

ALASKA ENERGY

A first step toward energy independence.



Alaska Energy Authority

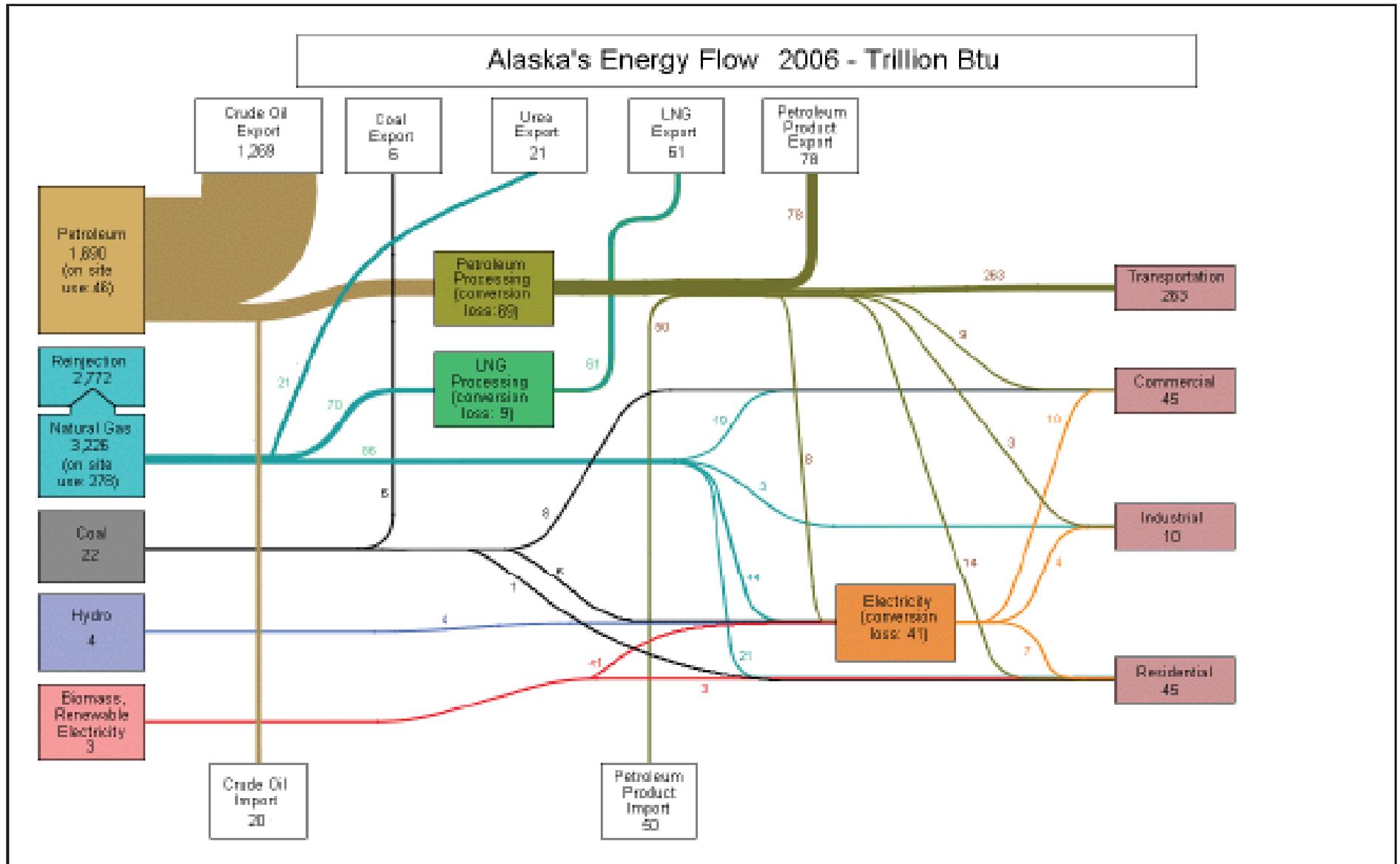
March 2009

Alaska Center for Energy and Power

The First Step

- **Narrative and model designed to:**
 - Provide clarity for local fuel use
 - Engage passionate Alaskans
 - Provide energy solutions
 - Stimulate the Alaskan economy

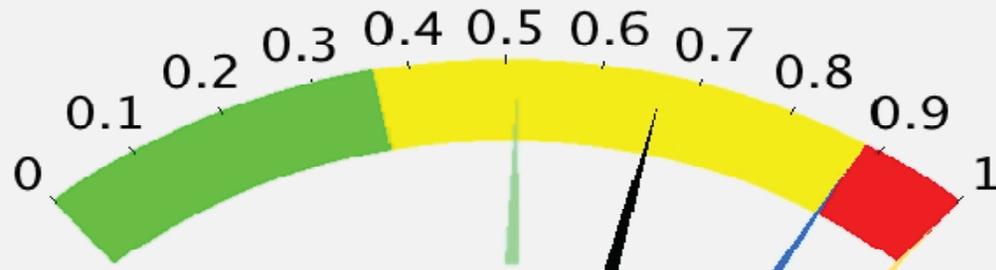
Alaska Energy Flow – Pg. 24



Methodology

- **Local Fuel Use**
- **Community meetings**
- **Local Resource matrix**
- **Technology teams**
- **High level cost of alternatives**

Energy Meters

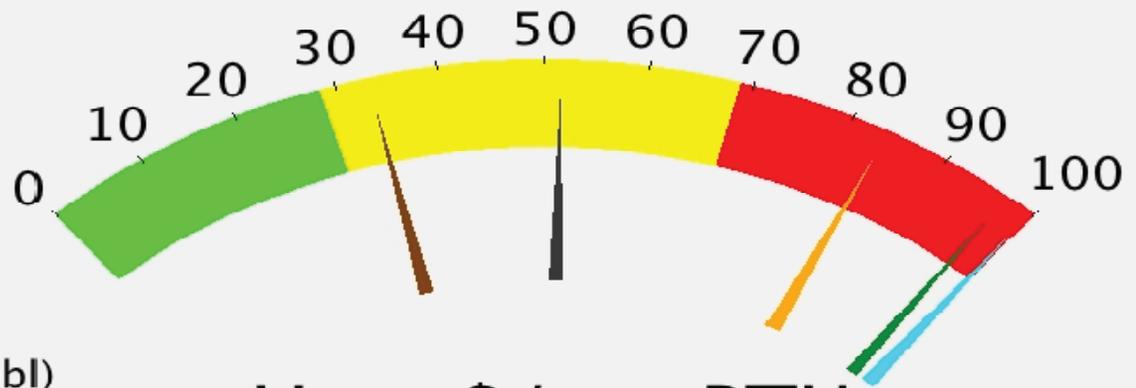


Electricity \$/kWh
(Including fixed cost of electricity)

- \$7.35 ■ Geothermal
- \$0.88 ■ Wind/Diesel
- \$0.51 ■ Hydro
- \$0.66 ■ Diesel (\$110/bbl)

Green: Less than \$50/bbl crude.
 Yellow: \$50/bbl to \$150/bbl crude.
 Red: Greater than \$150/bbl crude.

- \$83.79 ■ Geothermal
- \$97.04 ■ Hydro
- \$144.8 ■ Wind
- \$33.27 ■ Wood
- \$51.69 ■ Fuel Oil (\$110/bbl)



Heat \$/mmBTU

(Akutan)

Sample Community – Pg. 15

Current Energy Status

PCE

Electric (Estimates based on PCE)

Estimated Local Fuel cost @ \$110/bbl \$4.71

Current efficiency	11.81 kW-hr/gal	Fuel COE	\$0.45 /kw-hr	/kw-hr	Estimated Diesel OM	\$10,206
Consumption in 2007	48,913 gal	Est OM	\$0.02 /kw-hr		Other Non-Fuel Costs:	\$98,502
Average Load	58 kW	NF COE:	\$0.19 /kw-hr		Current Fuel Costs	\$230,488
Estimated peak load	116.51 kW	Total	\$0.66		Total Electric	
Average Sales	510,306 kW-hours					\$339,196

Space Heating (Estimated)

2000 Census Data	2008 Estimated Heating Fuel used:	56,012 gal	
Fuel Oil: 100%	Estimated heating fuel cost/gallon	\$5.71	
Wood: 0%	\$/MMBtu delivered to user	\$51.81	Total Heating Oil
Electricity: 0.0%	Community heat needs in MMBtu	6,721	\$319,950

Transportation (Estimated)

Estimated Diesel: 22,154 gal	Estimated cost	\$5.71	Total Transportation
			\$126,547

Energy Total \$785,693

Alternative Resource – Pg. 16-17

Alternative Energy Resources

Geothermal

Installed KW	5000	Capital cost	\$38,500,000	per kW-hr	Heat Cost \$/MMBtu:
kW-hr/year	41610000	Annual Capital	\$2,587,805	\$0.06	\$13.22
Site Name	Akutan - Shallow	Annual OM	\$1,155,000	\$0.03	\$3.13
Project Capacity	200 MW	Fuel cost:	\$0	\$0.00	
Shallow Resource	0 Feet	Total Annual Cost	\$3,742,805	\$0.09	\$26.36
Shallow Temp	99.00 C	Non-Fuel Costs		\$0.21	
		Alternative COE:		\$0.30	
		% Community energy		8154%	Savings
		New Community COE		\$7.55	(\$3,403,609)
		<i>(Includes non-fuel and diesel costs)</i>			

Hydro

Installed KW	197	Capital cost	\$2,507,920	per kW-hr	Heat Cost \$/MMBtu:
kW-hr/year	566166	Annual Capital	\$97,472	\$0.17	\$50.44
Site	North Creek	Annual OM	\$55,200	\$0.10	\$28.57
Study plan effort	feasibility	Fuel cost:	\$0	\$0.00	
Plant Factor	69 %	Total Annual Cost	\$152,672	\$0.27	\$79.01
Penetration	0.52	Non-Fuel Costs		\$0.21	
		Alternative COE:		\$0.48	
		% Community energy		111%	Savings
		New Community COE		\$0.51	\$186,524
		<i>(Includes non-fuel and diesel costs)</i>			

Railbelt Energy Pg. 18-21

- **Integrated Resource Plan**
 - Susitna hydro
 - Chakachamna hydro
 - Fire Island wind
 - New Cook Inlet gas
 - Bullet Line
 - Trucking LNG
 - Nenana gas

Local Sizing to Regional Roll-up

Cost @ capacity	Debt+O&M+Fixed \$	Debt	O&M+Fixed \$	Yearly kWh	Capacity (kW)
Usage	\$0.66	\$0.00	\$0.66	510,306	117
Efficiency					
Heat Recovery					
Akutan- Deep	\$0.29	\$0.05	\$0.24	49,932,000	6,000
Akutan- Shallow	\$0.30	\$0.06	\$0.24	41,610,000	5,000
Loud Creek	\$0.43	\$0.14	\$0.29	701,186	209
North Creek	\$0.48	\$0.17	\$0.31	566,166	197
Wind-Diesel	\$0.49	\$0.23	\$0.26	1,218,860	600

Local Sizing to Regional Roll-up

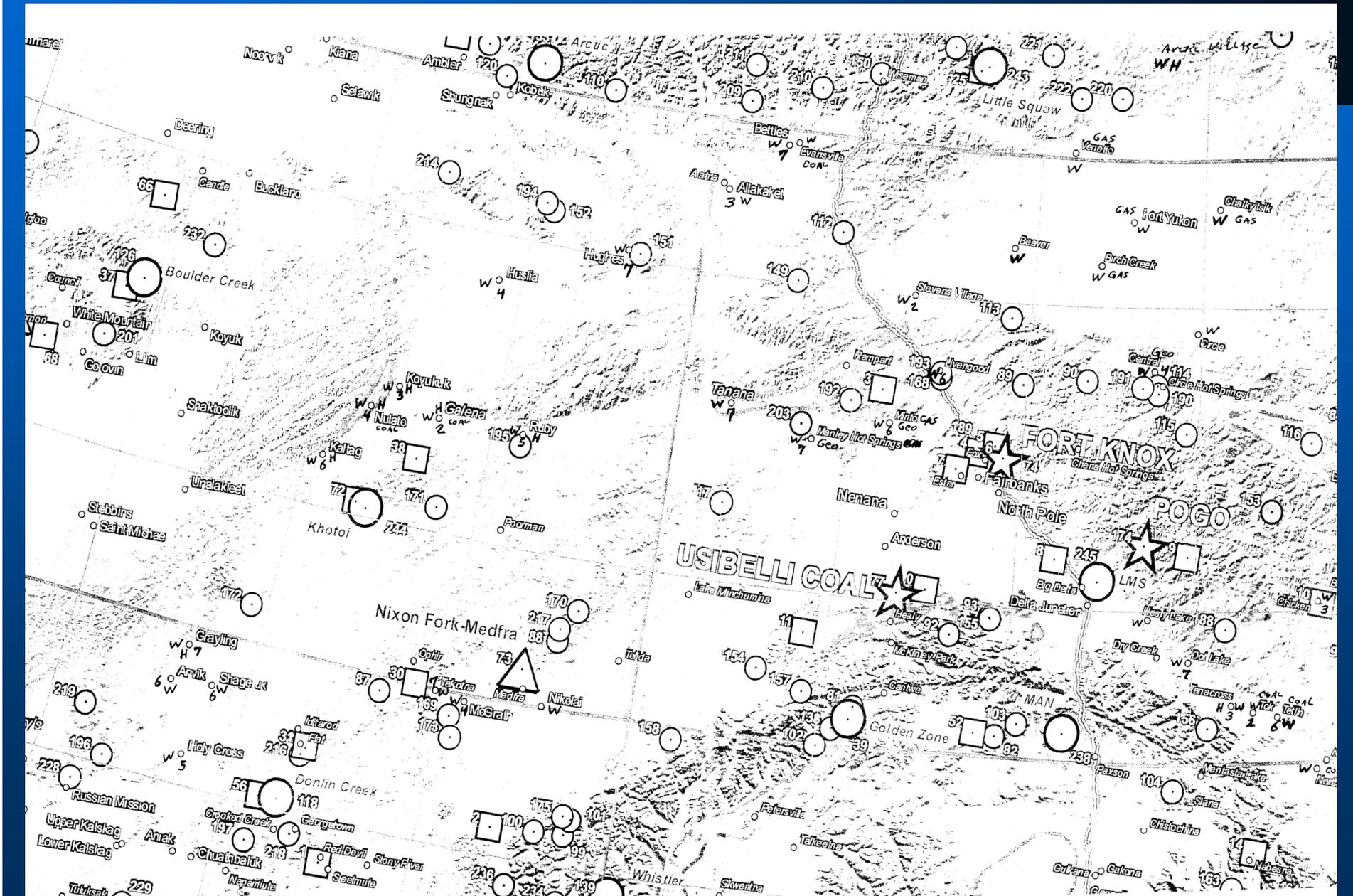
94,028 Gen
510 Load

Build transmission lines to areas that need additional resources.

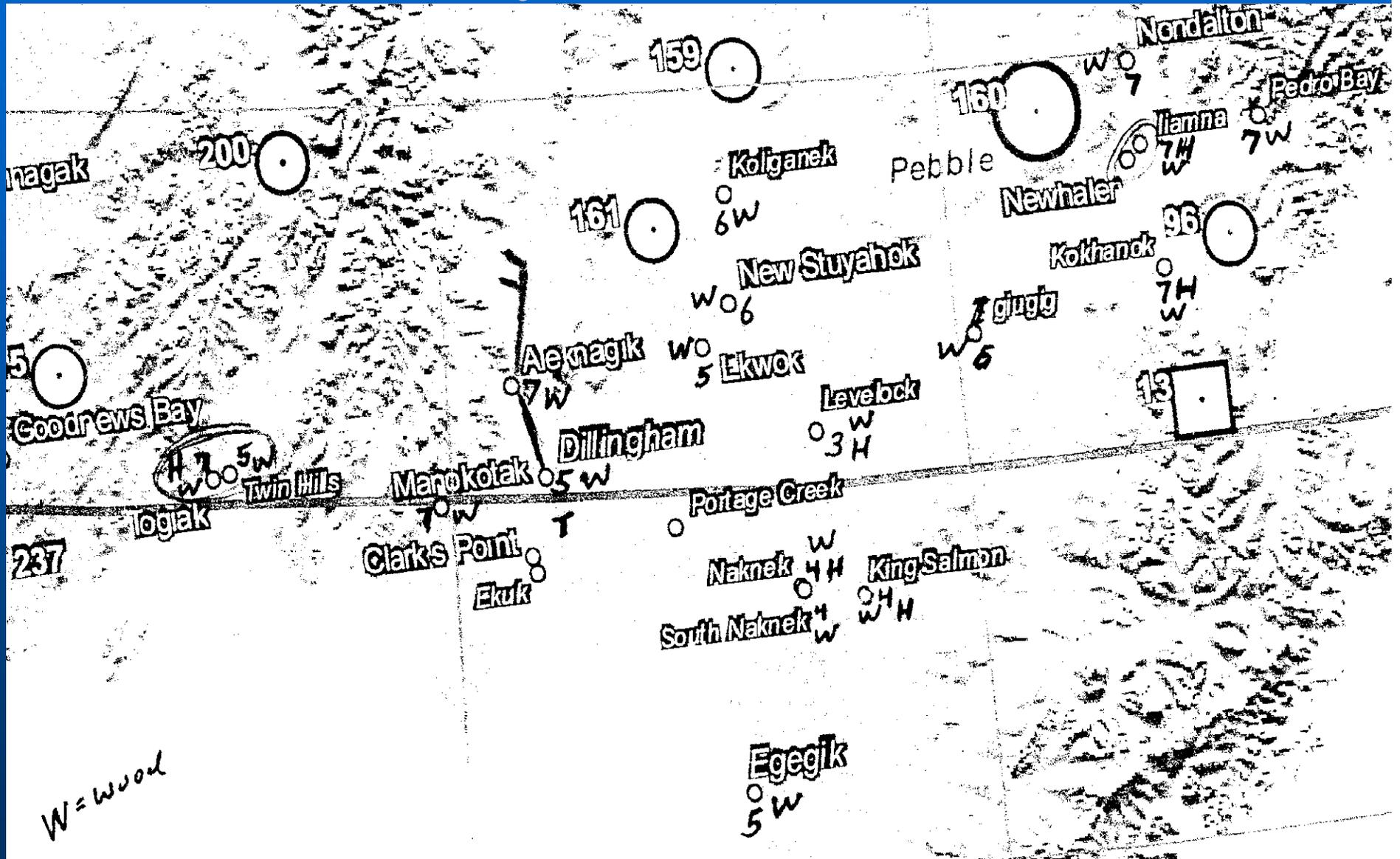
200 Gen
600 Load

150 Gen
400 Load

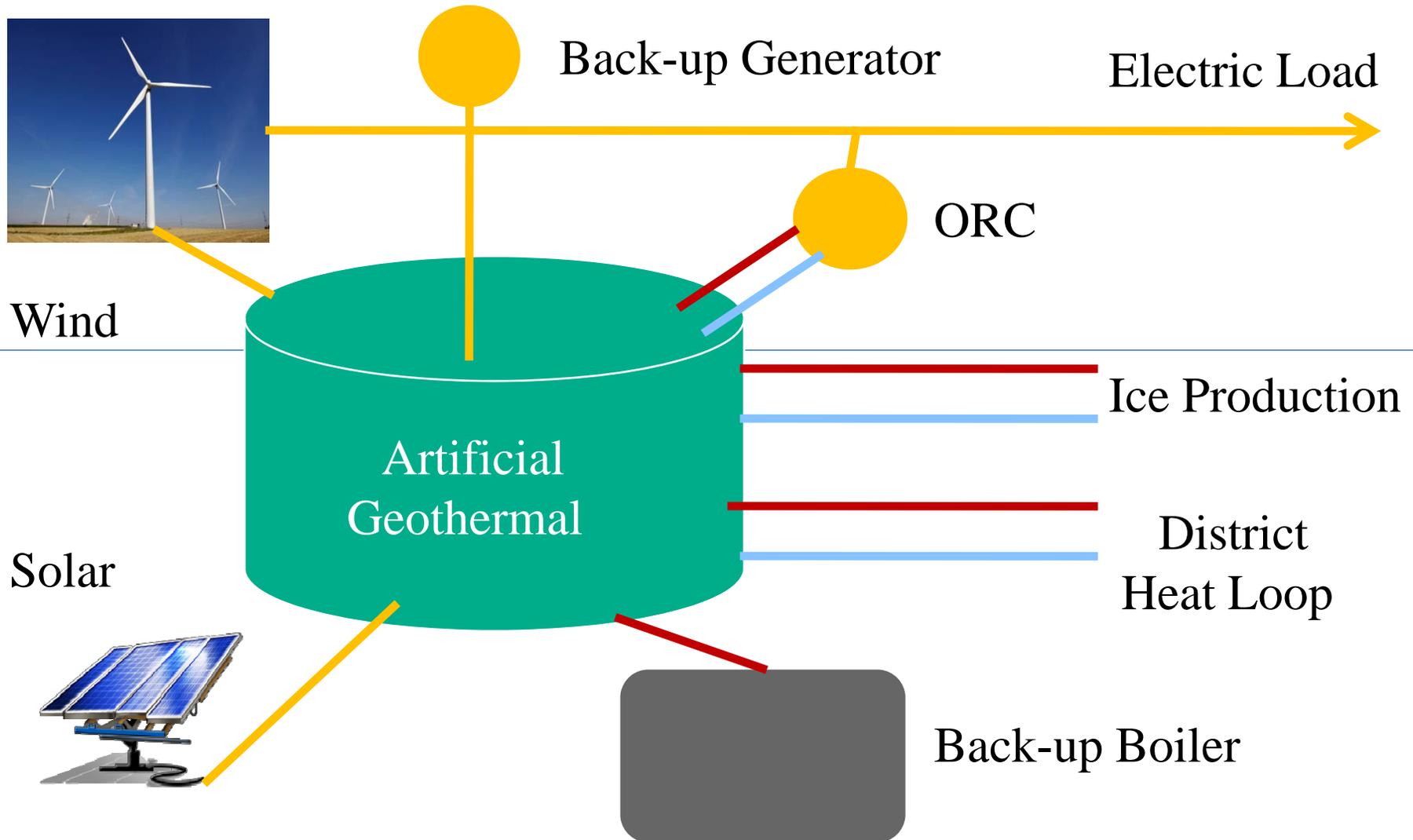
Community Resources- Doyon



Community Resources - BBNC



Integrated Solutions



Schedule of Next Steps

- **January- Rollout of Alaska Energy: The first step to energy independence**
- **March- Coordinating with utilities, municipalities, and native corporations.**
- **April - May - Meet in each of 12 regions to explain observations, assumptions, regional roll-ups and receive input.**

Questions ???

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