

REGIONAL WIND DEVELOPMENT – AN EXPANDING MARKET

INTERNATIONAL WIND-DIESEL WORKSHOP

APRIL 23-25, 2008

GIRDWOOD, AK

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What I'll talk about

2

- Alaska
- Wind Resource in Alaska
- Regional Wind Development Study

3

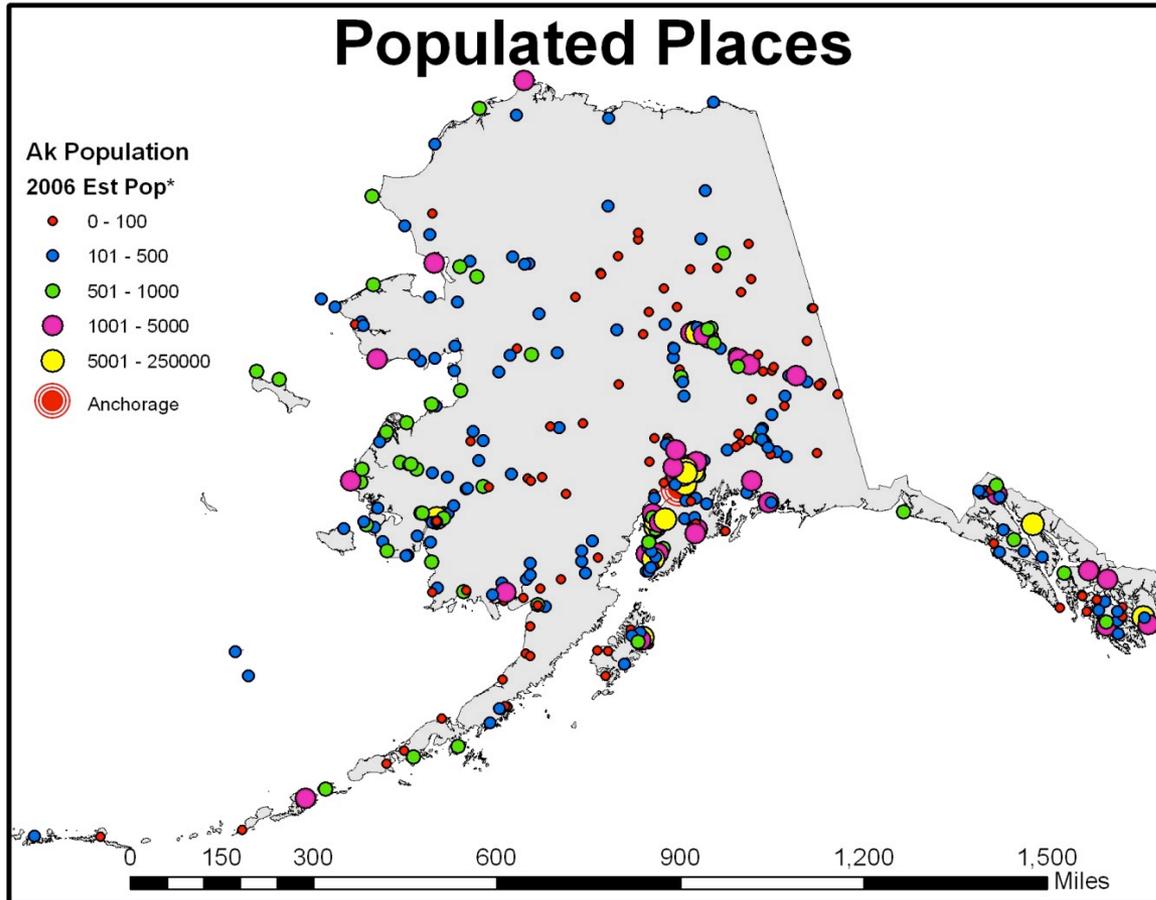
Alaska



Source: www.tongass-seis.net/media/images/AK-USA.jp

Almost 50% of all Alaskan's live in rural areas

Population
2006 Census:
653,313



Anchorage:
282,813

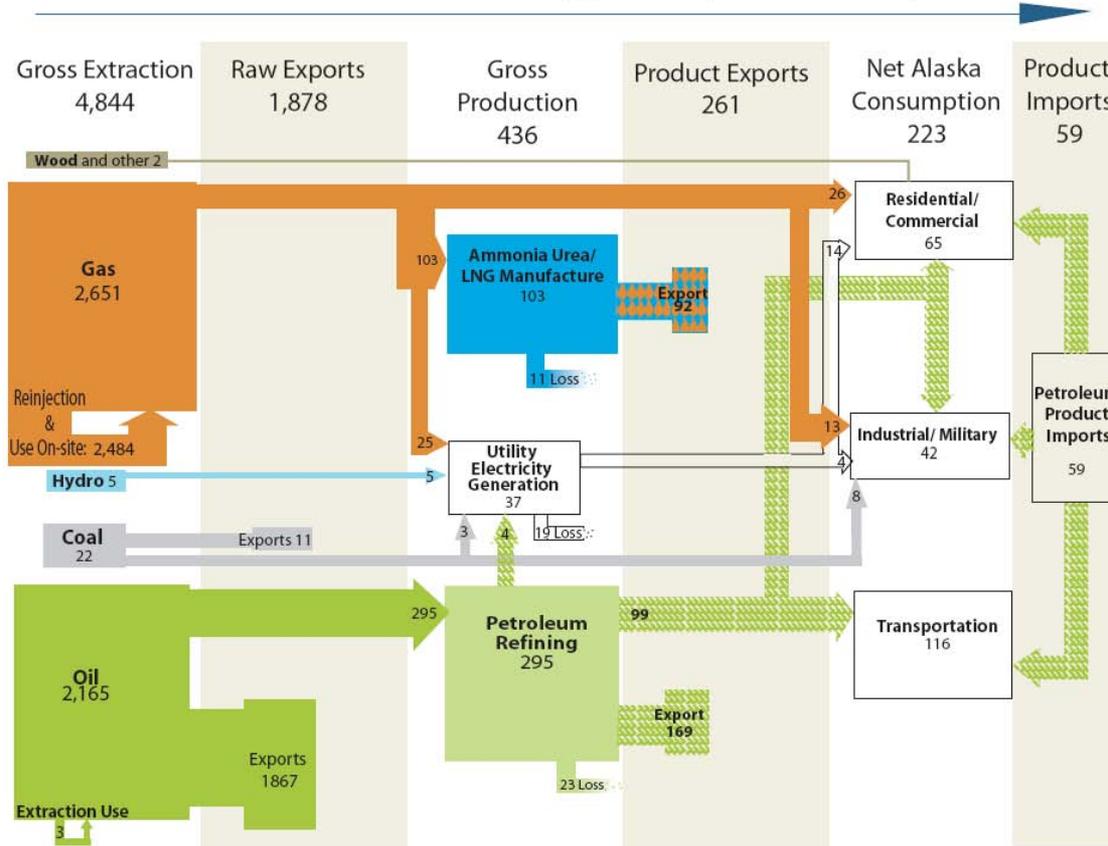
Juneau: 30,650
Fairbanks:
30,552

Rural
Communities:
309,298 in
343 populated
places

Source: DCCED, Map AEA.

Statewide Energy Issues

2001 Alaska Energy Flow (Trillion BTUs)



- In 2001 4.8 trillion BTU of energy were produced in Alaska

- Mostly from Oil and Gas

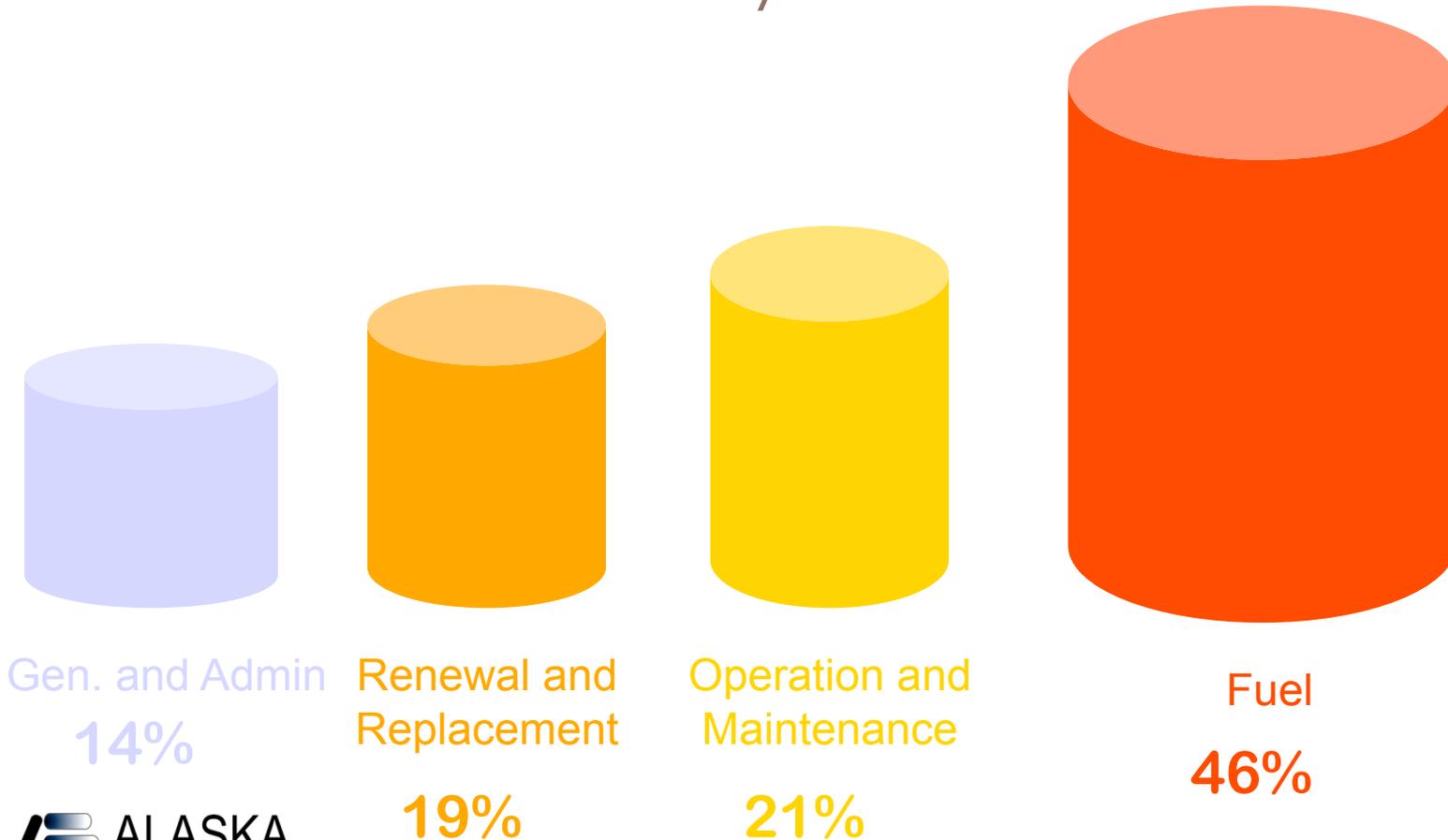
- About 85% of the oil Alaska produces is exported

- Alaska is importing about 30% of its exported refined petroleum back

Source: Colt, S., 2005.

Breakdown of “Typical Village” Power Price

38 ct/kWh

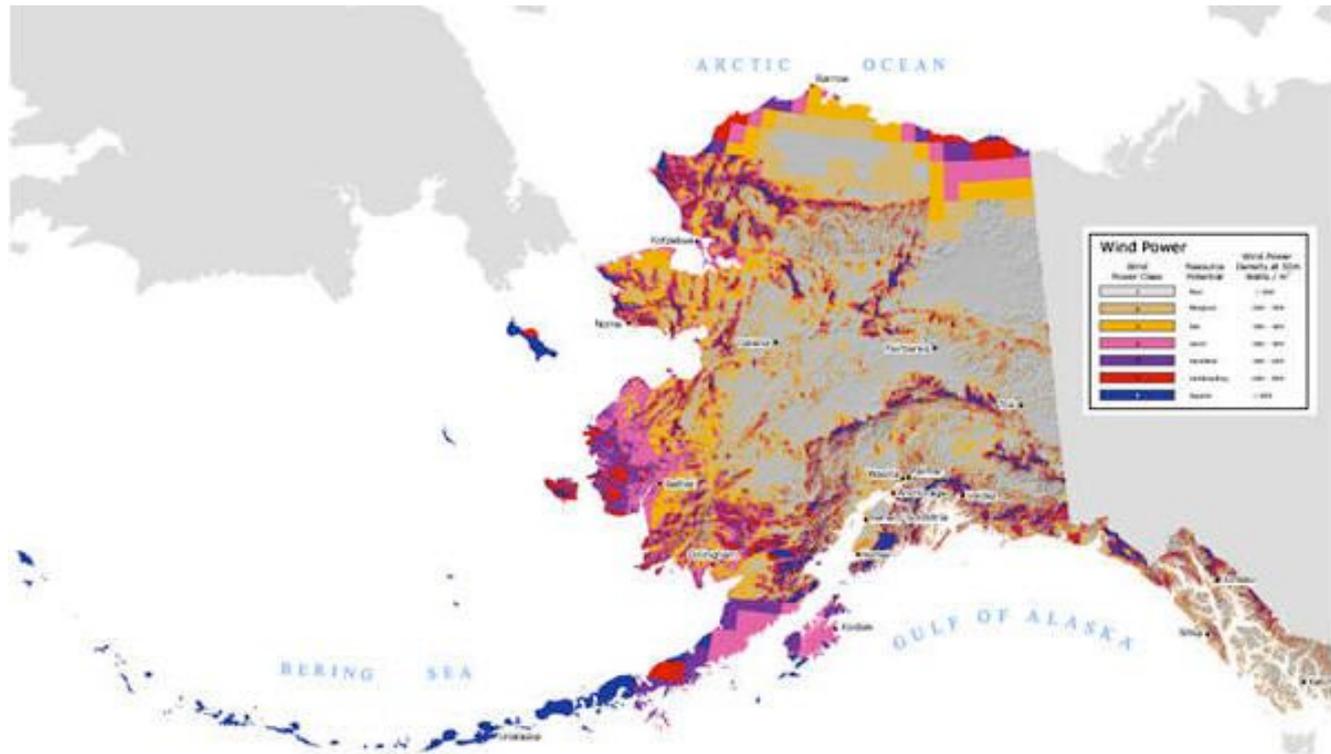


8

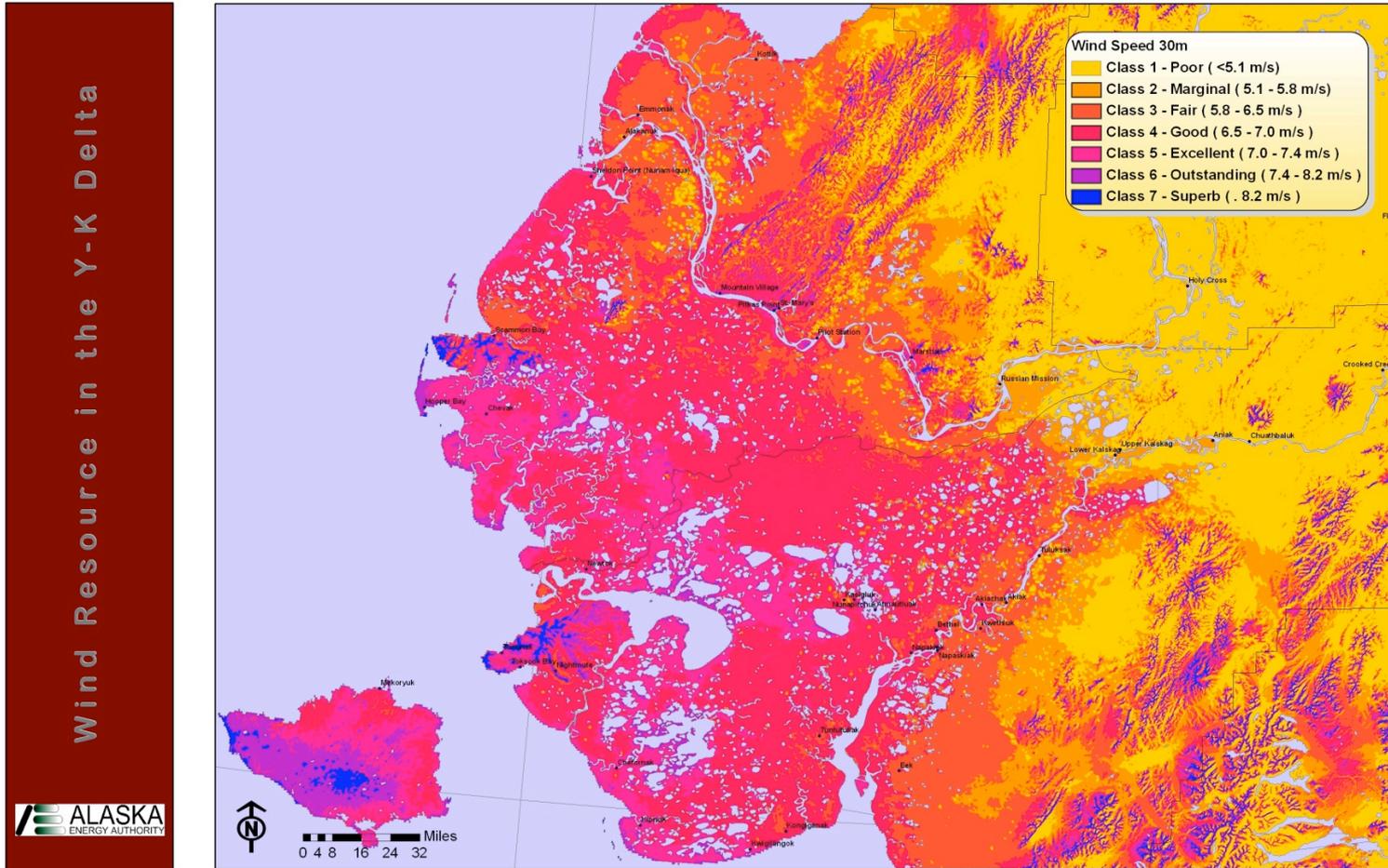
Wind Resource in Alaska

Wind Resource in Alaska

9



Wind Resource in Western Alaska



Methodology

- **Database** - Community name, Census area, Coordinates, Population, Fuel Cost, Wind Class
- **Ranking** - Wind 70%, Population 25%, Fuel Cost 5%

- **Filter** –

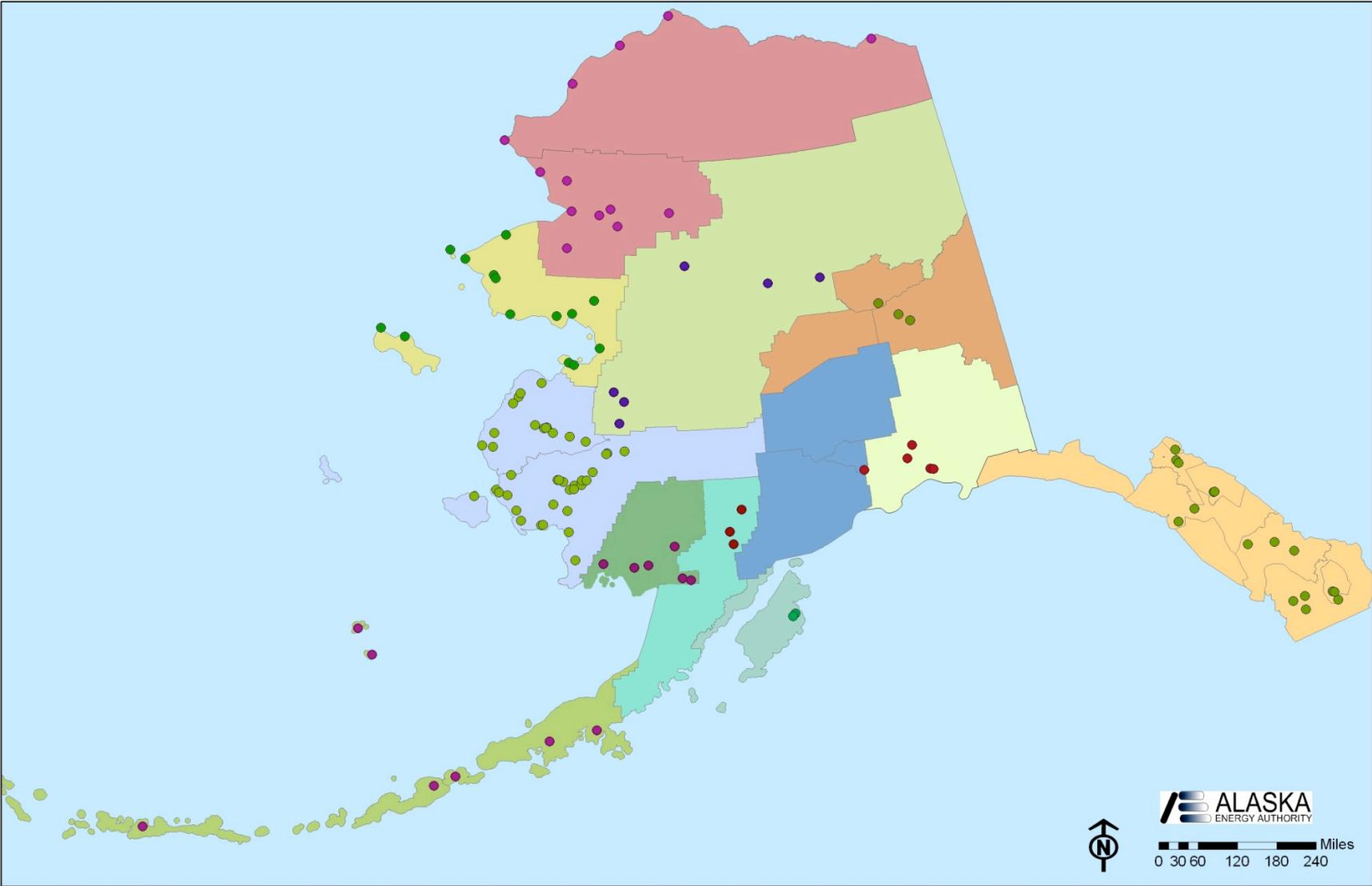
Percentile	Suitability
100-75	Outstanding
74-50	Excellent
49-25	Good
24-0	Fair

- Filter I - The ranking results were equally divided into four categories, each represent 1/4 of the total amount of ranked villages.
- Filter II - Population numbers were divided into eight groups of community size.
- Filter III - In the last phase a combination of low load and low ranking was applied

Dismiss		Allow	
Rank - Population	25-99 limited	>5,000 metropolitan	Rank - Population
Rank - Population	0-24 camp	2000 - 4,999 large	Rank - Population
Rank - Population	49-25 Good	1000 - 1,999 extensive	Rank - Population
Rank - Population	24-0 Fair	500 - 999 medium	Rank - Population
Allow combination of:			
Rank - Population	Good metropolitan	100-75 Outstanding	Rank - Population
Rank - Population		74-50 Excellent	Rank - Population

Population	Category
>5,000	metropolitan
2000 - 4,999	large
1000 - 1,999	extensive
500 - 999	medium
250 - 499	intermediate
100 - 249	small
25- 99	limited
0-24	camp

Wind Development Regions - Filtered Results



Economic Impact Modeling

14

Input

- Communities [1 1 2 Filtered Results]
- Total Diesel Generation [kWh]
- Total Diesel Used [gal]
- Diesel Price [\$FY07]

Output

- Annual Wind Production [kWh]
- Wind Capital Cost [\$FY07]
- Diesel Displacement [gal]
- Diesel Savings [\$FY07]
- GHG Emissions Reduction [tonnesCO2]

Results Regional Sample

15



Community	Census Area	Wind Class	Total diesel generated FY07 [kWh]	Total Diesel used [gal]	Diesel Price [\$FY07]	Annual Wind Production [kWh]	Wind Capital Cost	Diesel displacement [gal]	Diesel savings [\$FY07]	GHG reduction [tco2]
King Salmon	Bristol Bay	4	0	0		\$	200,000	0 \$	-	
Naknek	Bristol Bay	4	22,203,563	1,537,298 \$	2.39	11,895,000 \$	12,200,000	915,000 \$	2,186,850	9,583
Alegnagik	Dillingham		367,920	28,302 \$	3.94	457,000 \$	600,000	35,154 \$	138,506	368
Dillingham	Dillingham	5	19,081,200	1,221,084 \$	2.40	25,431,000 \$	24,200,000	1,956,231 \$	4,694,954	20,487
Manokotak	Dillingham		1,067,400	66,295 \$	4.71	686,000 \$	800,000	52,769 \$	-	552
New Stuyahok	Dillingham	6	1,206,029	87,967 \$	3.03	649,000 \$	1,000,000	49,923 \$	151,267	546
Togiak	Dillingham		2,559,306	178,398 \$	2.85	1,795,000 \$	1,800,000	138,077 \$	393,519	1,510
Kokhanok	Lake & Peninsula		505,141	41,129 \$	4.22	457,000 \$	600,000	35,154 \$	148,349	368
Newhalen	Lake & Peninsula		528,966	42,686 \$	2.35	2,693,000 \$	2,600,000	207,154 \$	486,812	2,265
Port Alsworth	Lake & Peninsula		623,38	56,082 \$	4.05	686,000 \$	800,000	52,769 \$	213,715	552
Kodiak	Kodiak Island	4	21,067,800	1,620,600 \$	3.94	11,782,000 \$	12,200,000	906,308 \$	3,570,852	9,492

Total Potential Impact

16

- Annual Wind Production ~375,000 MWh
- Capital Cost ~\$380,300,000
- Greenhouse Gas Reduction 545,000 t_{CO2}
- Diesel displacement ~28,833,814 gal
- Installed capacity ~90 MW



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17

Thank You !