

**Juneau's Spring 2008
Hydroelectric
Shortage:
Business Impact Survey**

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Introduction

The Juneau Economic Development Council is interested in understanding how dramatic fluctuations in electricity prices affect local businesses, both financially and from a business behavior perspective. In August of 2008, the Juneau Economic Development Council conducted a survey of Juneau businesses to determine the impacts experienced by Juneau businesses when the town lost access to hydropower during the avalanche event in April of 2008. The telephone survey included a random sampling of 92 private local businesses—nine percent of all private Juneau businesses. The survey included 30 questions related to electricity usage and finances.

Background

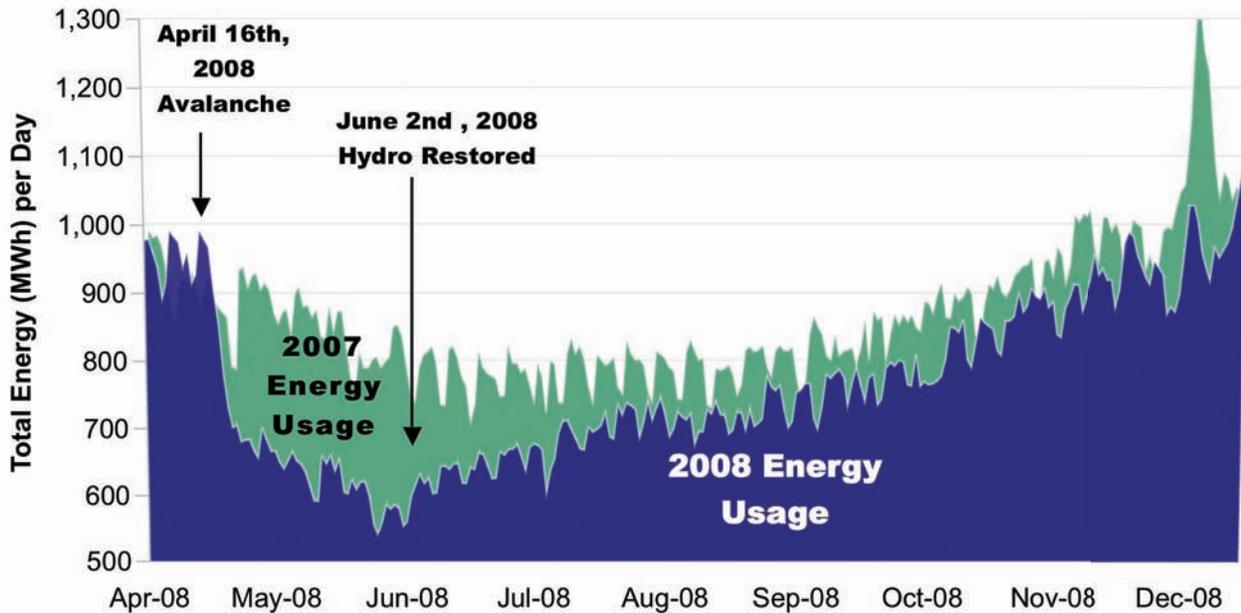
The families, business, and governments located in Juneau, Alaska have long been accustomed to energy derived from inexpensive hydroelectric power. Decisions made regarding energy use and conservation have therefore historically been linked to the concept that Juneau's energy is clean, plentiful and cheap. The Snettisham Hydroelectric Project, which provides approximately 85 percent of Juneau's power, began providing power to Juneau in 1973, and despite some initial challenges along the 44-mile transmission line, Snettisham service experienced few interruptions between 1976 and 2008. However, two significant interruptions over a recent nine-month period—April 2008 through January 2009—changed how Juneau businesses and residents use and think about electricity, at least in the short-term.

Spring 2008

On April 16, 2008 a series of avalanches damaged or destroyed several transmission towers and more than a mile of transmission line between Snettisham and the city of Juneau. Initial thoughts were that the repair process could take up to three months, and that Juneau's electricity rate of just under ten cents per kilowatt hour would increase five-fold throughout that period as costly diesel-generated power replaced the standard hydropower. As a result, Juneau's residents and many local businesses aggressively pursued ways to conserve energy. Energy consumption in Juneau reduced from nearly 1,000 megawatt-hours (MWh) per day before the avalanche to a low of 540 MWh as the hydropower outage progressed, a 45 percent decrease.

Fortunately, the Snettisham transmission line repairs were completed just six weeks later, on the 2nd of June. Businesses and residents paid a single high monthly bill, at 52 cents per kilowatt-hour. Although the crisis was averted, the community continued to conserve, albeit less dramatically, throughout the remainder of 2008, as depicted in the chart below. In fact, the total energy consumed in 2008 after the community was reconnected with hydropower, was 11 percent lower than over the same period in the previous year.

Total Daily Energy Use in Juneau 2007 Versus 2008



Source: AEL&P. Note – Greens Creek and cruise ship energy use are not included in the above chart.

January 2009

Generally there was an expectation that such an event was unlikely to occur again. However, on January 12th, 2009 an avalanche once again destroyed a tower along Snettisham, knocking out low cost power to the Capital City. This time, the crisis appeared to be less severe. For one thing, the price of diesel had dropped from \$4.17 a gallon during the first hydroelectric shortage in April of 2008, to \$2.25 a gallon, meaning that the price per kilowatt hour for consumers would rise to an estimated level of 25 cents per kilowatt-hour, less than half of the per kilowatt fee associated with the Spring 2008 event. Secondly, the repair period was predicted to be much shorter. Still, energy usage fell 22 percent from the day prior to the avalanche to the following week.

The survey was conducted prior to the January 2009 event, and thus only captured the reaction by businesses to the Spring 2008 hydroelectric shortage.

While the Juneau Economic Development Council assumes responsibility for the content in this report, JEDC would like to thank the University of Alaska Southeast for collaboration on this project.

Energy Conservation Utilized

The survey asked Juneau businesses about the level of energy conservation they employed prior to, during and following the 2008 hydroelectric shortage. Prior to the 2008 hydroelectric shortage, 41 percent of Juneau businesses practiced some level of energy conservation. During the hydroelectric shortage that percentage increased to 93 percent. By August of 2008, three months after hydroelectric power was restored, 78 percent of Juneau businesses continued to practice energy conservation on some level.

Conservation Prior to the 2008 Hydroelectric Shortage

Two-fifths (41 percent) of Juneau businesses used energy conservation measures prior to the avalanche of April 2008.

Did your Business Take Any Energy Conservation Measures Before the April 2008 Hydroelectric Shortage

Response	Percent
Yes	41%
No	55%
Refused/Don't Know	3%

Open Responses: What type of measure or measures were undertaken? (Prior to avalanche)

- ▷ Reduced use of lights.
- ▷ Purchased and used energy saving lights.
- ▷ Turned heat down.
- ▷ Turned hot water down.

Conservation During the 2008 Hydroelectric Shortage

Nearly all (93 percent) of Juneau businesses conserved energy during period that Juneau was without hydropower in the Spring of 2008.

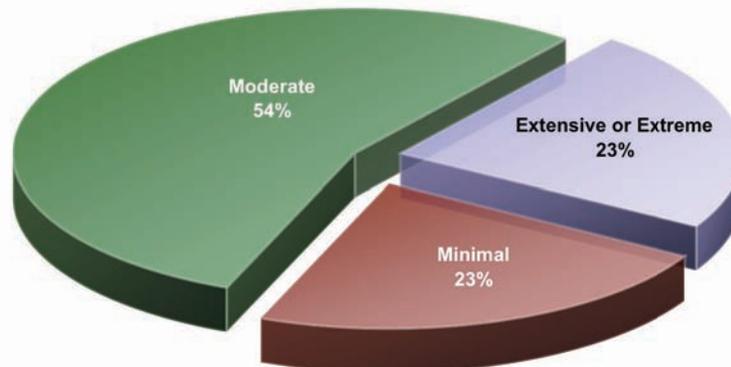
Did your Business Take Any Energy Conservation Measures During the April 2008 Hydroelectric Shortage

Response	Percent
Yes	93%
No	7%
Refused/Don't Know	0%

Just over half (54 percent) of the businesses that did conserve rated themselves as “moderate” energy conservers (defined as utilizing two conservation methods) during hydro-electric shortage,

while the remaining businesses were equally divided among more minimal and more extensive or extreme measures.

Conservation Measures During Electricity Crisis



What types of measures were undertaken?

- Nine out of ten (91 percent) of Juneau businesses turned off their lights during their regular business hours.
- Three-quarters (74 percent) of Juneau companies turned off computers to reduce energy consumption during the April 2008 hydroelectric power outage.
- Two-thirds (66 percent) of Juneau businesses turned off other pieces of electrical equipment.
- More than half of Juneau businesses (57 percent) switched to compact florescent light bulbs.
- Most businesses (97 percent) maintained normal working hours during the April 2008 hydroelectric shortage; however 8 percent reduced workers' hours to conserve during the hydroelectric shortage.
- Additional examples of conservation measures taken include the following:
 - ▷ Unplugged items when not in use
 - ▷ Disconnected freezers
 - ▷ Switched to new light bulbs
 - ▷ Turned off air conditioning
 - ▷ Used candles & oil lamps

Did the hydroelectric power outage cause you to change behavior in your business?

Approximately two-thirds of Juneau businesses (61 percent) changed their business behavior in response to the electricity crisis, including the following changes:

- ▷ Made signs to remind employees and customers to turn off lights.
- ▷ Became more vigilant about powering down computer and other electronics.
- ▷ Continued to make sure that lights were turned off.
- ▷ Reduced dryer usage.
- ▷ Became more conscious of lights.
- ▷ Learned how to work without lights
- ▷ Unplugged coffee pots when not in use.
- ▷ Discussed energy use with employees.
- ▷ Generally became a lot more conscious regarding electricity waste.
- ▷ Reduced use of air conditioning.
- ▷ Generally reduced electricity consumption.

Conservation Following Restoration of Hydroelectric Power

Did your Business Continue to Employ Energy Conservation Measures After the Hydroelectric Power Was Restored?

Response	Percent
Yes	78%
No	15%
Refused/Don't Know	7%

In August 2008 when the survey was conducted 78 percent of Juneau businesses still employed electricity conservation savings measures, including the following:

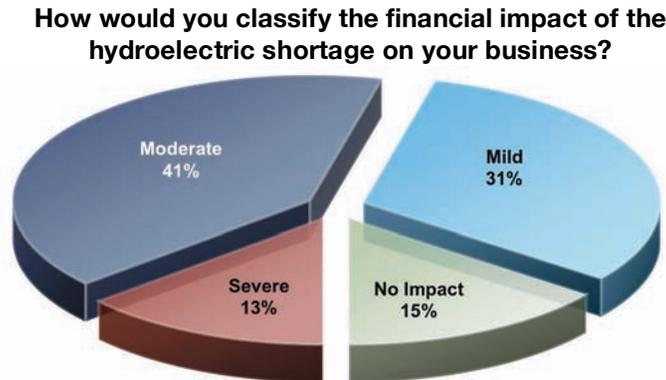
- ▷ Keeping up with good conservation habits.
- ▷ Using power strips.
- ▷ Have more general awareness.
- ▷ Only use washing machine for full loads.
- ▷ Unplug appliances when not in use.
- ▷ Generally more conscious of lights.
- ▷ Keep chargers unplugged when not in use.
- ▷ Keep lights off when not in use.

One-in-five (22 percent) of Juneau businesses invested in power saving technology for their business.

Over half of Juneau businesses (55 percent) said that the hydroelectric power outage helped them to find cost saving measures for their businesses.

Financial Impact

The Juneau Economic Development Council was especially concerned that financial strain caused by increased energy costs could be extremely detrimental to Juneau's businesses. While 85 percent of Juneau businesses did experience negative financial impacts due to the hydroelectric shortage of 2008, only 13 percent of businesses classified the impacts as "severe".



Did your sales increase, decrease or remain the same during the loss of hydroelectric power?

- Half of Juneau businesses (51 percent) reported that their sales during this period remained the same.
- One quarter (25 percent) reported that their sales decreased.
- Two percent of Juneau businesses reported an increase in sales.

For the 25 percent of businesses that did experience a loss in sales during the event how many months do you believe it will take your business to return to normal conditions?

- Nearly three-fifths (59 percent) said the recovery would take eight to nine months.
- A quarter (23 percent) said it would take three to six months.
- Eighteen percent of businesses reporting a sales decrease said it would take one month or less to recover.

Did your business seek alternative methods of payment for the May or June electric bill such as SBA loan, bank loan, credit card, leveled payment with AEL&P?

- Most (79 percent) of Juneau businesses did not seek alternative payment methods for their electricity bill.
- Seven percent of Juneau businesses did seek alternative methods of payment.
- The remaining 15 percent of Juneau business did not respond to this question.

Gasoline, Diesel and Heating Oil Costs

Has the recent increase in the cost of gasoline or diesel caused you to raise your prices?

Half (51 percent) of Juneau businesses raised their prices due to the increase in fuel prices.

Has the recent increase in the cost of heating oil caused you to raise your prices?

Sixteen percent of Juneau businesses raised their prices due to the increase in heating oil.

Additional Survey Comments

Following the telephone survey, respondents were asked if they had any additional comments regarding the Spring 2008 hydropower shortage. The following comments were gathered by the survey team:

- ▷ There is no reason to beat up AEL&P, they fixed problems ASAP.
- ▷ The outage woke the community up in terms of conservation.
- ▷ We couldn't pass costs off to our customers. Businesses take profit and must take their share of the loss as well. AEL&P should hold this ethic as well.
- ▷ I was impressed by AEL&P.
- ▷ We didn't have the ability to significantly reduce electric consumption due to safety issues.
- ▷ I appreciated outage because we learned to conserve.
- ▷ We could go out of business due to increases in fuel prices.
- ▷ If we didn't have diesel I would have had to close my doors. Having diesel backup saved a lot of businesses.
- ▷ We've learned a lot, it was a valuable experience.
- ▷ Rent went up because of this and is probably not coming down. There's not much you can do.
- ▷ All small businesses are feeling the pinch the power outage.
- ▷ I didn't think we should get federal funding because there are bigger disasters out there than our loss of power.
- ▷ Our business was thankful for the Juneau Unplugged program.
- ▷ This was all much ado about very little.
- ▷ I hope AEL&P modernizes their diesel generators to make them more efficient.
- ▷ It was inconvenient but AEL&P can't be blamed for it amazing how they got things back on line so quickly.
- ▷ Our clients are more interested in conservative measures and sustainability.
- ▷ There is a greater awareness regarding energy issues.
- ▷ I was impressed by the speedy repair process and impressed with the way the town responded and carried forward conservation measures after the crisis over.
- ▷ AEL&P handled the situation well and got power back quickly.
- ▷ As a homeowner we changed behavior and that carries over to business.

Business Demographics

Respondents were asked to provide some details regarding their organizations.

How many months out of the year does your business operate?

Nearly all (97 percent) of the businesses surveyed operate 12 months of the year. Only one percent of businesses surveyed operated five months per year or less.

How many employees does the business have in total, including yourself?

Fifty-seven percent of businesses surveyed have ten employees or less. According to Alaska Department of Labor statistics, 73 percent of Juneau businesses have 10 or fewer employees.

Number of Employees	
Number of Employees	Percent
1 to 10	57%
11 to 20	17%
21 or more	21%
Refused/Don't Know	5%

How long have you been in business?

Eighty-six percent of the businesses surveyed have been in business more than 6 years.

Years in Businesses	
Number of Years	Percent
Less than 1	1%
1 to 3	6%
4 to 6	3%
More than 6	86%
Refused/Don't Know	4%

Would you classify the ownership of the business as female, male or joint ownership?

Ownership	
Gender	Percent
Male	26%
Female	10%
Joint	49%
Refused/Don't Know	16%

What is your average annual sales revenue?

Annual Sales Revenue	
Range	Percent
Below \$500,000	27%
\$500K to \$999K	23%
\$1 to \$4 million	37%
More than \$4 million	13%
Average	\$2.7 million

Note: Only 1/3rd of businesses responded to this question.