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*Electric Utility Restructuring Report
to the
Alaska Legislature
and the
Alaska Public Utilities Commission*

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Timeline

<u>Step</u>	<u>Day #</u>	<u>Date</u>	<u>Description</u>
1.	1	18-Jan -99	Anticipated Contract start date
2.	11	29-Jan	Data Collection
3.	32	19-Feb	Benchmark Existing Operation
4.	39	26-Feb	Model Wholesale Market
5.	46	5-Mar	Model Retail Market
6.	53	12-Mar	Pilot Program Design Recommendation Delivered
7.	60	19-Mar	Cost/Benefit Analysis
8.	72	<u>31-Mar</u>	<u>Draft report delivered</u>
9.	85	13-Apr	End of Public Comment Period
10.	84-95	Mid Apr	Legislative Hearing(s)
11.	103-115	Early May	APUC Hearing
12.	163	30-June-99	Final Report Due
13.	347	31-Dec-99	Available for Consultation for this time period

Methodology

Outline of Report

- ☆ Introduction & Overview
- ☆ Recommendations
- ☆ Rural Issues
- ☆ Local Choice
- ☆ Wholesale Competition (Competitive Advantage)
- ☆ Network Integrity
 - Reliability
 - Alternative Energy
- ☆ Consumer Protection
 - Universal Service
 - Affordability
- ☆ Stranded Costs
- ☆ Taxes & Fees
- ☆ Employment
- ☆ Modeling

Task Report Structure

- ☆ Issue
- ☆ Dynamic
- ☆ Implications
- ☆ Assessment
- ☆ Key Decisions
- ☆ Focused Discussion
- ☆ Tables & Figures

Scenario 1: Fill the Pot Holes

- ☆ The system is fundamentally fixed - don't break it.
- ☆ Current flaws can be repaired with focused regulatory and legislative efforts.
- ☆ The restructuring experience in other states counsels caution.
- ☆ No need to commit to retail competition.
- ☆ Protects the structure that protects rural customers.

Scenario 2: Kilowatt Commoditization

- ☆ The system's best role is to produce efficiently priced kilowatt hours.
- ☆ Regulation imposes inefficiencies.
- ☆ Appropriate market structure can ensure efficiency.
- ☆ Experience in other states demonstrates benefits; inaction imposes opportunity costs.
- ☆ Commit to retail competition at the earliest practical date.

Scenario 3: Controlled Evolution

- ☆ A competitive system can be designed to deliver benefits to all customers.
- ☆ Current flaws and market failures can be addressed with focused regulatory and legislative efforts - rules.
- ☆ Commoditization and retail competition are tools to accomplish policy ends.
- ☆ The restructuring experience in other states counsels a long-term view.
- ☆ Commit to a date that allows policy implementation.

Rural Issues - Key Decisions

- ☆ To what extent should the likely impacts of restructuring on rural communities, rural areas, and rural consumers be defined in broader terms than short-term financial impacts?
- ☆ What level of public policy intervention is appropriate to address rural utilities' concerns regarding tax revenues, employment impacts, service quality, and loss of local control of electric service?

Rural Issues - Viewpoints

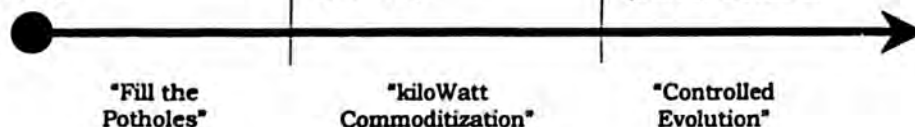
- ☆ "Rural Alaska could be devastated at this time by retail electric deregulation, [that] would encourage cherry picking of large customers, leaving small customers to bear the costs of maintaining the system."
Stephen Conn, Alaska Public Interest Research Group
- ☆ "The loss or reduction of PCE would severely retard implementation of the Rural Sanitation 2005 Action Plan."
Governor's Council on Rural Sanitation
- ☆ "Rural Alaska does not lend itself to deregulation at this time due to the size of the market and the lack of an interconnected grid."
Eric Yould, Executive Director, ARECA
- ☆ "What rural Alaska needs a lot more than competition in the electric industry is some support from Juneau to help us with building some infrastructure which will lead to economic development thus promoting and supporting healthy economies."
Robert Wilkinson, Gen. Manager, Copper Valley Electric Assoc.

Rural Issues - Agenda

Bush - Integrate APUC & DOE programs to facilitate technology development; explore virtual aggregation.
Railbelt - Uniform cost allocation methodology; transmission access rules.

Railbelt - Establish Power Exchange and Independent System Operator; adopt system-wide tariffs for ancillary services. Consider exemption or "opt-in" for non-interconnected utilities.

Bush - Conduct technology pilots. Create system benefits charge.
Railbelt - Establish rules for non-discriminatory access to transmission, power, services.



Local Choice - Key Decisions

- ☆ **Rates.** Should the state of Alaska proceed with electric industry restructuring if lower rates for residential and small business consumers cannot be guaranteed for both the short- and long-term?
- ☆ **Competitive Safeguards.** If policymakers choose to restructure, how should state regulators ensure that truly competitive generation markets will be created? Should robust wholesale markets exist before retail access is adopted? To prevent the creation of unregulated monopolies, should specific definitions of what constitutes effective competition be in place before restructuring takes place? Should state and federal agencies update and strictly enforce antitrust and other statutes to protect consumers?
- ☆ **Protection from Price Cross-Subsidization.** How should state regulators prevent the practice of cross subsidization between a company's regulated and non-regulated subsidiaries?

Local Choice - Key Decisions (cont'd)

- ☆ **Access to Information.** To what extent should consumers be able to determine and compare the prices for transmission, distribution, and retail energy services and have access to information about the generation sources of the electricity they purchase?
- ☆ **Aggregation Protection.** To what extent should the ability of consumers to aggregate their electricity purchases be protected?
- ☆ **Consumer Protections.** What is the need for state agencies to update and strictly enforce consumer protection laws to ensure fair marketing, sales and service practices? Should all sellers of electricity be licensed and be subject to penalty for license violations? What is the state policy regarding other consumer protection issues such as privacy protection; "slamming" (unauthorized switching of providers); "pre-selling" (securing customers before a supplier has the technical ability or legal authorization to provide service); fair and understandable billing; and clearly written terms and conditions of service?

Local Choice - Viewpoints

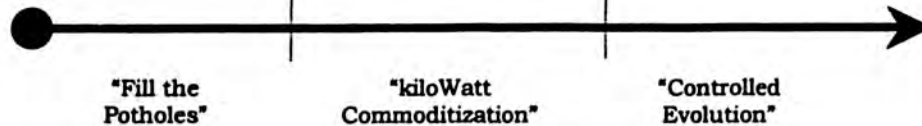
- ☆ "Through regulation and cooperative structure, Alaska's electric utility customers have already achieved many of the benefits of competition in terms of quality of service and low rates for customers."
Edwin Kozak, General Manager, Kodiak Electric
- ☆ "Railbelt consumers will be better off if regulators and utilities allow customers at the retail level to choose their retail suppliers so that the benefits of competition can begin to flow."
Chugach Electric Association
- ☆ "We believe that if electric service territory protection is to be abandoned in Alaska, the order of preference is as follows: (1) Southcentral, (2) Railbelt, (3) Bush."
Mike Kelly, Pres. & CEO, Golden Valley Electric Association

Local Choice - Agenda

Clarify and/or increase local utility control. Legislatively delegate more oversight function to utility boards.

Open access w/ "opt-in" provisions; encourage non-geographic & new geographic cooperative or preferred provider entities to increase buying power of small communities.

Use certification and regulatory powers to promote public policy goals. Adopt standards and encourage creation of new entities.



Wholesale Markets - Key Decisions

- ☆ Are the benefits, incentives, advantages and subsidies inherent in current legal, regulatory and tax structure still appropriate today?
- ☆ To what extent they should they be modified to reflect new and emerging market conditions?
- ☆ To what extent is a "level playing field" (in which all competitors are subject to the same structural, legal, and financial rules) in the best interests of the State?
- ☆ Are there certain competitive protections and advantages that should be maintained to help guide and influence a desired outcome?
- ☆ How do you measure and allocate stranded investment?
- ☆ What are the public policy standards that should guide regulatory bodies in assessing horizontal market power?
- ☆ To what extent must utility control of generation resources be broken up prior to restructuring in order to ensure the future competitiveness of markets?

Wholesale Markets - Viewpoints

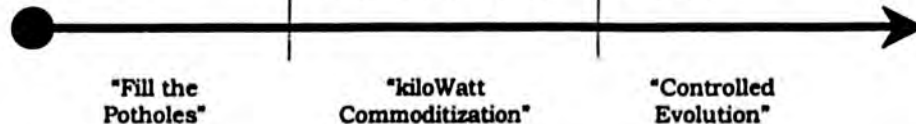
- ☆ "Wholesale competition has always existed in the Railbelt and there is no question that competition at the wholesale level has already greatly benefited Railbelt consumers."
Eugene Bjornstad, General Manager, Chugach Electric
- ☆ "Contracts protect Chugach from stranded investment - each in its own way. . . [Regarding the 'cherry picking' concern -] The KEY is, all customers must be free to choose."
Chugach Electric Association
- ☆ "There is no wholesale competition in Alaska, nor any of the competitive market mechanisms in place by which to initiate such competition."
Meera Kohler, General Manager, ML&P
- ☆ "At best, retail electric competition will be imperfect competition because there will not be numerous sellers competing with each other and the costs of facilitating competition will be substantial."
Edwin Kozak, General Manager, Kodiak Electric

Wholesale Markets - Agenda

Implement policy to encourage expansion of "merchant class" generators.
Discourage new ratebase investment in generation.
Accelerate reduction of stranded costs.

Implement Independent System Operator for transmission operation and governance.
Implement Power Exchange to increase competition and transparency in wholesale markets.

Implement rules to utilize restructuring to promote public policy goals.
Establish level playing field for all non-essential, value-added products and services.



Reliability - Key Decisions

- ☆ How do you assure reliability in the context of more open and competitive markets?
- ☆ What is the most appropriate structure to balance the needs for system reliability and open market requirements for non-discriminatory open access?
- ☆ Will remuneration be adequate to encourage transmission expansion in a timely manner?
- ☆ Will restructuring and unbundling of generation, as a competitive function, from the regulated functions of transmission and distribution result in a loss of economies of scope across functions and increase reliability costs?

Alternative Energy - Key Decisions

- ☆ Are environmental regulations and laws in force today sufficient to protect environmental values in a more competitive electric utility industry?
- ☆ Is there a serious potential for increased emissions under retail competition in the electric industry?
- ☆ If so, are there measures which should be adopted as part of restructuring which would reduce the risk of adverse environment consequences at acceptable costs?
- ☆ Is it a measure of restructuring success that viable renewable energy, energy efficiency, and other industries will offer products and services to customers?
- ☆ Are structural or financial mechanisms or provisions required to ensure that outcome?
- ☆ What kinds of mechanisms or provisions are best suited for accomplishing public policy goals in Alaska?
- ☆ To what extent should such mechanisms be included in restructuring legislation?

Network Integrity - Viewpoints

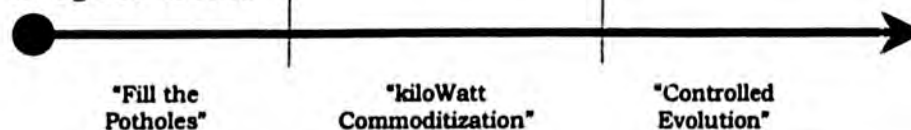
- ☆ "[Reliability] is a red herring. . . . We believe there is no significant threat [to reliability] but even if there were, there is no reason to believe that the APUC is not capable of monitoring and resolving reliability issues in the future just as they have in the past."
Eugene Bjornstad, General Manager, Chugach Electric
- ☆ "We believe there are benefits to be gained from Alaska watching and learning from electric deregulation successes and failures as they unfold in the lower 48. We believe GVEA's member-owners will be advantaged by a slow and careful approach to deregulation."
Mike Kelly, Pres. and CEO, Golden Valley Elec. Assoc.
- ☆ "We also face questions regarding reliability. When it's 50 degrees below zero, Alaska consumers want to know their electrical company can meet the demand."
Rep. Norman Rokeberg and Sen. Bert Sharp
- ☆ "The Railbelt area could benefit from restructuring of the transmission grid if set up as an independent transmission company (ITC)."
Henry Lang, PE, Consultant

Network Integrity - Agenda

Formalize service quality standards across broad range of metrics. Consider performance-based regulation mechanisms. Encourage alternative energy development through IRP or PBR.

Create Independent System Operator. Conduct proceeding to establish reliability-based must-run criteria. Establish non-discriminatory access and trading systems.

Establish policy to support development of alternative & distributed technology. Create competitive distribution service mechanisms, e.g. PBR, separations.



Universal Service - Key Decisions

- ☆ Is preserving or enhancing universal service benefits in the electricity sector an essential component of industry restructuring and the introduction of retail market competition?
- ☆ How will Universal Service be defined?
- ☆ What policy framework should be constructed for Universal Service in Alaska?
- ☆ Will restructured markets ensure that universal service benefits are retained in the absence of legislative, regulatory, or fiscal provisions?
- ☆ If such supports are deemed appropriate, what type and level of supports should be adopted?

Affordability - Key Decisions

- ☆ How should "affordability" be defined?
- ☆ Will retail competition pose a serious threat to short and long-term affordability of electric service?
- ☆ Is maintaining affordable electric service (however defined) an essential element of successful introduction of market forces into the electricity industry?
- ☆ What mechanisms should be instituted to ensure continued affordability of electric service in any restructuring legislation?
- ☆ How should affordability protection mechanisms be structured and funded to address needs in the most efficient manner?

Consumer Issues - Viewpoints

- ☆ "Everyone who receives an electrical bill could be largely affected through changes in how electrical service is delivered."
Rep. Norman Rokeberg & Sen. Bert Sharp
- ☆ "All consumers must have universal access to affordable service. [A] provider of last resort must be identified for those consumers who either do not choose or are unable to access the market due to limited market power."
ARECA

Consumer Issues - Viewpoints (cont'd)

- ☆ "The APUC should develop customer protection rules."
Mary Ann Pease, Vice President, Aurora Power
- ☆ "We think the supplier of last resort obligation should reside with the Distribution Service Provider."
Chugach Electric Association
- ☆ "If competition is undertaken this must be accompanied with protections that insure affordability and availability as a matter of public policy."
Stephen Conn, Alaska Public Interest Research Group
- ☆ "[Restructuring in Alaska] should not proceed without guaranteed lower rates for residential and small business consumers. Equitable benefit of any restructuring must ensure that rural, remote and less profitable customers are not adversely impacted."
Gary Brooks, Business Manager, IBEW Local 1547

Consumer Issues - Agenda

Formalize universal service policy. Increase customer education. Encourage innovative service offerings. Consider performance-based regulation. Formalize service quality metrics.

Establish universal service/provider of last resort. Provide uniform customer information. Strengthen regulation of distribution function. Adopt license requirements.

Use certification, license and regulatory powers to promote clearly articulated public policy goals. Consider competitive auction of distribution function, PBR. Adopt standards and encourage creation of new entities.

●
"Fill the Potholes"

"kiloWatt Commoditization"

"Controlled Evolution"

Stranded Costs - Key Decisions

- ☆ To what extent does "reasonable opportunity to earn a fair return" equate to "guaranteed recovery of investments?"
- ☆ What is the most appropriate method for calculating stranded costs?
- ☆ To what extent can stranded costs be mitigated by utilities?
- ☆ How should stranded costs be allocated?
- ☆ Over what period should allowable costs be collected?

Stranded Costs - Viewpoints

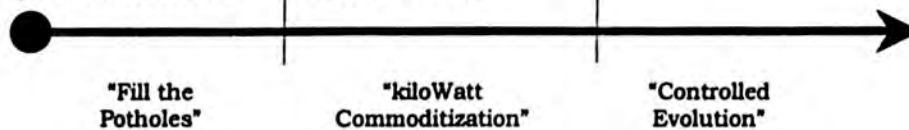
- ☆ "Stranded investment for rural Alaska is huge. . . . In the face of retail competition, utilities could lose energy sales to competing providers, which could reduce sales from the Four Dam Pool projects."
Robert Wilkinson, Gen. Mgr., Copper Valley Electric Assoc.
- ☆ "KEA's loss of ten of its largest customers alone would reduce debt service money paid to the State by approximately \$1.2 million/yr."
Edwin Kozak, General Manager, Kodiak Electric
- ☆ "If the utility's plant is needed to maintain electric system reliability there is no stranded investment. In the case of no stranded investment, it is very unlikely that retail competition would develop as there is no savings for the consumer."
Charles Walls, President & CEO, AVEC
- ☆ Consumers and the industry stand to benefit in numerous ways once choice and free-market principles are substituted for the current system."
Mary Ann Pease, Vice President, Aurora Power

Stranded Costs - Agenda

Discourage new ratebase generation, assets; encourage accelerated depreciation and shortened amortization periods. Assess & accelerate "glide path" for recovery.

Consider divestiture/asset auctions; transfer reliability requirement to independent system operator; contract reformation. Establish exemptions or "opt-in" rules for rural utilities.

Consider securitization/competition transition charge; determine must-run requirements. Condition divestiture, sale or asset transfers on rules designed to reduce stranded costs.



Taxes & Fees - Key Decisions

- ☆ What is the most effective means to create a revenue neutral position amongst government entities (state and local jurisdictions, among communities, etc.) in a restructured electric industry?
- ☆ What tax laws or rules must be changed to establish a level playing field for all electricity providers in a competitive marketplace?
- ☆ What role should the state play in attempting to mitigate the tax revenue impacts on local governments?
- ☆ To what extent should tax laws and tax incentives be used to encourage or support a specific industry, economic sector, or regions in the state?
- ☆ As a matter of public policy, there are also a number of other questions. These include: what is the most desirable type of tax or fee; who pays the tax; how does it impacts economic activity; what is the revenue potential; what is the nexus; what is the true "incidence" of the tax (who actually pays); and how does it effect Alaska's economic development potential?

Taxes & Fees - Viewpoints

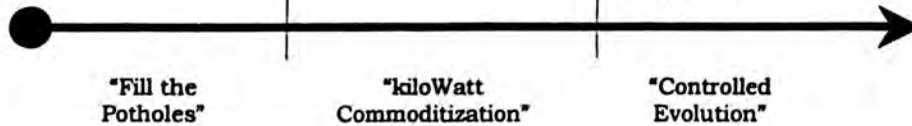
- ☆ "The tax benefits of nonprofit status and tax-exempt revenue bonds are primarily federal tax benefits. Alaska's consumer-owned utilities pay state and local property taxes."
ARECA
- ☆ "[T]here are no prohibitions on investor-owned utilities buying either cooperative or municipal utilities. In both instances, the investor-owned utility would need to buy out the debt and capital credits of the member-owned utilities. This could represent quite a penalty to the ratepayers as much of the municipal debt is tax exempt, and virtually all of the cooperative debt is at a federally subsidized rate."
ARECA

Taxes & Fees - Agenda

Encourage increased reliance on market-based financing. Consider modifications to tax law to encourage new investment, as appropriate.

Establish "level-playing field" for new investment. Consider stranded cost treatment for tax consequences of transition to competition.

Rationalize tax policy and mechanisms to advance public policy goals and non-discriminatory competitive environment. Consider use of taxes to internalize costs of public policy programs.



Utility Employees - Key Decisions

- ☆ Are unacceptable employment changes occurring in the electric utility industry today? To what extent can those changes be addressed under the current system of regulation and operations? What measures or mechanisms should be instituted today to address these adverse trends?
- ☆ Will restructuring (or the continued "preparation for restructuring" activities) cause unacceptable employment changes in the electric industry in Alaska? To what extent are those changes within the control of Alaska policy makers, and to what extent are they part of broader industry or nation-wide market forces and trends? Why are those changes unacceptable? Which adverse results are most likely to develop?
- ☆ What structural or economic mechanisms should be instituted to prevent unacceptable employment changes during the transition to and in a more competitive industry environment? How should those mechanisms be incorporated in current regulatory agendas and/or in restructuring legislation

Utility Employees - Viewpoints

- ☆ "Rapid, radical deregulation may cause electric power companies to continually restructure their business functions, resulting in constant anxiety in the work force and financial instabilities in the industry and communities. Cost-cutting measures and work force reductions are being implemented throughout the electric power industry. As a result, the existing work force and the electric systems are stressed to a point that threatens worker safety and public safety."

International Brotherhood of Electrical Workers

- ☆ "The IBEW forthrightly opposes deregulation in Alaska. Safeguards for worker and public safety and strict reliability standards must be built into any restructuring scheme in order to protect the public's best interests."

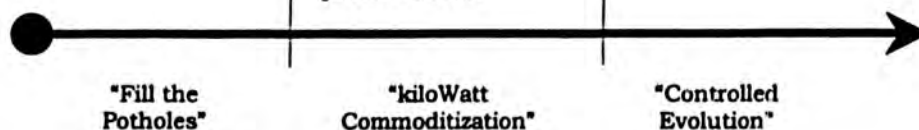
Gary Brooks, Business Manager, IBEW Local 1547

Utility Employees - Agenda

Establish or strengthen service quality standards or performance-based regulation to target worker safety and utility system operational criteria.

Create independent system operator (and funding mechanism) to ensure reliability. Regulate distribution function to ensure safe work and adequate response performance.

Establish detailed service quality, performance based, safety regulation. Encourage competition based on safe, responsive, reliable operations.



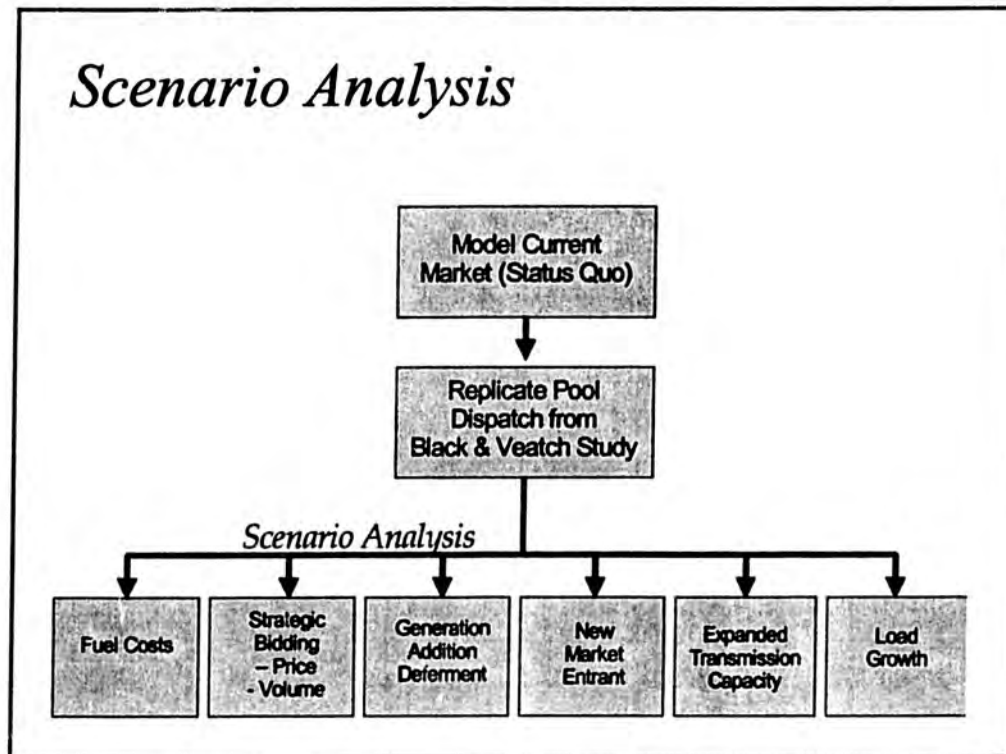
Modeling

- ☆ Computer modeling is not a crystal ball, it is an analytic tool
- ☆ Modeling competitive markets is highly dependent upon the assumptions that underlie the analysis.
 - Fuel costs
 - Plant operating characteristics
 - Timing of new entrants
 - Load growth
- ☆ This study follows on the heels of the central dispatch planning study completed by Black & Veatch International (BVI) for the APUC in October 1998.
- ☆ In order to provide consistent and useful results, we relied on input assumptions, data, and projections developed for the BVI study to the maximum extent possible.

Modeling (cont'd)

- ☆ A market dispatch model is used to simulate generation dispatch in a pool environment.
- ☆ The model dispatches generation to meet load based on generator cost, and calculates the market prices that result when the last generator is dispatched to meet the last increment of load.
- ☆ It is not an hourly operation model for real time dispatch and trading.
- ☆ For the purposes of estimating future market behavior, more complex optimization models do not necessarily yield more accurate results.
- ☆ One principal objective is to model strategic bidding behavior of market participants.

Scenario Analysis



Major Assumptions

- ☆ Transmission
 - Transmission limitations and reliability issues alter dispatch order
 - Transmission capacity limits resulted in three zonal market prices
 - Pricing based on postage stamp rates adopted by FERC in *Pro Forma* tariffs
 - No transmission owner is able to capture differences in zonal prices through transmission pricing.
- ☆ Market Price and Bidding Behavior
 - Centrally dispatched power pool
 - Pool determines dispatch order based on generator bid prices
 - Except in the market power cases, all generators are assumed to bid the variable generation costs.
 - Market clearing price = bid price of the last unit dispatched to meet load.
- ☆ Market Power
 - To assess whether any generator could exercise market power, several scenarios were run to assess impacts of strategic bidding behavior.
- ☆ Consumer Behavior
 - The model does not consider demand responsiveness to price

Status Quo Case

☆ Objective

- Estimate the benefits from competitive wholesale markets
- Estimate generations sales, revenues and total costs for the three generating utilities before any cost savings due to changes in market structure are modeled

Total Sales, NPV Costs and Revenues for Study Period, Status Quo Case

Utility	Sales (MWh)	Total Costs (\$Millions)	Generator Revenues (\$ Millions)
MLP	26,946,946	276	302
CEA	71,492,787.2	782	911
GVEA	14,537,990	301	255
Total	112,977,724	1,359	1,468

Pooled Dispatch Case

☆ Objective

- To estimate the cost savings from employing a pool dispatch in the Railbelt.
- To benchmark model to the BVI results

☆ Major Assumptions

- Transmission limits were increased to allow more efficient dispatching (duplicates BVI analysis)

Total Sales, NPV Costs & Revenues for Study Period, Pooled Dispatch Scenario

Utility	Sales (MWh)	Total Costs (\$Millions)	Generator Revenues (\$ Millions)
MLP	30,741,791	320	377
CEA	75,729,252	835	964
GVEA	6,506,680	163	90
Total	112,977,724	1,318	1,431

Pooled Dispatch Case (cont'd)

Change from Status Quo Scenario

	Increase in Sales between 1996 and 2017		Increase in Costs (\$M)	
	MWh	%	\$Millions	%
MLP	3,794,845	14%	\$ 44.26	16%
CEA	4,236,465	6%	\$ 53.17	7%
GVEA	(8,031,310)	-55%	\$(138.36)	-46%
Total	0		\$ (40.94)	

Pooled Dispatch Case (cont'd)

Comparison of BVI and CH2MHILL Study Results (Net Present Value \$000's)

	BVI Costs (BVI Table ES-1)	Costs w/o Capital	Costs w/ Capital for New GVEA Plants
Individual	1,433	1,359	1,421
Pooled	1,403	1,318	1,380
Savings from Pooled Dispatch	30	41	41
Percentage Savings	2.09%		2.89%

Fuel Costs Case

☆ Objectives

- To isolate the impact of differences in natural gas fuel contracts on the wholesale market

☆ Assumptions

- Fuel costs for all natural gas plants were set equal to the cost for the CEA Beluga 1-8 plants

Fuel Cost Equalization Case

	Increase in Sales between 1996 and 2017		Increase in Costs (\$M)		Increase in Generator Revenue		Increase in Profit
	MWh	%	\$Millions	%	\$ Millions	%	\$ Millions
MLP	59,555	0.2%	-32.1	-11.2%	-37.8	-11.2%	-5.7
CEA	-42,983	-0.1%	-9.4	-1.1%	-11.3	-1.2%	-1.8
GVEA	-16,572	-0.3%	-0.2	-0.1%	-0.2	-0.2%	0.0
Total	0		-41.7		-49.2		-7.5

Market Power Cases

☆ Objective

- To test the impacts of increased bid prices and reduced bid quantities on market price

☆ Cases

- CEA's bid price is 20% over its marginal costs
- CEA's bid price is 20% over its marginal costs, and MLP is assigned 35 MW of transmission capacity
- CEA's bid price is 20% over its marginal costs, and MLP is assigned all 70 MW of transmission capacity
- CEA's bid price is 40% over its marginal costs
- CEA's bid price is 40% over its marginal costs, and MLP is assigned 35 MW of transmission capacity
- CEA's bid price is 40% over its marginal costs, and MLP is assigned all 70 MW of transmission capacity.
- CEA withholds Beluga 3 capacity
- CEA withholds Beluga 6-8 capacity

Market Power Cases (cont'd)

CEA Bids 20% Over Marginal Cost, Contract Transmission Capacity

	Increase in Sales between 1996 and 2017		Increase in Costs (\$M)		Increase in Generator Revenue		Increase in Profit
	MWh	%	\$Millions	%	\$ Millions	%	\$ Millions
MLP	51,759	0.2%	0.9	0.3%	5.2	1.4%	4.4
CEA	-4,788,948	-6.8%	-47.6	-6.0%	109.4	10.2%	157.0
GVEA	4,737,189	42.1%	53.2	24.7%	57.6	38.9%	4.3
Total	0		6.4		172.2		165.8

CEA Bids 20% Over Marginal Costs, 35 MW Transmission Capacity for MLP

	Increase in Sales between 1996 and 2017		Increase in Costs (\$M)		Increase in Generator Revenue		Increase in Profit
	MWh	%	\$Millions	%	\$ Millions	%	\$ Millions
MLP	2,922,646	8.7%	36.2	10.2%	62.5	14.2%	26.3
CEA	-7,252,587	-10.6%	-80.2	-10.6%	60.8	5.9%	141.0
GVEA	4,329,941	40.0%	48.9	23.1%	53.0	36.9%	4.2
Total	0		4.9		176.3		171.4

Market Power Cases (cont'd)

CEA Bids 20% Over Marginal Costs, 70 MW Transmission Capacity for MLP

	Increase in Sales between 1996 and 2017		Increase in Costs (\$M)		Increase in Generator Revenue		Increase in Profit
	MWh	%	\$Millions	%	\$ Millions	%	\$ Millions
MLP	14,823,013	32.5%	190.6	37.3%	245.4	39.5%	54.9
CEA	-16,268,111	-27.4%	-197.2	-30.9%	-125.3	-14.9%	71.8
GVEA	1,445,098	18.2%	8.8	5.1%	-1.5	-1.7%	-10.4
Total	0		2.2		118.6		116.3

CEA bids 40% over Marginal Cost

	Increase in Sales between 1996 and 2017		Increase in Costs (\$M)		Increase in Generator Revenue		Increase in Profit
	MWh	%	\$Millions	%	\$ Millions	%	\$ Millions
MLP	59,555	0.2%	1.0	0.3%	12.0	3.1%	11.0
CEA	-6,719,276	-9.7%	-64.0	-8.3%	251.3	20.7%	315.2
GVEA	6,659,721	50.6%	73.1	31.0%	80.7	47.1%	7.5
Total	0		10.1		343.9		333.8

Market Power Cases (cont'd)

CEA bids 40% above Marginal Cost, and MLP Transmission Capacity increases to 35MW

	Increase in Sales between 1996 and 2017		Increase in Costs (\$M)		Increase in Generator Revenue		Increase in Profit
	MWh	%	\$Millions	%	\$ Millions	%	\$ Millions
MLP	2,950,355	8.8%	36.7	10.3%	74.1	16.5%	37.4
CEA	-9,454,754	-14.3%	-98.8	-13.4%	193.7	16.7%	292.5
GVEA	6,504,399	50.0%	71.2	30.4%	78.3	46.4%	7.1
Total	0		9.1		346.1		337.0

CEA bids 40% above Marginal Cost, and MLP owns 70MW Transmission Capacity

	Increase in Sales between 1996 and 2017		Increase in Costs (\$M)		Increase in Generator Revenue		Increase in Profit
	MWh	%	\$Millions	%	\$ Millions	%	\$ Millions
MLP	9,653,370	23.9%	123.6	27.9%	209.6	35.8%	86.0
CEA	-14,255,834	-23.2%	-165.7	-24.7%	83.3	8.0%	249.0
GVEA	4,602,464	41.4%	51.6	24.1%	55.9	38.2%	4.3
Total	0		9.5		348.8		339.3

Market Power Cases (cont'd)

CEA Withholds Beluga 3

	Increase in Sales between 1996 and 2017		Increase in Costs (\$M)		Increase in Generator Revenue		Increase in Profit
	MWh	%	\$Millions	%	\$ Millions	%	\$ Millions
MLP	0	0.0%	0.0	0.0%	0.2	0.0%	0.2
CEA	-269,975	-0.4%	-1.3	-0.2%	24.3	2.5%	25.5
GVEA	269,975	4.0%	2.6	1.6%	2.6	2.8%	0.1
Total	0		1.3		27.1		25.8

CEA Withholds Beluga 7-8

	Increase in Sales between 1996 and 2017		Increase in Costs (\$M)		Increase in Generator Revenue		Increase in Profit
	MWh	%	\$Millions	%	\$ Millions	%	\$ Millions
MLP	304	0.0%	0.0	0.0%	0.3	0.1%	0.3
CEA	-541,484	-0.7%	43.8	5.0%	39.0	3.9%	-4.9
GVEA	541,180	7.7%	5.2	3.1%	5.5	5.8%	0.3
Total	0		49.0		44.8		-4.3

CEA Withholds Beluga 6-8

	Increase in Sales between 1996 and 2017		Increase in Costs (\$M)		Increase in Generator Revenue		Increase in Profit
	MWh	%	\$Millions	%	\$ Millions	%	\$ Millions
MLP	304	0.0%	0.0	0.0%	0.3	0.1%	0.3
CEA	-541,484	-0.7%	47.3	5.4%	39.0	3.9%	-8.4
GVEA	541,180	7.7%	5.2	3.1%	5.5	5.8%	0.3
Total	0		52.6		44.8		-7.8

Canceling Generation Additions

☆ Objective

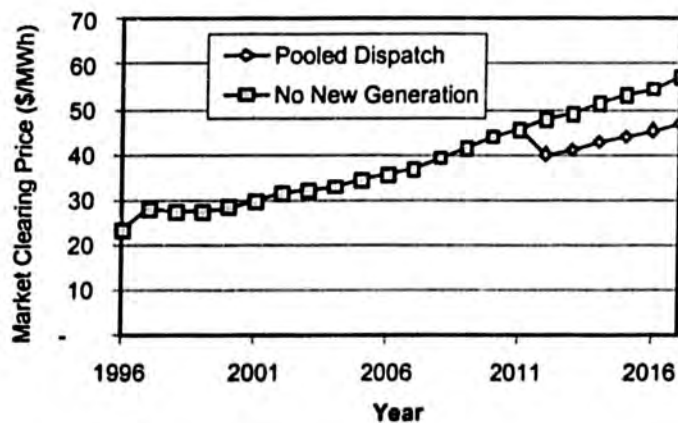
- Estimate the impacts of not building the only generator addition included in the BVI base case

No New Generation Capacity Added

	Increase in Sales between 1996 and 2017		Increase in Costs (\$M)		Increase in Generator Revenue		Increase in Profit
	MWh	%	\$Millions	%	\$ Millions	%	\$ Millions
MLP	0	0.0%	0.0	0.0%	1.9	0.5%	1.9
CEA	28,914	0.0%	0.3	0.0%	6.0	0.6%	5.7
GVEA	-28,914	-0.4%	-42.6	-35.5%	5.3	5.5%	47.8
Total	0		-42.3		13.2		55.5

Canceling Generation Additions (cont'd)

Impact on Market Prices of Canceling Generation Additions



New Market Entrant Case

☆ Objective

- To examine the impact of an independent power producer (IPP) on the costs and revenues of the three Railbelt utilities

☆ Assumptions

- 100 MW of new generation in the GVEA service territory in the year 2002
- Cost and operating characteristics of a GE 7EA gas-fired combined cycle unit

New Market Entrant Case (cont'd)

New Entrant in the Status Quo Case

	Sales by Company (MWh)			Total NPV Costs (\$M's)			Total NPV Revenues (\$M's)		
	Base Case Resources	Add GE 7EA CC in 2002	Difference	Base Case Resource \$	Add GE 7EA CC in 2002	Difference	Base Case Resource \$	Add GE 7EA CC in 2002	Difference
MLP	26,946,946	30,793,550	3,846,604	275.5	320.6	45.1	301.7	378.0	76.3
CEA	71,492,787	60,770,096	(10,722,691)	782.1	672.0	(110.1)	911.4	904.0	(7.3)
GVEA	14,537,960	7,398,078	(7,139,882)	300.9	171.3	(129.6)	254.6	98.8	(155.8)
IPP	-	14,016,000	14,016,000	-	120.6	120.6	-	159.8	159.8
Total	112,977,724	112,977,724	(0)	1,358.6	1,264.5	(74.0)	1,467.7	1,540.7	72.9

New Entrant in the Pooled Dispatch Base Case

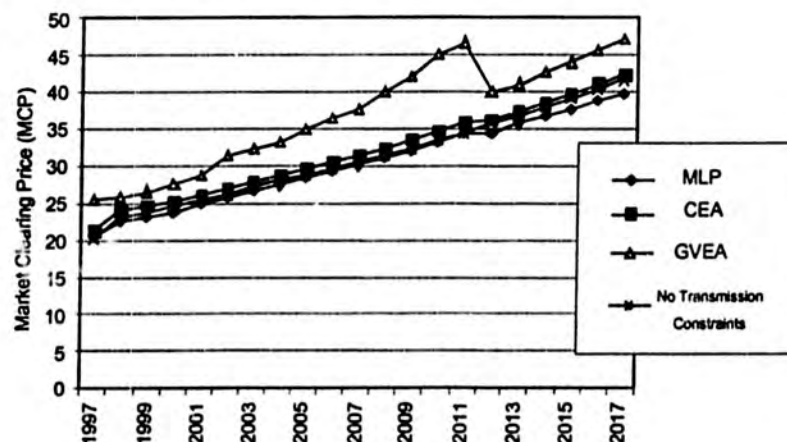
	Sales by Company (MWh)			Total NPV Costs (\$000's)			Total NPV Revenues (\$000's)		
	Base Case Resources	Add GE 7EA CC in 2002	Difference	Base Case Resource \$	Add GE 7EA CC in 2002	Difference	Base Case Resource \$	Add GE 7EA CC in 2002	Difference
MLP	30,741,791	29,745,134	(996,656)	319.8	308.9	(10.9)	378.5	350.3	(28.2)
CEA	75,729,252	66,200,801	(9,528,452)	835.3	730.5	(104.8)	964.0	826.8	(137.2)
GVEA	6,506,680	3,015,790	(3,490,891)	162.6	120.0	(42.6)	90.5	36.7	(53.8)
IPP	-	14,016,000	14,016,000	-	120.6	120.6	-	111.8	111.8
Total	112,977,724	112,977,724	-	1,317.8	1,280.0	(37.8)	1,431.1	1,325.7	(105.4)

Transmission Constraint Cases

- ☆ Objective
 - To examine the value of increased transmission capacity
- ☆ Assumptions
 - Remove all transmission constraints in the Railbelt

Transmission Constraint Cases (cont'd)

Annual Market Clearing Price with No Transmission Constraints



Transmission Constraint Cases (cont'd)

No Transmission Capacity Constraint

	Increase in Sales between 1996 and 2017		Increase in Costs (\$M)		Increase in Generator Revenue		Increase in Profit
	MWh	%	\$Millions	%	\$ Millions	%	\$ Millions
MLP	4,561,801	12.9%	45.9	12.6%	38.5	9.3%	-7.4
CEA	-898,542	-1.2%	-5.8	-0.7%	-32.4	-3.5%	-26.5
GVEA	-3,663,260	-128.8%	-50.6	-45.2%	-77.7	-606.4%	-27.1
Total	0		-10.5		-71.6		-61.1

MLP Receives 35 MW of Transmission Capacity

	Increase in Sales between 1996 and 2017		Increase in Costs (\$M)		Increase in Generator Revenue		Increase in Profit
	MWh	%	\$Millions	%	\$ Millions	%	\$ Millions
MLP	2,868,609	8.5%	35.3	9.9%	53.9	12.5%	18.6
CEA	-2,870,399	-3.9%	-36.5	-4.6%	-48.3	-5.3%	-11.8
GVEA	1,790	0.0%	0.2	0.1%	0.2	0.2%	0.0
Total	0		-1.0		5.8		6.8

Load Growth Cases

☆ Objective

- To assess the impact that varying load growth forecasts have on utility costs and revenues

Load Growth Forecast Increased by 2%

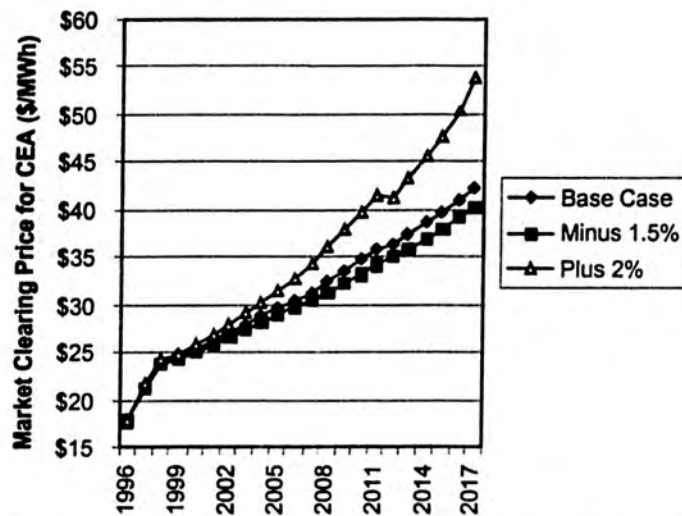
	Increase in Sales between 1996 and 2017		Increase in Costs (\$M)		Increase in Generator Revenue		Increase in Profit
	MWh	%	\$Millions	%	\$ Millions	%	\$ Millions
MLP	7,542,987	19.7%	79.8	20.0%	118.5	23.9%	38.7
CEA	16,710,445	18.1%	188.9	18.4%	290.6	23.2%	101.7
GVEA	7,542,842	53.7%	97.1	37.4%	120.2	57.0%	23.1
Total	31,796,274		365.7		529.3		163.5

Load Growth Forecast Decreased by 1.5%

	Increase in Sales between 1996 and 2017		Increase in Costs (\$M)		Increase in Generator Revenue		Increase in Profit
	MWh	%	\$Millions	%	\$ Millions	%	\$ Millions
MLP	-4,448,137	-16.9%	-44.1	-16.0%	-66.8	-21.6%	-22.7
CEA	-11,416,719	-17.8%	-121.9	-17.1%	-146.4	-17.9%	-24.5
GVEA	-2,751,412	-73.3%	-33.7	-26.2%	-44.0	-94.4%	-10.2
Total	-18,616,268		-199.7		-257.1		-57.5

Load Growth Cases (cont'd)

Annual MCP for CEA under Alternate Growth Forecasts



Stranded Costs

- ☆ Stranded costs are defined as the reduction in generator revenues due to the introduction of competition into the Railbelt
- ☆ Stranded cost = $NPV(\text{Net Generator Revenue}[R,y]) - NPV(\text{Net Generation Revenue}[C,y])$

Stranded Cost Estimates

Stranded Costs by Scenario (\$Millions)

Scenario		Increase in NPV Revenue	Increase in NPV Costs	Stranded Cost
Table 5	Base Case	(\$414)	(\$41)	\$373
Table 6	Fuel Cost Equalization	(\$463)	(\$83)	\$380
Table 7	Fuel Cost Equalization with Increases MLP Transmission	(\$459)	(\$88)	\$371
Table 8	CEA Bids 20% over Marginal Cost, Contract Transmission Capacity	(\$242)	(\$35)	\$207
Table 9	CEA Bids 20% Over Marginal Costs, 35 MW Transmission Capacity for MLP	(\$238)	(\$36)	\$202
Table 10	CEA Bids 20% Over Marginal Costs, 70 MW Transmission Capacity for MLP	(\$295)	(\$39)	\$257
Table 11	CEA Fossil Fleet bids 40% over Marginal Cost	(\$70)	(\$31)	\$39
Table 12	CEA Fleet bids 40% above Marginal Cost, and MLP T Capacity 35MW	(\$68)	(\$32)	\$36
Table 13	CEA Fleet bids 40% above Marginal Cost, and MLP owns 70MW T Capacity	(\$65)	(\$31)	\$34
Table 14	Withholding of Beluga 3 by CEA	(\$387)	(\$40)	\$347
Table 15	Withholding of Beluga 7-8 by CEA	(\$369)	\$6	\$377
Table 16	Withholding of Beluga 6-8	(\$369)	\$12	\$381
Table 17	No New Generation Capacity Added	(\$401)	(\$83)	\$317
Table 23	No Transmission Capacity Constraint	(\$485)	(\$51)	\$434
Table 24	MLP Receives 35 MW of Transmission Capacity	(\$408)	(\$42)	\$366
Table 25	Load Growth Forecast Increased by 2%	\$115	\$325	\$209
Table 26	Load Growth Forecast Decreased by 1.5%	(\$671)	(\$241)	\$430
Table 18	New Entrant in the Status Quo Case	(\$501)	(\$195)	\$306
Table 19	New Entrant in the Pooled Dispatch Base Case	(\$631)	(\$158)	\$473
Table 20	New Entrant when the CEA Fleet Bids 40% above Dispatch Cost	(\$648)	(\$161)	\$486
Table 21	Impact of CEA Bidding 40% above Dispatch Cost (with IPP in 2002)	(\$304)	\$158	\$146
Table 22	Impact of IPP on CEA's Withdrawal of Beluga Unit 3	(\$609)	(\$158)	\$451

Restructuring in Alaska

☆ Restructuring?

Alaska can undertake restructuring - meaning a fundamental change in the structure and operation of the electric utility system in the Railbelt.

☆ Competition?

It is not clear that the result would be robust competition.

Elements of Competition

- | | |
|------------------------------|-------------------------------------|
| ☆ Number of Suppliers. | ☆ Price Discovery Mechanism. |
| ☆ Number of Buyers. | ☆ Pricing Information. |
| ☆ System Reliability. | ☆ Settlements and Billing. |
| ☆ Non-Discriminatory Access. | ☆ Market Monitoring and Compliance. |
| ☆ Transmission Governance. | ☆ Ease of Entry. |
| ☆ Market Clearing Mechanism. | ☆ Ease of Exit. |

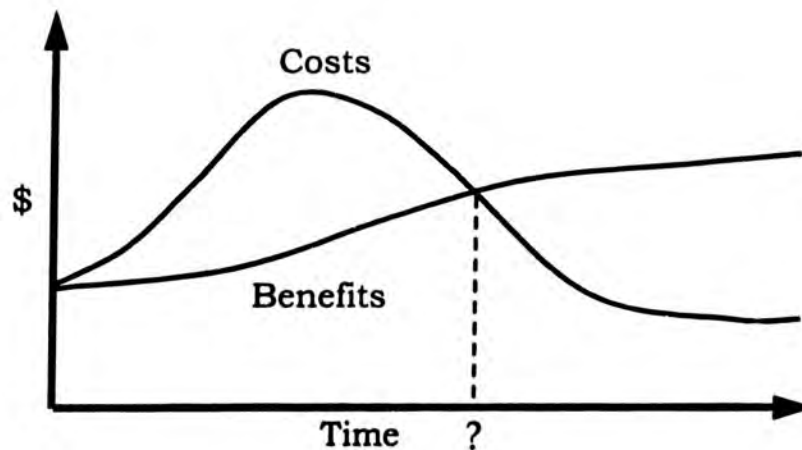
Restructuring Benefits

- ☆ Administration
 - Reduced regulation
 - Specialized institutions
 - Reduced transactions costs
- ☆ Social
 - Consumer choice
 - New products and services
 - Convergence benefits
 - Targeted program funding
 - Internalization of costs
- ☆ Industry
 - Market discipline
 - Price signals -- marginal cost pricing
- ☆ Rough estimate of range of benefits --
 - Decrease in generator costs from NPV \$40 to \$75 million through 2017
 - Decrease in customer costs from NPV \$35 to \$50 million through 2017

Restructuring Costs

- ☆ Administration
 - New institutions
 - New regulations and oversight responsibilities
- ☆ Social
 - Consumer education
 - Cost shifting to large customers with many choices to smaller customers
 - Discrimination
 - Stranded benefits
- ☆ Industry
 - Stranded costs
 - Market power
 - Employees
- ☆ Rough estimate of range of benefits --
 - New institutions and oversight requirements: \$25 to \$250 million
 - Unchecked exercise of market power could cost customers as much as \$50 million
 - Estimates of stranded costs vary widely from \$35 million to several hundred million dollars.

Timing of Benefits and Costs



Restructuring in Alaska: Time for Action?

- ☆ Preparing for competition? Yes
 - Bush
 - Virtual aggregation
 - Technology pilots
 - PCE reform
 - Railbelt
 - Complete a limited regulatory reform agenda
 - Maximize potential for market success
- ☆ Implementing competition? Not yet
 - Experience in other states is too new and limited to "problem states"
 - Experience from other states that have restructured is not directly applicable to Alaska
 - Invention is required

Recommendations

- ☆ Continue and expand efforts to improve rural system efficiencies through aggregation of administrative, fuel-purchasing, operations, logistical and other appropriate functions among geographically separate but proximate villages.
- ☆ In order to build practical experience in the use and deployment of distributed energy systems which offer potential long-term cost savings, consider the creation of a pilot program based on technology demonstration and deployment, conducted in coordination with government and non-governmental organizations.
- ☆ Initiate a specific set of market-friendly regulatory reforms today in order to bring the real competitive opportunity into focus.

Recommendations (cont'd)

☆ Complete a regulatory agenda that -

- (a) calculates and allocates component costs for Railbelt utilities in a rational and uniform manner (unbundling and cost allocation);
- (b) rationalizes access to, and governance of, the transmission system to create a non-discriminatory open access network while ensuring reliability;
- (c) rationalizes oversight of generation siting and construction to minimize stranded cost exposure and to foster the emergence of a competitive wholesale market with new merchant generators; and
- (d) implements central dispatch/power pooling recommendations of the October 1998 Black & Veatch study in the Railbelt to harvest near-term savings and to facilitate emergence of a competitive wholesale market over the longer term.

Recommendations (cont'd)

☆ Maximize potential for market success -

- (a) Mitigate regulatory and structural inefficiencies to produce near-term savings and encourage efficient market behavior.
- (b) Design pilot and retail competition to encourage technology-based competition and to realize the potential for technological innovation to reduce costs.
- (c) Design efficient commodity markets to enable value-added service innovation.
- (d) Exploit Alaska's small electricity systems to lead the industry trend toward new, modular distributed energy systems.
- (e) Harmonize restructuring agendas in telecommunications, natural gas, and electricity to realize convergence benefits.

Recommendations (cont'd)

- ☆ Any market, regardless of size and scope, must carry its own administrative and oversight costs.
- ☆ To increase market liquidity, consider contract-based competition in small increments of energy, e.g., 500 kWh contracts.
- ☆ To increase market liquidity, consider a BTU Exchange, e.g., create a market exchange where both gas and electricity are traded as BTU contract.
- ☆ Consider retail market simulation modeling as part of the decision to move to a full retail competition pilot or retail competition.
- ☆ Full retail market opening must be preceded by modeling and simulation in any case.

Benefit Estimates

- ☆ Benefit and cost estimates equal the differences between the competitive scenarios and current regulated rates.
- ☆ Each scenario is designed to isolate a single independent variable. The results cannot be summed.
- ☆ The dynamic interaction of unit dispatch and changes in market clearing prices can produce results that are difficult to interpret and compare across multiple scenarios.
- ☆ The magnitude of potential savings suggests that more open and competitive markets can provide substantial benefits to electricity customers in the Railbelt.

Scenario	Generator Savings (\$ Million)	Customer Benefits (\$ Million)	Potential Stranded Costs (\$ Million)
Status Quo with Wholesale Competition	\$ 0	\$ 414	\$ 414
Pooled Dispatch	\$ 41	\$ 45*	\$ 373
Fuel Cost Equalization	\$ 83	\$ 462	\$ 380
CEA Bids 20% Over Marginal Cost, Contract Transmission Capacity	\$ 35	\$ 242	\$ 207
CEA Bids 40% Over Marginal Cost, Contract Transmission Capacity	\$ 31	\$ 70	\$ 39
No New Generation Additions	\$ 83	\$ 401	\$ 317
IPP in Pooled Dispatch	\$ 158	\$ 631	\$ 473
No Transmission Constraints	\$ 51	\$ 485	\$ 434

Benefits - Policy Implications

Issue	Implication	Policy Focus
Differences in zonal market clearing prices are the result of differences in generator costs and transmission constraints.	Many of the benefits from competition come from displacing more expensive GVEA generation with less costly resources.	Focus on solutions that remove north/south transmission constraints and encourage merchant plant development.
Concentration of generating resources in the Railbelt.	The modeling analysis demonstrates that most of the consumer benefits from competition could be compromised by the exercise of market power.	Regulatory and public policy initiatives to mitigate market power are essential to realize benefits.
Differences in generation costs between CEA & ML&P.	The modeling analysis suggests that the differences – and competitive positions – can largely be explained from differences in fuel prices (more than in generation operational characteristics).	Focus on restructuring initiatives that provide opportunities to rationalize fuel cost differences. Consider recovery for above-market fuel contracts.