NANA Regional Corporation Overview
November 7, 2007
This is NANA | NANA Regional

- Regional Native corporation for the NW Arctic region- based in Kotzebue
- 7,200 people living in 11 communities or villages; total 11,000 shareholders
- NW Arctic Borough: governing body for the region.
- Encompasses 38,000 square miles, about the size of Indiana.
- “Tribal Members” (Inupiat Eskimos) who live the subsistence lifestyle
Organizational Mission
NANA improves the quality of life for our people by maximizing economic growth, protecting and enhancing our lands, and promoting healthy communities with decisions, actions, and behaviors inspired by our values and Core Principles.

Inupiaq Values
- Knowledge of Language
- Sharing
- Respect for Others
- Cooperation
- Respect for Elders
- Avoid Conflict
- Humor
- Domestic Skills
- Responsibility to Tribe
- Knowledge of Family Tree
- Humility
- Love for Children
- Hard Work
- Respect for Nature
- Family Roles
- Spirituality
- Hunter Success
“The economic future of the NANA region is directly tied to restructuring current energy options and looking towards alternative & renewable sources.”

*Jeff Nelson, Assistant Director of Lands*
NANA support a variety of programs to benefit shareholders, including:

- Energy
- Cultural programs
- Regional Elders programs
- Camp Sivunnigvik
- Shareholder employee development
- Scholarships and internships
- Business and Career fairs
- Village partnerships
- Resource specialists
- Disaster, medical and burial assistance
- Non-profits benefiting shareholders
**Alaska Native Claims Settlement Act**

- Congress enacted ANCSA in 1971
- NANA is one of 12 Alaska Native-owned regional corporations
- Land transferred from federal to private ownership and to manage investment
- Alaska Native People would guide development and investment
Aerial view of new power plant, tank farm, cogeneration, and wind turbines at Selawik, Alaska.
Extraordinary Challenge of Providing Energy in NW Alaska

- Topography
- Geography
- Climate
- Costs
- Transportation
- Storage
- NANA
  - Energy Security
    - Global Energy Prices
    - Economies of Scale
    - Interconnectedness
    - Isolation

NANA

- NANA
NANA Region Energy Challenges

- 200 miles from the nearest road
- Barge & Air Delivery of all consumables
- Forefront of Global Warming: erosion, permafrost, & transportation corridors
- Small Communities
# 2005 Power Cost (actual)

<table>
<thead>
<tr>
<th>Category</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fuel</td>
<td>15.7</td>
</tr>
<tr>
<td>Non Fuel Power Generation</td>
<td>10.7</td>
</tr>
<tr>
<td>Depreciation</td>
<td>7.3</td>
</tr>
<tr>
<td>Administration &amp; General</td>
<td>3.2</td>
</tr>
<tr>
<td>Consumer Accounts</td>
<td>2.0</td>
</tr>
<tr>
<td>Distribution O &amp; M</td>
<td>1.9</td>
</tr>
<tr>
<td>Interest on LTD</td>
<td>1.7</td>
</tr>
<tr>
<td>All Taxes</td>
<td>.5</td>
</tr>
<tr>
<td><strong>TOTAL (2005)</strong></td>
<td><strong>43.0</strong></td>
</tr>
<tr>
<td><strong>TOTAL (2006)</strong></td>
<td><strong>45.0</strong></td>
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</tbody>
</table>

An increase of 7.0 cents/kwh since 2003
# Costs to Consumer

<table>
<thead>
<tr>
<th>Cost of 700 Res kwh</th>
<th>2005 PCE Power Cost cost per kw/hr</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anchorage</td>
<td>Chugach Electric (Anch)</td>
</tr>
<tr>
<td></td>
<td>$83.64</td>
</tr>
<tr>
<td>Fairbanks</td>
<td>Golden Valley (Fbx)</td>
</tr>
<tr>
<td></td>
<td>$64.40</td>
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<tr>
<td>Juneau</td>
<td>AEL&amp;P (Juneau)</td>
</tr>
<tr>
<td></td>
<td>$71.18</td>
</tr>
<tr>
<td>Kodiak</td>
<td>Kodiak Electric</td>
</tr>
<tr>
<td></td>
<td>$117.14</td>
</tr>
<tr>
<td>Kotzebue</td>
<td>AVEC</td>
</tr>
<tr>
<td></td>
<td>$149.03*</td>
</tr>
<tr>
<td>AVEC Villages</td>
<td>Napakiak</td>
</tr>
<tr>
<td></td>
<td>$235.31*</td>
</tr>
<tr>
<td>Napakiak</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$290.53*</td>
</tr>
</tbody>
</table>

* After PCE
Energy costs for the region are extremely high

- Bulk fuel delivered via airplane due to changing river patterns
- Gas and fuel oil must be flown in and retail prices can exceed $7.00 a gallon.
Permafrost and Weather

- Icing on equipment and extreme weather conditions
- Equipment cannot settle, tilt or be uplifted
- Foundation concerns
Climatic and Permafrost
Poor roads, water and sewer lines, boardwalks and existing overhead power and phone lines present obstacles and challenges.
Specialty equipment creates mobilization changes
Vision: To promote energy security in the NANA Region

Three Distinct Projects

- Strategic Energy Plan NANA SEP
- NANA Geothermal Assessment Program NANA GAP
- NANA Wind Resource Assessment Program NANA WRAP

- DOE/NREL Funded
- NANA Pacific Technical Services Contractor

Execution Partners
- Kotzebue Electric Association
- Alaska Village Electric Cooperative
- NW Arctic Borough
- Manilaaq
- Alaska Energy Authority

Selawik, AK
Wind Farm, New Bulk Fuel, Recovered Heat
Partners & Collaborators

In-Kind
• Anemometers - AEA
• Technical Expertise
• Communication & Outreach

Communities
- Corporations
- City Councils
- Village Councils
- Schools
- Institutions

Federal
- Denali Commission
- NREL
- DOE
- USDA

State
- AEA
- AHFC

Regional
- NW Arctic Borough
- NANA
- Manilaaq
- Red Dog & Nova Gold
- KEA, AVEC

NANA
NANA Energy Security:
Strategic Energy Plan

• **SO 1:** Increased collaboration between NANA Region stakeholders on energy policy, program, infrastructure, and increased capacity of tribal entities for the region.

• **SO 2:** Increased understanding of energy options available to NANA Region energy stakeholders for improved energy decision making.

• **SO 3:** Increased awareness and understanding of NANA Region energy needs on the part of external stakeholders.

Northern Lights, Noorvik AK
Energy Security:
NANA
Energy Options

Improved Efficiencies
Cogeneration
Recovered Heat
Economies of Scale
Bulk Fuel Joint Purchasing
Transportation Co-mobilization

Integrated Planning

Hydro
Noatak
Shungnak/Ambler/Kobuk

Geothermal
Kotzebue
Deering/Buckland
Shungnak/Ambler/Kobuk

Wind
Kivalina/Noatak
Kiana/Deering
Buckland
Upper Kobuk

Biomass
Shungnak/Ambler/Kobuk

Diesel Hybrid & Fossil Fuels
NANA
NANA SEP Activities

- Region Energy Steering Committee.
- Involve communities in energy decision making.
- Strategic energy vision, vision statement, goals, and objectives.
- NANA Region Energy Summit.
- Energy program metrics.
- Forecast energy demand in the NANA Region.
- Identify and evaluate the costs and benefits of energy options.
- Identify alternative power users.
- Develop a funding and financing strategy white paper.
  Participate in energy forums. Disseminate results of the plan and energy options analysis.
NANA SEP  Technical Assistance

Needs

“Leverage Alaska experiences, but look to the marketplace of ideas/experiences”

- Decision making models- energy options analysis
- NANA Energy Summit technical support
- Community Energy Planning
- Economic and Financial Modelling of Energy Options.
- Public Involvement and Educational Materials.
NANA Region Energy Security: Wind Resource Assessment Program

Feasibility Study

- **SO 1:** Identify wind monitoring sites and initiate wind data collection.
- **SO 2:** Collect wind data and communicate preliminary data to project stakeholders for one year.
- **SO 3:** Analyze one year of wind data for technical and economic feasibility and prioritize wind power generation sites for development in the NANA region. Identify undeveloped NANA Wind Resource...
KEA-Wind-Diesel System

- Lower electricity costs for consumers
- Minimize risk of diesel fuel spills
- Energy independence from state support
- Local economic development, including local jobs
NANA WRAP Activities

- Wind Energy Regime Qualification/Quantification
- Identify energy needs of regional interests
- Technical and Economic Viability of the Proposed Project
- Assessing a Wind/Hybrid System Impact on the NANA Region
- Environmental, Archaeological, and Historical Assessment
- Leadership and Community Involvement
Technical Assistance—WRAP

“Leverage Alaska Experiences in Wind-Diesel Systems and feasibility analysis”

• Technical Assistance in the Analysis of Data.
• Participation at technical committee meetings.
• Economic and Financial Modelling of Energy Options.
• Anemometer Loan Program.
• Public Involvement and Educational Materials.
Geothermal Assessment Program
Feasibility Study

- **SO 1**: Identify potential geothermal sites in the NANA Region.

- **SO 2**: Undertake a geological, geochemistry, and geophysical assessment of targeted sites for geothermal power generation potential.

- **SO 3**: Ascertain geothermal feasibility potential for power generation in the NANA Region.

Chena Hot Springs Geothermal Demonstration Project
# Kotzebue Geothermal Resource

- **Accessibility**: 0 mile
- **Distance from load center**: Good
- **Distance from power line**: 0 Miles
- **Land status**: Private
- **Environmental sensitivity**: Low
- **Degree of development to date**: None
- **Exploration status**: Minimal
- **Surface temperature**: 0
- **Estimated subsurface temperature**: 160 degrees
- **Number of wells drilled**: 2
- **Projected use**: Power, District Heating

Source: DOE/AEA Pre-Feasibility Analysis-literture review
NANA GAP Activities

- Literature Review of the geology
- Geology/Geochemistry Site Assessment and Survey
- Geophysical Assessments
- Power Optimization Modeling.
NANA GAP Technical Assistance

“Promote Alaskan experience, but look to outside for needed technical assistance”

- Development of the scoping document.
- Identifying the technical team
- Technical Assistance in the Analysis of Data.
- Economic and Financial Modelling of Energy Options
- Public Involvement and Educational Materials.
### Obstacles vs. Pathways

<table>
<thead>
<tr>
<th>Obstacles</th>
<th>Pathways</th>
</tr>
</thead>
<tbody>
<tr>
<td>“Turf Wars”</td>
<td>Consensus on Energy Security; leverage steering committee.</td>
</tr>
<tr>
<td>Lack of appropriate technology relevant for the Arctic</td>
<td>Technological breakthroughs, including NW 100, UTC Power Purecycle 200, remote monitoring and control systems</td>
</tr>
<tr>
<td>Reliability &amp; integration</td>
<td>Increased collaboration with providers; promotion of the steering committee</td>
</tr>
<tr>
<td>Technical expertise</td>
<td>Leveraging local/state experience; increased research in key areas (foundation design)</td>
</tr>
<tr>
<td>Increased cost planning, design, &amp; construction of facilities</td>
<td>Amalgamated, integrated facilities</td>
</tr>
<tr>
<td>Redundant and emergency generation still needed</td>
<td>Leverage School District and other village facilities for redundancies</td>
</tr>
<tr>
<td>Uncertain Funding Environment</td>
<td>Coordinate proposal; develop alternative business models.</td>
</tr>
</tbody>
</table>
NANA Region Energy Security:
Regional Planning, Wind, Geothermal, and other feasibility studies

• Hedge against rural to urban migration
• Hedge against future emergency events
• Hedge against increasing fuel costs
• Hedge against increasing transportation costs
• Hedge against fuel rationing
• Hedge against increase design/build costs of energy systems
Thank you!
Questions?