



27th Legislative Update

*Representing Eagle River Valley,
South Fork, Stuckagain Heights,
South Anchorage, Indian, Bird,
Girdwood, Whittier, Portage,
and Hope*



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Summary of major Alaska energy issues

Alaska doesn't face a resource-based energy shortage; we face a politically-induced shortage...

This summary is meant to be a brief overview of the many options and resources available to Alaska.

Prudhoe Bay/North Slope production decline averages 6% per year

The Trans Alaska Pipeline System (TAPS) transports our North Slope oil but the amount of oil passing through the line has fallen from 2 million barrels at its peak in 1988 to about 650,000 barrels per day today. The decrease in TAPS throughput equals 100 barrels per day. Instead of 4 days to reach Valdez, it now takes 15 days. Implications of this:

- 1) Slower flow means that the oil cools from about 110 degrees down to about 34 degrees by the time it reaches Flint Hills refinery in North Pole. The refinery adds heat to the oil in the refining process, and puts the oil back in TAPS at a restored 110 degrees, facilitating its journey to Valdez.
- 2) Cooling oil means wax precipitating out and coating the inside of the pipeline. The oil used to move at 7.4 miles per hour in the pipeline; now it flows at about 2.2 mile per hour.
- 3) Water separates out at lower flow rates, causing ice in the winter and possible corrosion issues.
- 4) Lower volumes mean that anticorrosive agents do not reach all areas of the pipe.

New oil exploration

In the 2010-2011 season, only one new exploration well was drilled (Brooks Range Petroleum). The drilling season is limited on the North Slope to mid-November through the end of March.

Great Bear Petroleum is proposing hydro-fracturing process in the southern North Slope area. While they are proposing 200 wells per year for 45 years, they will need permanent roads (not just seasonal ice roads) and numerous drill rigs to accomplish this. Great Bear projects new oil in TAPS by 2013. Some see this timeline as very optimistic.

Repsol is partnering with Armstrong to explore some smaller fields.

Natural Gas

There are multiple proposals for commercializing our North Slope natural gas and delivering affordable gas to Alaskans. A “**big pipe**” (48” diameter) is being planned and advanced by the state’s partners **TransCanada and ExxonMobil** (the Alaska Pipeline Project), which includes two scenarios, **1.**) a pipe to deliver gas through Canada to the lower 48, and **2.)** a pipe to deliver gas to Valdez for Liquid Natural Gas (LNG) export. Another big pipe project by **ConocoPhillips and BP** (the Denali Project) also proposes to take gas through Canada to lower 48 markets.

The **Alaska Gasline Port Authority**, with partners **Sempra LNG & Mitsubishi**, proposes a pipeline (the All-Alaska Gasline) to a Valdez LNG export facility but with spur lines from Glennallen to the existing Southcentral gas grid.

A strictly **in-state gas** (the Alaska Stand Alone Gas Pipeline - ASAP) pipeline would deliver NS gas to the Railbelt, and which would likely require significant financial support by the state. The ASAP project, a small pipe (24” diameter) foresees delivery of 1st gas in half the time (by 2016) as the big pipe projects. This pipeline could not carry more than half a billion BCF of gas, due to terms of the AGIA contract.

Propane

Propane could serve as an economic source of energy in rural Alaska. It is a useful fuel for electric generation, burning cleanly and efficiently. It integrates more effectively with wind generated power. Propane can be transported via road, river, rail or coastal barge. The Alaska Natural Gas Development Authority has been exploring access to commercial quantities at an affordable price supplied to rural Alaska.

Cook Inlet Gas Storage

With the suspension of export from the Nikiski Liquid Natural Gas (LNG) facility, and anticipated growth in demand for natural gas in Anchorage and surrounding communities, an effort to provide a storage facility for natural gas is currently underway. Cook Inlet Natural Gas Storage Alaska (CINGSA) is a partnership between Enstar parent company Semco Energy and MidAmerican Energy. It would build a facility to inject gas into underground reservoirs when consumption is low and production high (summer) for use when demand is up in the winter. The project is currently working to overcome licensing, permit and land use issues.

Liquid Natural Gas (LNG) Import Option

Alaska has exported LNG for the past 40 years through the Conoco-Phillips/Marathon facility at Nikiski. This exportation has allowed natural gas producers to keep wells flowing at a steady state year-round, regardless of the fluctuating demand by consumers. When well flow is “turned down”, the wells may fail to ramp back up again, and production could be lost.

Natural gas wells in Cook Inlet are decreasing in production. Studies indicate that we will not have sufficient supplies by 2013. Therefore, there is discussion of the option of importing LNG, which may be the most economic way to provide natural gas to customers in Anchorage, Mat-Su, and on the Kenai in the near-term. Very large quantities of natural gas are being produced in the Lower 48 as well as western Canada. This may provide the most economic source of imported natural gas.

Cook Inlet Natural Gas

Strong evidence exists that large stores of natural gas are yet to be discovered in Cook Inlet, and, if so, this could meet the Southcentral demand for a number of years to come. Right now there is a jack-up rig bound for Alaska. (A jack-up rig is configured to drill in more shallow waters. There are only a few of these rigs in the world.)

The company bringing the rig will be exploring a site called Kitchen Lights, which is a large unit in upper Cook Inlet thought to hold both oil and gas. They hope to be drilling by early summer, if they are able to negotiate some requirements. First, they must be approved by US Department of Homeland Security to bring the rig into the Inlet, in compliance with the Jones Act, federal law. They will then have to pass inspection by the Alaska Oil and Gas Conservation Commission (AOGCC) after installing a blow-out preventer on the rig.

The State of Alaska will pay 100% of the cost, up to \$25 million, for the first well drilled in Cook Inlet using a jack-up rig. There are also significant tax credits for the second and third wells drilled, but only if drilled by different companies using the same rig.

Apache is exploring in Cook Inlet for oil, using new seismic technology. They will likely find new natural gas, as well.

Hydro Power

The Watana Dam (the proposed smaller dam on the Susitna River) is projected to cost somewhere in the range of \$4 billion. This would be a roller compacted concrete dam. (Older construction techniques for a conventional earth-filled dam would cost an estimated \$ 6-8 billion.) Output would be about 50% of the Railbelt's electric need. Cost to residential customers could be in the range of 20 cents per kilowatt hour (kWh), without state investment in the project. It is estimated to take 11 years to first power. Additional cost would include about \$1 billion for transmission.

The Alaska Energy Authority (AEA) has a contract with MWH, an international engineering firm experienced in large hydro projects. MWH is preparing the Federal Energy Regulatory Commission (FERC) application required for this project. The Governor has requested \$65.7 million in his FY2012 budget to advance the Susitna/Watana project which is the balance of the Railbelt Energy Fund.

Another hydro project under consideration recently has been the Chakachamna project across Cook Inlet from Anchorage. This project would supply about 300 megawatts; it might initially cost less than Susitna, but raises more environmental issues and, as proposed, generates less power.

These hydroelectric projects would allow Alaska to achieve 50% of our energy from renewable sources by 2025. This benchmark was established in the state's sustainable energy policy.

Geothermal

Mount Spurr is said to have world class geothermal energy potential. ORMATS is the company proposing to develop this and they are doing drilling to define the resource. ORMATS has suggested that geothermal power would cost 12 cents/kWh (wholesale), but this does not include infrastructure to deliver the power, which may bring the retail cost up to closer to 20 cents/kWh.

Geothermal regulation falls under the Alaska Oil and Gas Conservation Commission, rather than the Federal Energy Regulatory Commission (FERC). Other locations throughout Alaska also provide potential for geothermal power generation.

Bernie Karl at Chena Hot Springs has proven that low temperature geothermal resources can be put to use generating electricity, heating greenhouses, and even keeping ice castles cold in the summer. This power plant produces 400 kilowatts per day and has reduced the cost of power from 30 cents per kilowatt hour for diesel generation to less than 6 cents/kWh for geothermal.

Nuclear

Nuclear power is an emerging technology. Alaska Center for Energy and Power (ACEP) is reviewing the nuclear power opportunities for Alaska. Presently, no companies have developed small scale nuclear power plants appropriate for small community power needs of 1 megawatt or smaller. The small plant industry is moving forward but is still early in development.

Pebble-bed nuclear plants, of the type designed by Toshiba Corporation, could be an ideal solution for many medium-sized communities in rural Alaska. While these power plants have hot, radioactive fuels in them, they are not “reactors” in the generally-understood definition, as there is no reaction going on; the fuel is hot and degrading, creating steam to run a turbine connected to a generator. As designed, the pebble-bed nuclear plant would sit underground and need to have its fuel replenished after 30 years. As stand-alone plants, they could provide all the electricity needed by a community, mine or other industrial facility. At current estimates, they would cost about \$150 million. However, given the current catastrophe occurring in Japan, nuclear has a new black eye.

Tidal

With many locations along the coast of Alaska providing the most extreme tidal changes in the nation twice a day, this form of renewable energy should be explored. However, given the environmental challenges relating to shorelines, impacts to tidal ecosystems, overcoming corrosion and other mechanical issues, the state must be careful how it invests in these ideas.

One company, Ocean Renewable Power Company has developed a turbine generator unit that is being deployed in Maine. They believe it may be useful in Alaska and plan trials in Cook Inlet and the Tanana River. They say that Alaska has 95% of the country’s total tidal power potential, estimated to be 109 TWh per year. Federal permits and issues such as silt and debris in the water (trees), as well as belugas, will be challenges. Costs for tidal energy were quoted to be on par with wind energy.

Coal Gasification

The conversion of coal to gas, and then to “white diesel” provides many possibilities for Alaska, given our huge reserves of coal. Consideration of a plant at Beluga, where coal is basically at tidewater, has been looked at. Logical markets for the sulfur-free fuel include Taiwan or large cities on the US West Coast where air pollution from trucks and buses is a significant problem. Cook Inlet Region Inc. (CIRI) is in the early phase of an Underground Coal Gasification (UCG) plant which would deliver electricity to the Southcentral area.

Wind

Numerous wind projects are either under consideration, seeking permits, or actually producing energy in Alaska. One of the major drawbacks of wind power is interfacing the power production with the existing grid. Power companies must modify their own generation as wind production increases on windy days, but must then quickly ramp up power when the wind stops blowing. Current wind farms can be found at Delta Junction, Kodiak, and in western Alaska. At Fire Island, in Cook Inlet near Anchorage, Cook Inlet Regional Incorporate (CIRI) is currently making plans to erect a wind farm to supplement local power.

Wind power is intermittent, dependent on the variations in wind velocity. Because of this, a backup power source is required to prevent black-outs. This could be continuously operating gas or diesel powered turbines, or, with an emerging technology, a battery backup system. The University of Alaska Fairbanks is working to develop batteries that could serve that purpose, along with researchers in other parts of the U.S.

Biomass

Numerous recent, small-scale biomass projects are now demonstrating the savings potential of using our own natural resources for heating and power generation. These include projects on Prince of Wales Island, where biomass from a local mill provides heat for the school swimming pool; at Juneau, where the Sealaska headquarters building is now heated by biomass; and Tok, where acres of black spruce surrounding the town are harvested as wild fire protection, providing biomass for heating the school. Tok is also working with the local electrical utility to convert from oil to biomass, which could reduce the annual \$1 million Power Cost Equalization (PCE) subsidy.

Cost of Power in Rural Alaska

“Power Cost Equalization” (PCE) is a program that assists rural communities where energy costs are three to five times that of more urban areas. Roughly 78,000 people and 83 utilities in 184 communities benefited from the program last year, according to the Alaska Energy Authority (AEA) which administers the program.

Residential customers are eligible for PCE credit for up to 500 kWh/month/customer. In order to participate in the program, electric utilities must demonstrate high costs and use diesel fuel for most of their power generation. The Regulatory Commission of Alaska (RCA) works with the AEA to administer the program.

Currently utilities throughout rural Alaska are recipients of about \$32 million, in PCE payments annually. The Senate Finance Committee is currently proposing an additional appropriation of \$400 million to endow the PCE program. This would be added to the \$300 million already set aside, creating an endowment of \$700 million, adequate to spin off 5% annually.

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**Representative Pruitt,
Representative Wilson and
Senator Giessel at Kuparuk**