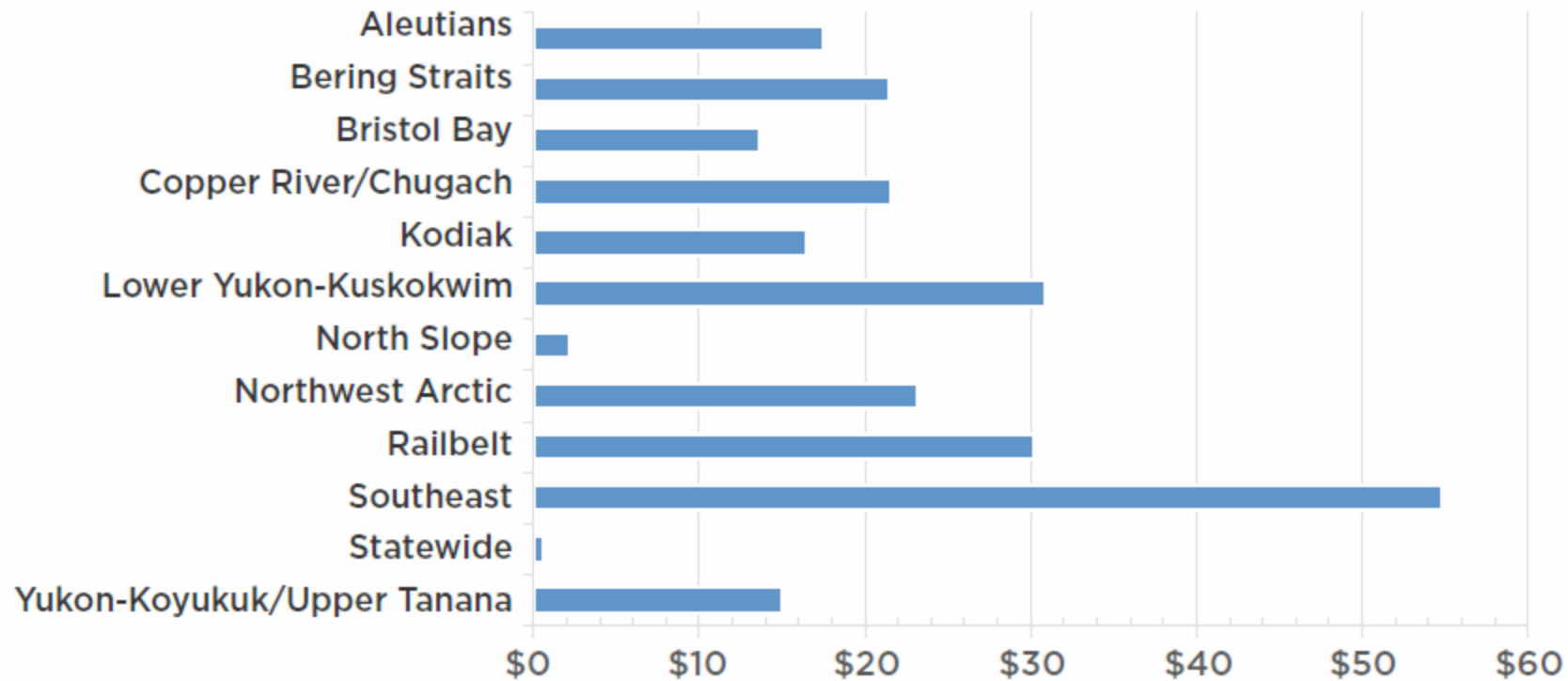
## Renewable Energy Fund Projects, Rounds I - VII



## FUNDED GRANTS BY ENERGY RESOURCE ROUNDS I-VII

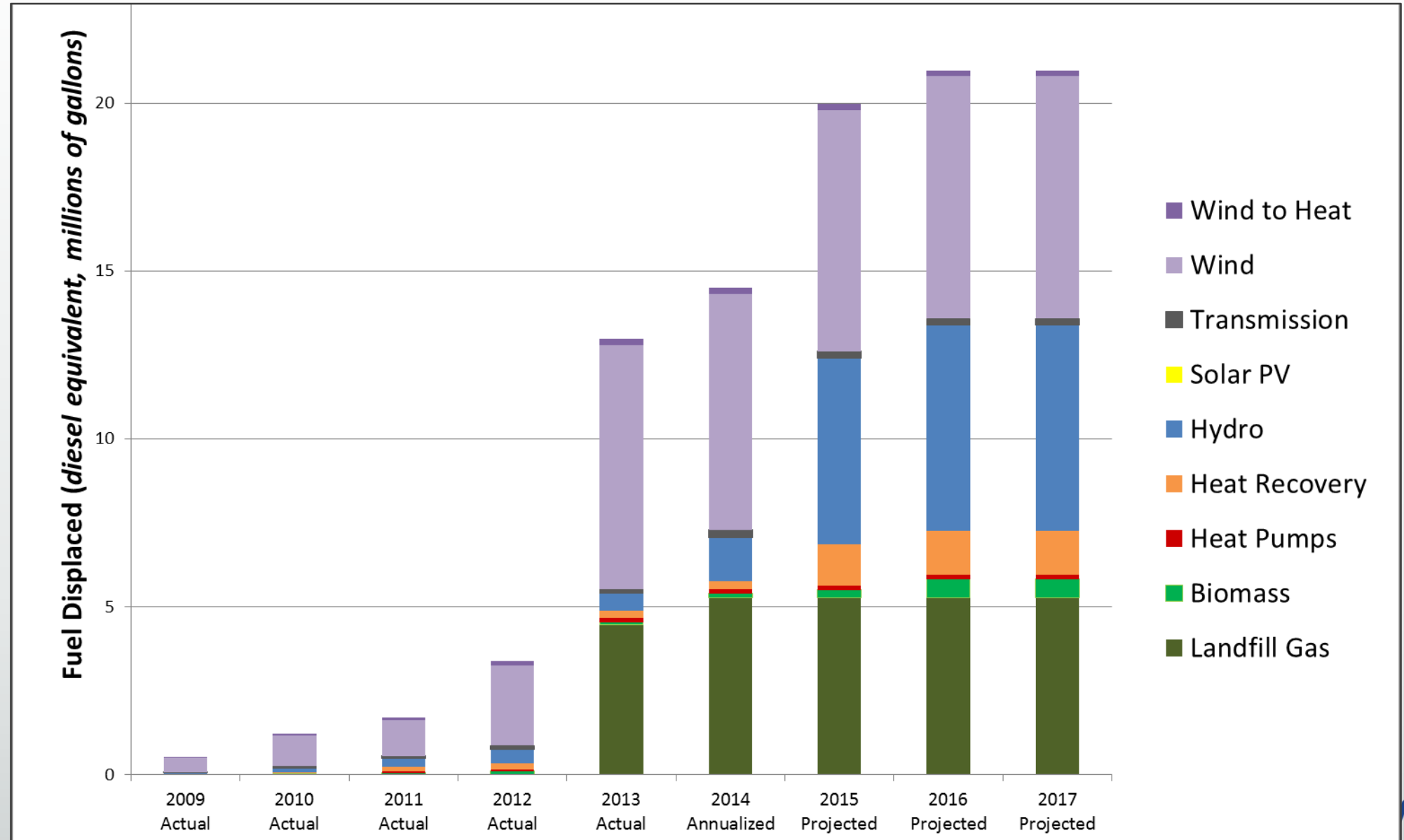


## FUNDED GRANTS BY ENERGY REGION ROUNDS I-VII



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%

# Renewable Energy Fund: Annual Fuel Savings



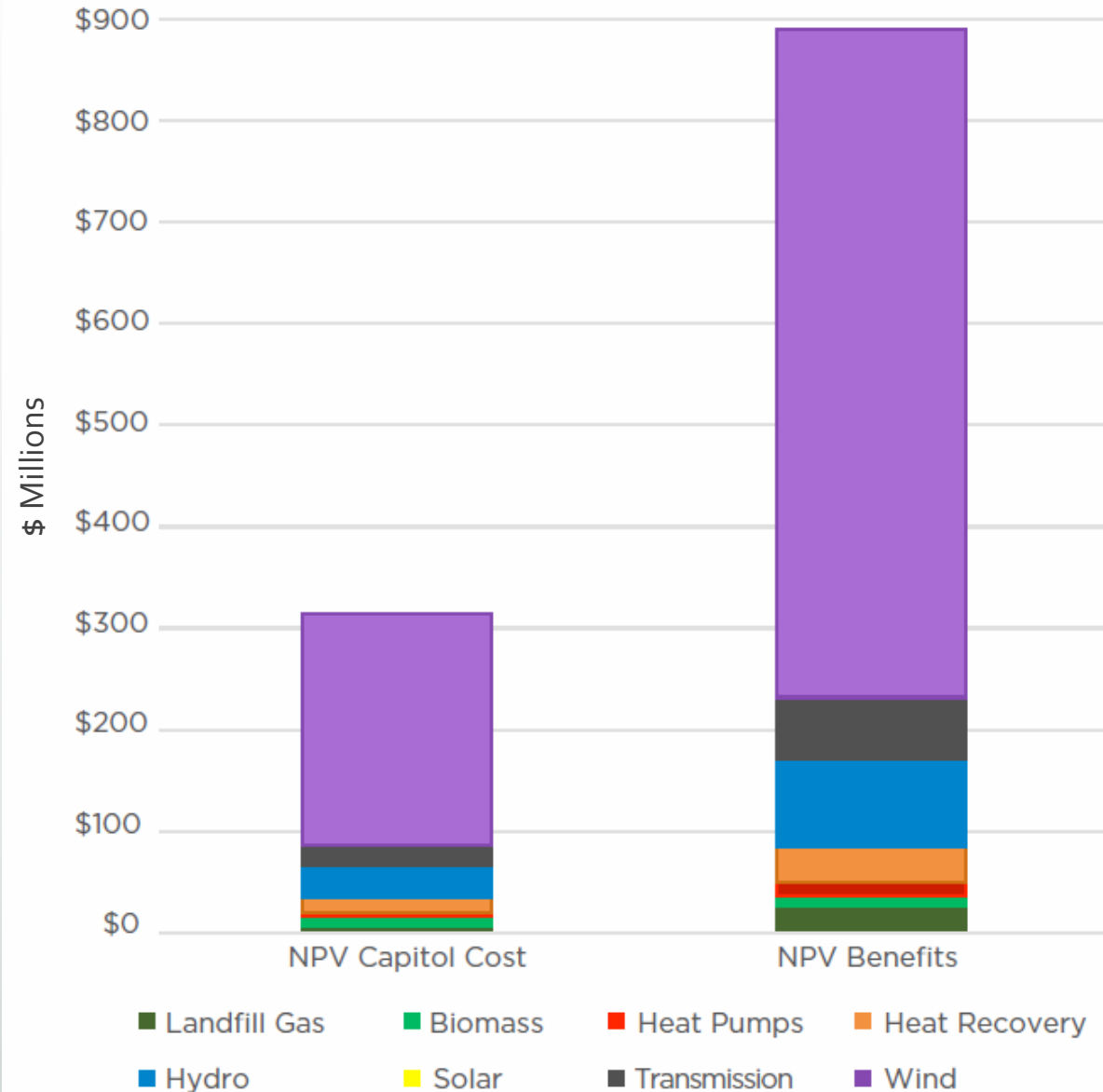


# Renewable Energy Fund: Value Generated

- For first 44 projects in operation
- Total NPV cost of \$314M
- NPV Benefits: \$889M

Overall Program  
Benefit/Cost Ratio: 2.8

## REF CURRENTLY OPERATING PROJECTS



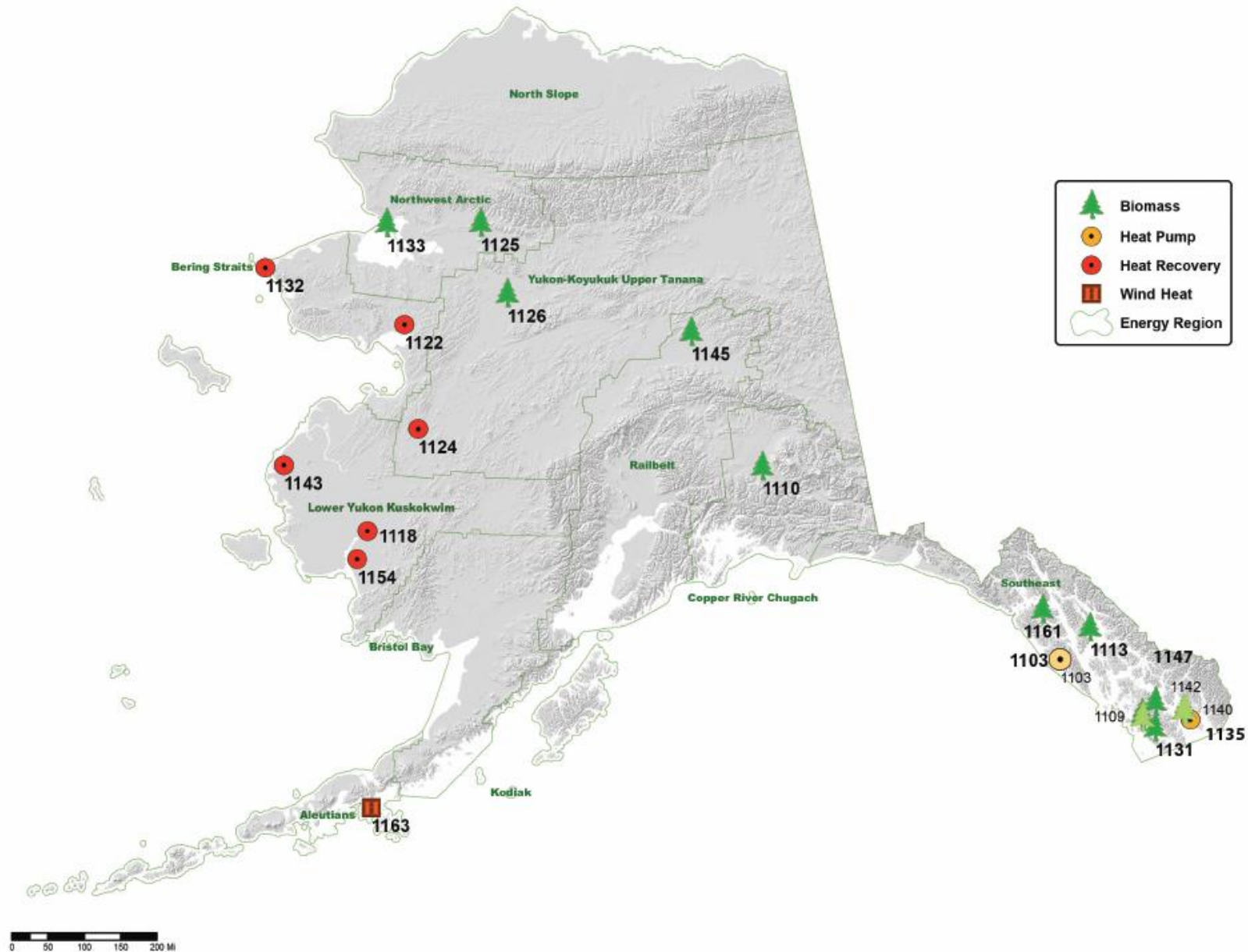


*Allison Creek Hydro Powerhouse Construction  
Copper Valley Electric*

# Round VIII Recommendations

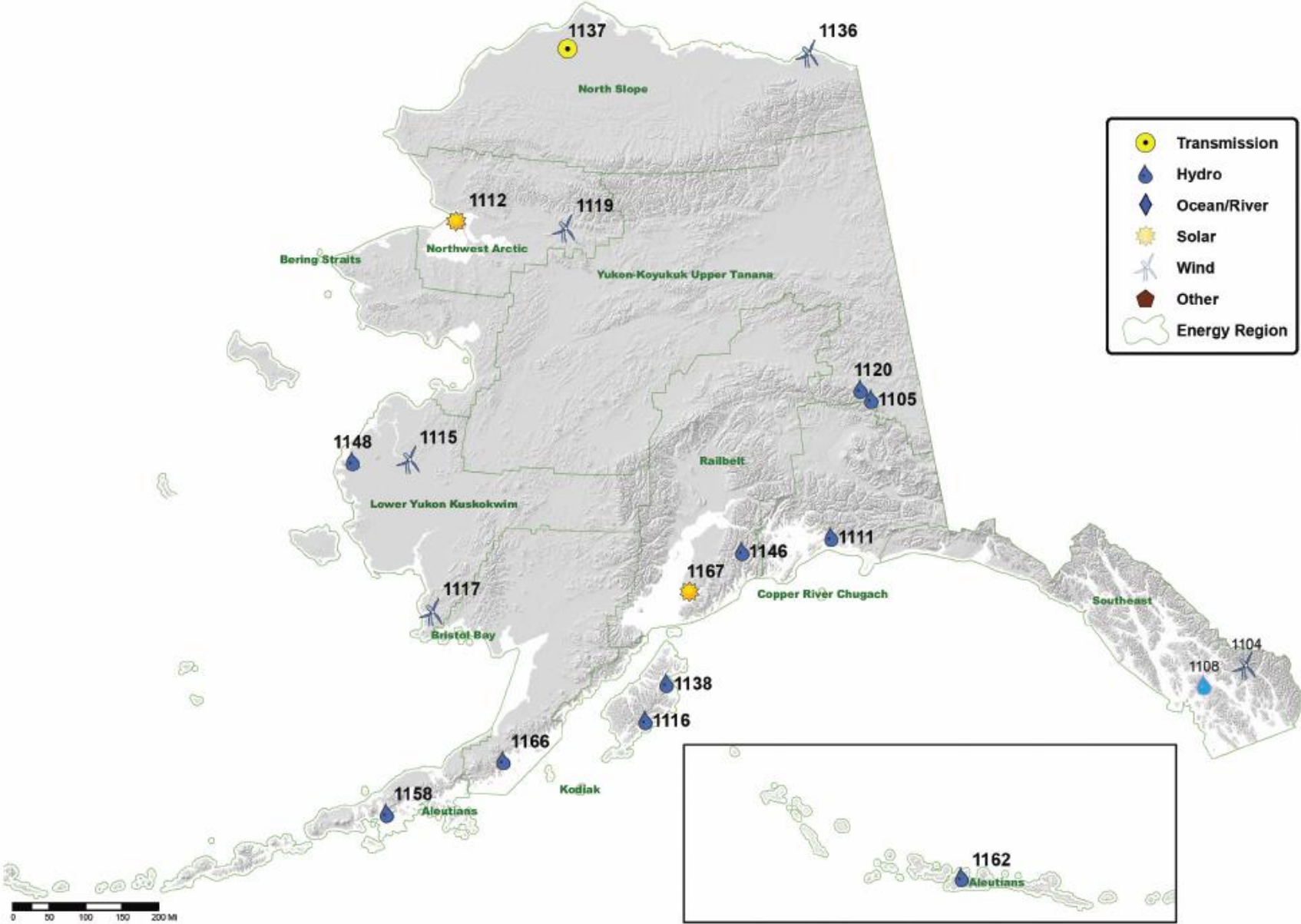
- AEA recommends 40 projects \$28.3M
- To fit within \$15M budget, AEA recommends 34 projects with funding caps
  - 18 Heat projects, \$5.1M
  - 16 Standard projects, \$9.8M
- Regional distribution equity
  - Worked with advisory committee
  - Using energy cost burden (HH energy cost/income) rather than cost of electricity

# RENEWABLE ENERGY FUND ROUND VIII | RECOMMENDED HEAT PROJECTS



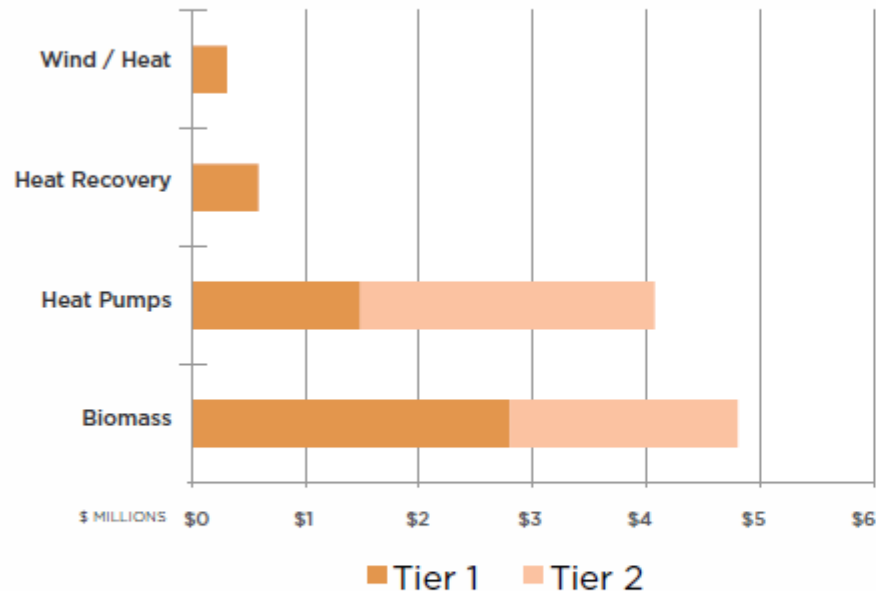


RENEWABLE ENERGY FUND  
ROUND VIII | RECOMMENDED STANDARD PROJECTS

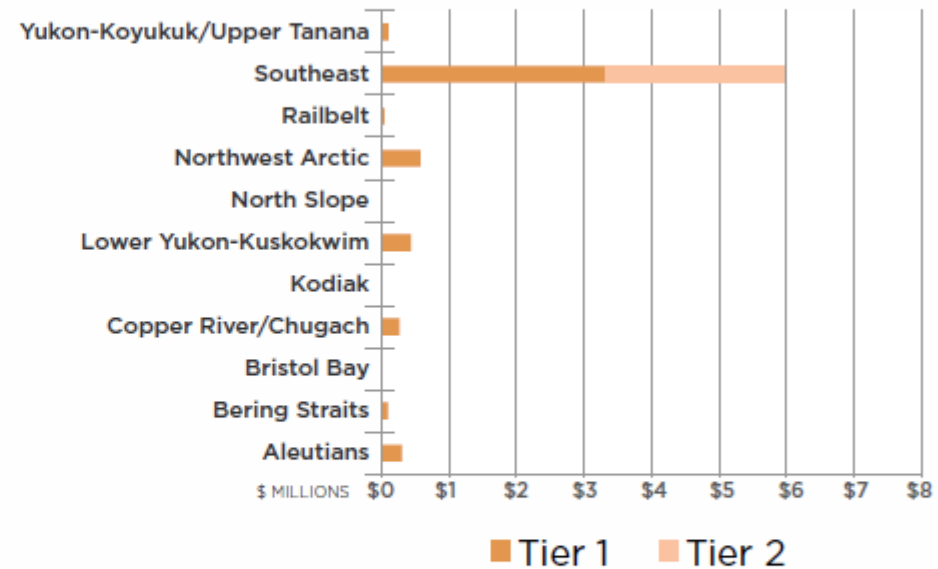


# Recommended Heat Projects

## HEAT PROJECTS BY RESOURCE



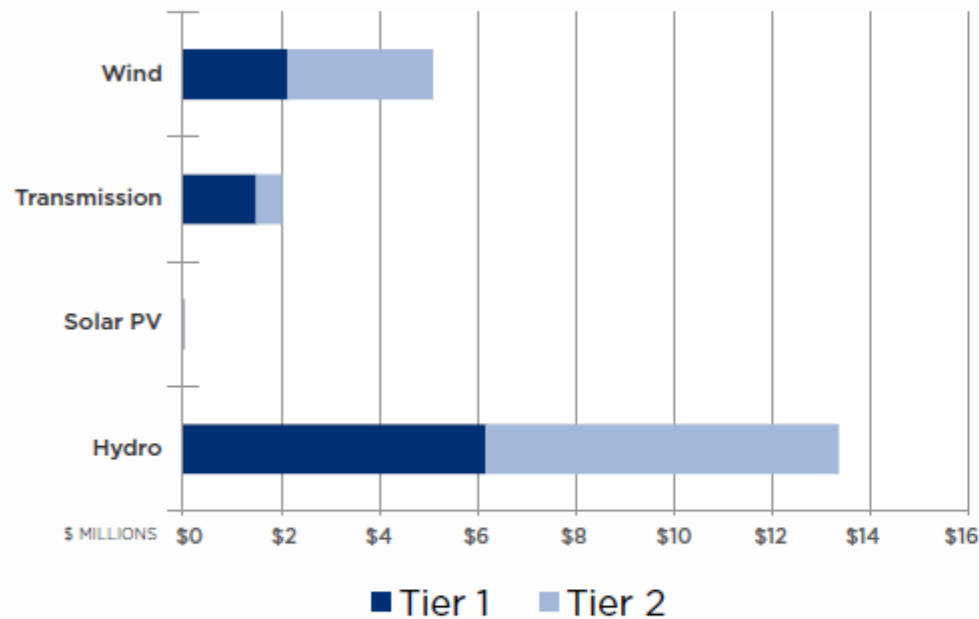
## HEAT PROJECTS BY REGION



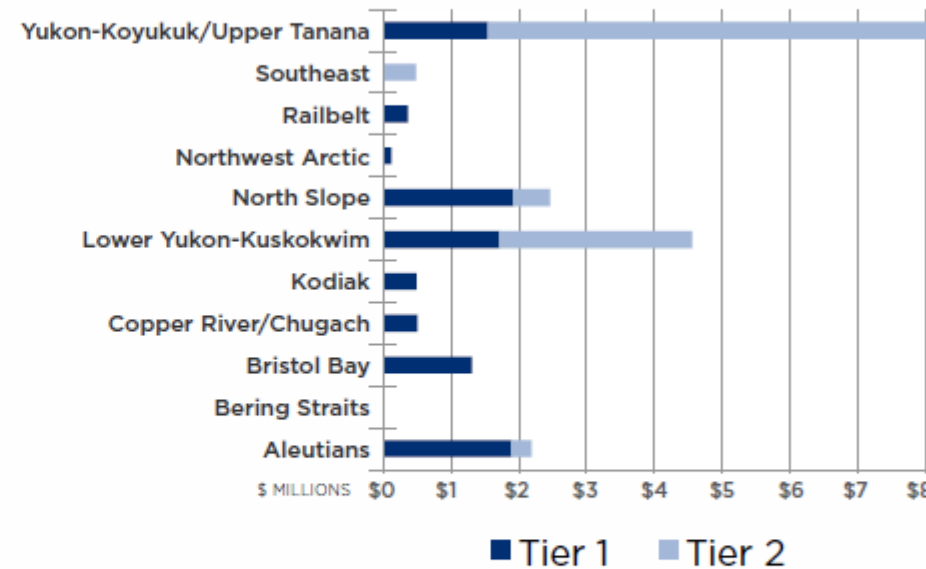
The two bar charts show RVIII recommended funding by energy resource and by region for heat projects. The darker shade (Tier 1) indicates recommended funding within the Governor's \$15 million budget. The lighter shade (Tier 2) indicates recommended funding that falls below the target budget.

# Recommended Electric Projects

## STANDARD PROJECTS BY RESOURCE



## STANDARD PROJECTS BY REGION



The two bar charts show RVIII recommended funding by energy resource and by region for standard projects. The darker shade (Tier 1) indicates recommended funding within the Governor's \$15 million budget. The lighter shade (Tier 2) indicates recommended funding that falls below the target budget.



# Story: Thorne Bay Biomass

- School biomass boiler
  - Feasibility funded through Alaska Wood Energy Development Task Group
  - Design & construction funded by REF
- Displaces 9,000 gal. diesel/year
- Parents and students raise money for activities by splitting and stacking wood
- Heats greenhouse; students grow vegetables; served in school lunch; extra sold locally
- Part of curriculum, economic development, local health, local jobs, local energy



*Thorne Bay Biomass and Greenhouse*  
*Photos courtesy of Dan Bihn*

# Story: Unalakleet Wind



- Six Northern Power Systems 100kW wind turbines
- Commissioned in November 2011, dovetailing with a power plant upgrade
- 2013: contributed ~40% of total electricity produced and saved the community \$276,000 in fuel costs
- 2014: \$213,000 savings in first three quarters alone

[AKEnergyAuthority.org](http://AKEnergyAuthority.org)

