House Energy Committee
Overview: History & Current State of the Railbelt Electric Utilities

February 28, 2017

Presented by:
Chairman, Bob Pickett
The RCA has authority to regulate public utilities and pipeline carriers providing service in the state, currently monitoring over 600 certificated utilities and pipelines. The RCA regulates a broad range of services, from small water and wastewater systems to large telecommunications, electric, natural gas, and pipeline monopolies.

The RCA assures reliable utility and pipeline service is provided with just and reasonable rates to consumers in Alaska.

The RCA also jointly administers the Power Cost Equalization (PCE) program with the Alaska Energy Authority (AEA), establishing PCE levels for participating electric utilities.

Governing statutes
- AS 42.04 Regulatory Commission of Alaska (AS 42.04.010-AS 42.04.080), enacted 1999
- AS 42.05 Alaska Public Utilities Regulatory Act (AS 42.05.141-AS 42.05.990), enacted 1970
- AS 42.06 Pipeline Act (AS 42.06.055 – AS 42.06.640), enacted 1981
- AS 42.08 In-state Pipeline Contract Carrier (AS 42.08.010-AS 42.08.540), enacted 2013
- AS 42.45 Rural & Statewide Energy Programs (AS 42.45.010-AS 42.45.990), enacted 1993
Railbelt Service Area
# Railbelt Installed Generation Capacity (MW) 2016

<table>
<thead>
<tr>
<th>Utility</th>
<th>Thermal Capacity</th>
<th>Bradley Lake Capacity</th>
<th>Eklutna Lake Capacity</th>
<th>Cooper Lake Capacity</th>
<th>Eva Creek Capacity</th>
<th>Total (MW)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MEA</td>
<td>170.0</td>
<td>16.1</td>
<td>6.7</td>
<td>0.0</td>
<td>0.0</td>
<td>192.8</td>
</tr>
<tr>
<td>HEA</td>
<td>193.5</td>
<td>14.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>207.5</td>
</tr>
<tr>
<td>CEA</td>
<td>517.6</td>
<td>35.6</td>
<td>12.0</td>
<td>20.0</td>
<td>0.0</td>
<td>585.2</td>
</tr>
<tr>
<td>GVEA *</td>
<td>334.0</td>
<td>19.8</td>
<td>0.0</td>
<td>0.0</td>
<td>24.6</td>
<td>378.4</td>
</tr>
<tr>
<td>ML&amp;P **</td>
<td>407</td>
<td>30.3</td>
<td>21.3</td>
<td>0.0</td>
<td>0.0</td>
<td>458.6</td>
</tr>
<tr>
<td>SES</td>
<td>15.6</td>
<td>1.2</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>16.8</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>1637.7</td>
<td>117.0</td>
<td>40.0</td>
<td>20.0</td>
<td>0.0</td>
<td>1839.3</td>
</tr>
</tbody>
</table>

GVEA * Healy 2 (50) 2017
ML&P **2017 add 120MW for Plant 2A
## Railbelt Utilities Peak Load 2010-2015 (MW/h/yr)

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>HEA</td>
<td>860</td>
<td>866</td>
<td>887</td>
<td>862</td>
<td>734</td>
<td>800</td>
</tr>
<tr>
<td>MEA</td>
<td>1,291</td>
<td>1,324</td>
<td>1,376</td>
<td>1,346</td>
<td>1,312</td>
<td>1,347</td>
</tr>
<tr>
<td>ML&amp;P</td>
<td>1,950</td>
<td>1,946</td>
<td>1,932</td>
<td>1,903</td>
<td>1,814</td>
<td>1,824</td>
</tr>
<tr>
<td>CEA</td>
<td>4,515</td>
<td>5,154</td>
<td>5,089</td>
<td>5,420</td>
<td>4,670</td>
<td>2,620</td>
</tr>
<tr>
<td>GVEA</td>
<td>2,016</td>
<td>2,184</td>
<td>2,179</td>
<td>2,183</td>
<td>2,099</td>
<td>2,147</td>
</tr>
</tbody>
</table>

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![Graph showing peak load from 2010 to 2015 for different utilities](image-url)
Matanuska Electric Association (MEA) Service Area
CPCN # 18  63,000 customers
MEA’s Eklutna Generation Station (EGS)

• MEA’s EGS, a new 171-megawatt natural-gas-powered power plant in Eklutna, Alaska.
• EGS went online May 1, 2015 with 10 Wartsila generators, (17 MW each).
• Costs $324 million
• Originally scheduled to start January 2015
• Only 40% engines online January 2015
Chugach Electric Association (CEA)
CPCN # 8  Service Area  69,000 customers
Southcentral Power Project (CEA/ML&P)
Three Natural Gas Turbines, One Steam Turbine: 200 MWs Capacity

Turbine

<table>
<thead>
<tr>
<th>Turbine No.</th>
<th>Capacity</th>
<th>Type</th>
<th>Cost</th>
<th>Schedule</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. 10</td>
<td>57.4 MWs</td>
<td>Mitsubishi power steam turbine (ST)</td>
<td>$359 million (Under budget)</td>
<td>January 31, 2013 (Ahead of schedule)</td>
</tr>
<tr>
<td>No. 11</td>
<td>47.6 MWs</td>
<td>GE LM6000 combustion turbine (CT)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No. 12</td>
<td>47.6 MWs</td>
<td>GE LM6000 combustion turbine (CT)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No. 13</td>
<td>47.6 MWs</td>
<td>GE LM6000 combustion turbine (CT)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total*</td>
<td>200.2 MWs</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*ML&P is a 30% owner and receives 30% of the power
Baseload generation of Beluga combined cycle Units 6, 7, and 8 (218 MW total) were replaced by 200 MW from SPP

<table>
<thead>
<tr>
<th>UNITS</th>
<th>TURBINE</th>
<th>INSTALLED</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit # 8</td>
<td>53 MW  single-pressure steam turbine</td>
<td>1979</td>
</tr>
<tr>
<td>Unit # 7</td>
<td>80 MW  gas turbine</td>
<td>1978</td>
</tr>
<tr>
<td>Unit # 6</td>
<td>79 MW  gas turbine</td>
<td>1975</td>
</tr>
<tr>
<td>Unit # 3</td>
<td>65 MW  gas turbine</td>
<td>1973</td>
</tr>
<tr>
<td>Unit # 2</td>
<td>20 MW  gas turbine</td>
<td>1968</td>
</tr>
<tr>
<td>Unit # 1</td>
<td>20 MW  gas turbine</td>
<td>1968</td>
</tr>
</tbody>
</table>
Anchorage Municipality Light & Power (ML&P)
CPCN # 121   Service Map   31,000 customers
120 (MW), 2x1 combined-cycle, natural-gas-fired power generation
Two GE LM6000 PF Combustion Turbine Generators
One steam unit
Costs over $275 million
Start up 1st quarter 2017
Homer Electric Association (HEA)
CPCN # 32   Service Area   30,000 customers
HEA’s Nikiski Combined Cycle Plant

- A steam turbine in conjunction with an existing natural gas turbine, producing a total of 80 MW of power.
- On January 1, 2014, HEA began an independent power generation to serve its load (CEA no longer serves HEA).
- Costs $95 million
- Other HEA Generation plant costs: Soldotna Combustion Turbine $77.5 million; Bernice Combustion Turbine $15.4 million
- **Total HEA generation Plant Costs = $187.9 million**
Bradley Lake Hydro

- 120 MW hydroelectric plant
- Two 60 MW generators
- Completed September 1991
- Costs $328 million
- Power shared by Six Railbelt Electric Utilities (CEA, ML&P, MEA, GVEA, HEA and City of Seward).
(1) a wholesale agreement for the sale of power from a project licensed by the Federal Energy Regulatory Commission on or before January 1, 1987, and related contracts for the wheeling, storage, regeneration, or wholesale repurchase of power purchased under the agreement, entered into between the Alaska Energy Authority and one or more other public utilities or among the utilities after October 31, 1987, and before January 1, 1988, and amendments to the wholesale agreement or related contract, and the wholesale agreement or related contract assigned by the Alaska Energy Authority to a joint action agency formed under AS 42.45.310 that purchases the project from the Alaska Energy Authority, are not subject to review or approval by the commission until all long-term debt incurred for the project is retired, or, for a wholesale agreement or related contract assigned to a joint action agency formed under AS 42.45.310, until all long-term debt incurred to pay the purchase price to the Alaska Energy Authority is retired; and

(2) a wholesale agreement or related contract described in (1) of this subsection may contain a covenant for the public utility to establish, charge, and collect rates sufficient to meet its obligations under the contract; the rate covenant is valid and enforceable. [Emphasis added]
Golden Valley Electric Association (GVEA) Service Area
CPCN # 13        40,000 customers
North Pole Expansion Power Plant 60 MW

- Completed March 2007
- Cost $100 million
- Petro Star built a new 600-ft. pipe to supply a naphtha-blended fuel July 2016.
- Generator can be fueled by Natural Gas if available
GVEA’s Eva Creek Wind Farm

• 24.6 MW  12 Senvion turbines
• 410 foot tall wind turbines (base to Blade Tip)
• Cost $93 million
• Commissioned January 7, 2013
In 1989 the U.S. DOE’s Clean Coal Technology Program for Healy Clean Coal Plant (HCCP)
HCCP in 1998 began burning coal
HCCP failed in 1999 during test phase
Costs $305 million for construction plus the $44 million GVEA paid AIDEA for the plant
Also $98 million for the costs of the Consent Decree Stipulation
Total costs $447 million (not including the latest start up costs)
HCCP change its name to Healy Unit 2 in 2012
On December 4, 2013, the purchase of Healy Unit 2 was finalized. Golden Valley paid $44 million to Alaska Industrial Development and Export Authority (AIDEA) for the 50 MW coal power plant
Experience a fire/explosion on March 3, 2016, during commissioning test
Healy Unit 2 is expected to resume operation by mid 2017
Alaska Environmental Power (AEP) Wind Farm

- Two 900 kW wind turbines
- One 100 kw turbine
- Sells two MW to GVEA since 2010
- Cost $8.3 million: Grant from AIDEA $6.3 million; matching $2 million
• Fire Island Wind LLC owns and operates a 17.6 megawatt wind turbine project on Fire Island,
• The project began in the fall of 2012
• FIW has a long-term power purchase agreement with Chugach Electric Association. The 25-year agreement provides a flat net price of $97/MW-hour.
Alaska Electric Light & Power (AEL&P)

CPCN # 1   Service Area   16,300 customers
The Lake Dorothy Project
Lake Dorothy Hydroelectric
Placed in production on 8-31-2009

Lake Dorothy Project Data

- Capacity: 14.3 MW
- Average annual energy: 75 GW hours
- Cost: $70 million
- Lake Dorothy elevation: 2,423'
- Lake Dorothy tap: 143' below surface
  - Tunnel: 900' long
  - Outlet pipe: 48” diameter
- Bart Lake elevation: 1,009'
- Bart Lake dam: 34' high
- Penstock length: 8,249'
- Diameter: 60”
- Powerhouse: 50’ x 60’ x 50’
- Transmission line: 3.5 miles at 138 kV

Permitting began August 1995.
Construction began May 2006.
Alaska Power Company (APC)
CPCN # 2 Service Area 7,200 customers
<table>
<thead>
<tr>
<th>Load Centers</th>
<th>Chistochina</th>
<th>Healy Lake</th>
</tr>
</thead>
<tbody>
<tr>
<td>Haines and Skagway</td>
<td>Whale Pass</td>
<td></td>
</tr>
<tr>
<td>Craig/Klawock</td>
<td>Naukati</td>
<td></td>
</tr>
<tr>
<td>Hydaburg</td>
<td>Tok/Dot Lake/ Tetlin</td>
<td>Mentasta</td>
</tr>
<tr>
<td>Hollis</td>
<td>Allakaket and Alatna</td>
<td></td>
</tr>
<tr>
<td>Kasaan</td>
<td>Bettles and Evansville</td>
<td>Slana</td>
</tr>
<tr>
<td>Thorne Bay</td>
<td>Eagle and Eagle Village</td>
<td></td>
</tr>
<tr>
<td>Coffman Cove</td>
<td>Northway and Northway Village</td>
<td></td>
</tr>
</tbody>
</table>
Alaska Village Electric Cooperative, Inc. (AVEC)
CPCN # 169  Serves 11,000 customers in 57 villages
AVEC, continued

• AVEC provides electricity to rural Alaska since 1968
• Sold 113 million kilowatt hours (kWh) in 2015
• Revenue $58,642,290 in 2015
• Net Margins $ 3,951,497 in 2015
• 4 % power from Wind Turbines in 2015
Inside Passage Electric Cooperative (IPEC)
CPCN # 240   1072 customers

Four Southeast Communities

• Angoon – 236 customers  Diesel Generation
• Hoonah – 469 customers  Diesel Generation
• Kake -- 303 customers  Diesel Generation
• Klukwan – 64 customers  Diesel Generation
<table>
<thead>
<tr>
<th><strong>Finding No.1</strong></th>
<th><strong>Recommendation No.1</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>• Railbelt system requires institutional reform</td>
<td>• Create an independent transmission company (ITC) to operate system</td>
</tr>
<tr>
<td>• Legacy power purchase agreements limit efficiency</td>
<td>• ITC should be certificated and regulated as a public utility under AS 42.05</td>
</tr>
<tr>
<td>• No significant State funding available</td>
<td><strong>Finding No.2</strong></td>
</tr>
<tr>
<td></td>
<td>• System-wide merit order economic dispatch will bring maximum benefit to ratepayers</td>
</tr>
<tr>
<td></td>
<td>• Loose power pools should be encouraged in the interim</td>
</tr>
<tr>
<td></td>
<td>• Voluntary power pooling strategies and quarterly reports shall be filed with the Commission</td>
</tr>
<tr>
<td><strong>Finding No.2</strong></td>
<td></td>
</tr>
<tr>
<td>• Dispatch on a system-wide basis does not occur</td>
<td></td>
</tr>
</tbody>
</table>
**Finding No.3**
- Many past efforts to reform have failed
- Skepticism exists towards electric utilities ability to voluntarily reform grid
- Reliance on state appropriations and lack of trust have created a dysfunctional history

**Finding No.4**
- Not all electric utilities have adopted the same standards
- Intertie Management Committee (IMC) was created including: CEA, GVEA, MEA, ML&P
- HEA adopted a modified version of the Railbelt reliability standards

**Recommendation No.3**
- History indicates that current voluntary transmission restructuring may fail
- Failure of the voluntary efforts and initiatives will trigger compulsory action by the Commission

**Recommendation No.4**
- Enforceable and consistent Railbelt operation and reliability standards are necessary
- Develop a common Railbelt operating and reliability standard
- Commission strongly encourages the IMC and HEA to resolve their differences
<table>
<thead>
<tr>
<th><strong>Finding No.5</strong></th>
<th><strong>Recommendation No.5</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>• Recommendation Nos.1-4 will be challenging and time consuming</td>
<td>• Initial action steps will need to be implemented within existing RCA resources</td>
</tr>
<tr>
<td>• Full implementation of proposed electrical system structural changes will take approximately five to ten years</td>
<td>• Commission receives the necessary Administration and Legislative support in order to implement these proposed recommendations</td>
</tr>
<tr>
<td>• Many parties must cooperate or this effort will fail</td>
<td></td>
</tr>
</tbody>
</table>

Commission’s Findings and Recommendations – Special Public Meeting on June 29, 2015 (continued)
USO and Transco

• **Unified System Operator ("USO")**: Entity that would operate common system-wide security-constrained economic dispatch with post-dispatch financial settlement. The USO would create planning protocols and reliability standards.
  • This differs slightly from an **Independent System Operator ("ISO")** in that it would not operate complex trading arrangements such as day ahead and other procurement arrangements.

• **Transco**: a transmission-only **utility** tasked with the responsibility for both area-wide and inter-area transmission planning and development, and field operations and maintenance of transmission assets. Transmission investment would be made in accordance with the USO planning protocols and subject to RCA prudence review and pre-approval.
Chugach Board of Directors authorized the Chief Executive Officer to enter a non-binding Memorandum of Understanding and associated confidentiality agreements with American Transmission Company (ATC) and other Railbelt utilities to further the work of the Joint Development Agreement subcommittees and collaboratively define the business and organizational structure of a USO/Transco that conforms to our guiding principles. And, subsequently, develop the business plan for this organization in sufficient detail to support regulatory approval.
Power Pooling and Joint Dispatch
Agreement by Chugach/MEA and ML&P (1/27/2017)

• Agreement provides a contractual framework for coordinated scheduling, dispatch, and settlement transactions among the Parties for the purchase, sale, or exchange of energy, capacity, reserves, and transmission ancillary services on an efficient and economic basis using the Parties’ respective most efficient generation and transmission resources.

• Saving up to $16 million per year estimated by the Utilities.
The PCE program is a state-funded program designed to equalize power cost per kilowatt hour statewide, with a target cost based on the average cost per kilowatt hour in Anchorage, Fairbanks, and Juneau. To accomplish this, the PCE program provides economic assistance payments to eligible electric utilities based on electric sales to community facilities and residential customers. Generally, PCE reduces the effective rate per kilowatt hour up to 500 kilowatt hours per month for a residential customer (community facilities receive up to 70 kilowatt hours a month for each community resident).

The Railbelt electric utilities, the electric utility in Juneau and those utilities that receive electric power from the Four Dam Pool facilities (Ketchikan, Wrangell, Petersburg, Kodiak, Glennallen, and Valdez) are not eligible for PCE.

In FY15 PCE program provided funding to 190 communities, resulting in 83,426 people receiving approximately $37.3 million in PCE disbursements.
The RCA establishes the PCE rate applicable to each utility participant’s billings, calculating the PCE for non rate-regulated PCE recipients as well as electric utilities subject to RCA rate regulation. The RCA notifies PCE recipients of the base rate and reviews annual reports filed by nonregulated entities to ensure appropriate use of PCE funding. The RCA must also recalculate the PCE rate when AEA changes the PCE funding level or the legislature adjusts PCE limits. Costs used to calculate the amount of PCE for both regulated and nonregulated utilities include all allowable costs, except return on equity, used by the RCA to determine the revenue requirement for electric utilities subject to rate regulation. A non rate-regulated utility sets its rates without RCA oversight, but must submit information that allows the RCA to determine the PCE level for the utility.
AEA administers the PCE program based on PCE rate determinations by the RCA. Eligible utilities submit monthly reports to AEA that document the eligible power sold and PCE credits applied to eligible customers’ bills. AEA issues payment to the PCE-eligible utilities on a monthly basis based on the PCE level established by the RCA, multiplied by the eligible kilowatt hours sold in the preceding month to all eligible customers. AEA verifies the eligibility of customers and of community facilities. In addition, AEA calculates the required pro-rated PCE levels based on available funds. If there are not enough funds to pay for the costs of the program in a given fiscal year, the PCE levels are reduced.
PCE Eligible Communities 190 communities