HOONAH INTERTIE EXTENSION –

ECONOMIC CONSIDERATIONS

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Table of Contents

Page

Introduction ……. 1

Executive Summary ……..... 2

Methodology ……..... 4

Estimates of Surplus Energy from Juneau Hydro Projects ……. 7

Hoonah Electric Load Forecast ……. 14

Costs and Characteristics of the Hoonah Intertie Extension ……. 18

Costs and Characteristics of the Hoonah Electrical System
If the Extension Is Not Built ……... 22

Economic Analysis and Conclusions ……. 27

Note on Small Hydroelectric Projects Recently Considered
To Serve Hoonah ……. 30

Attachment A: AEL&P Graph – Loads and Hydro Resources

Attachment B: Comment from City of Hoonah and IPEC

Attachment C: Comment from Former Chairman of Southeast Conference Energy Committee

Attachment D: Economic Analysis Spreadsheets

INTRODUCTION

Construction of an electrical transmission grid throughout southeast Alaska has been under consideration for many years. A number of studies have been conducted which consistently identified a transmission link between Juneau and the Greens Creek mine on Admiralty Island as being among the most cost-effective segments. At the present time, construction of that link is nearing completion. According to a July 2005 press release from Alaska Electric Light & Power (AEL&P, the Juneau electric utility) and Kennecott Greens Creek Mining Company, installation of the 9.5 mile submarine cable between Douglas Island and Admiralty Island was underway during summer 2005, and all elements of the project were scheduled for completion by early 2006. Further, a 15-year interruptible power sales agreement was signed by the two parties and has been approved by the Regulatory Commission of Alaska.

For at least the last several years, the Juneau – Greens Creek intertie has generally been conceived and presented as the first phase of a two-phase project, with the second phase consisting of an extension of the line from Greens Creek on Admiralty Island to Hoonah on Chichagof Island. This extension would include a 25 mile submarine cable between the two islands coupled with an additional 3.5 miles of overhead line to reach the Hoonah powerhouse.

The Denali Commission has been asked to commit federal grant funds to help fund the extension to Hoonah. In connection with that request, Denali Commission staff asked the Alaska Energy Authority (AEA) to conduct a brief review of the economic merits of the proposed extension. AEA, in turn, commissioned the analysis presented below.

Because of the very limited time budgeted for the work, nearly all of the data on which it rests is based on previously published material. The most recent and most extensive analysis that has been published about the project is the "Southeast Alaska Intertie Study" prepared by D. Hittle & Associates, Inc. for the Southeast Conference in December 2003. The D. Hittle report supplies most of the primary source material for this review.

A draft version of this report was completed in January 2006 and was made available to involved parties including AEL&P, Inside Passage Electric Cooperative (IPEC, the utility that serves Hoonah), the City of Hoonah, and the Southeast Conference. Comments on the draft were solicited and have been considered in the preparation of this final report.

EXECUTIVE SUMMARY

An electrical transmission line connecting the Juneau service area with the Greens Creek mine on Admiralty Island is now being completed. The Hoonah intertie extension would consist of 25 miles of submarine cable plus 3.5 miles of overhead line, and would connect the Hoonah service area with the existing Juneau – Greens Creek transmission system. The Alaska Energy Authority instructed that a capital cost estimate of $30 million for the Hoonah intertie extension be used for this brief review of the project economics.

The current population of Hoonah is approximately 850, and Hoonah's electrical requirements are presently served by diesel generators. The key issues in addressing the economic merits of a Hoonah intertie extension are whether sufficient hydroelectric surplus will exist in the Juneau area to export to Hoonah, and whether savings from substituting surplus hydro for diesel generation would outweigh the project costs.

In a 2003 study conducted for the Southeast Conference by D. Hittle & Associates, the energy requirements of the Juneau service area were projected to be 372.7 GWh[1] in the year 2012. The energy requirements at Greens Creek in 2012 were projected to be about 58.7 GWh, bringing the total energy requirement for the currently interconnected system to 431.4 GWh.

The average annual energy capability from existing hydro projects in the Juneau area is 353.0 GWh. Assuming the Dorothy Lake (phase 1) hydro project is completed before 2012, the average hydro capability at that time would increase to 428.0 GWh.

Based on these numbers and assuming average water conditions, no surplus hydro capability is projected for the years 2012 and beyond as long as the Greens Creek mine is in operation. Hoonah's annual electric energy requirements are projected within a range of roughly 6.0 to 10.0 GWh. While this is small compared with the Juneau or Greens Creek loads, connecting Hoonah to the existing grid would not allow additional energy from existing and planned hydro projects to be used nor would it reduce the amount of diesel generation required within the interconnected system unless the Greens Creek mine shuts down.

There are alternative scenarios with respect to Juneau's future loads as well as the ultimate mine life of Greens Creek that create a range of hydro surplus possibilities. For nearly all of the scenarios tested in this report, the amount,

[1] 372.7 GWh (gigawatt hours) is equal to 372,700 MWh (megawatt hours). Energy is typically expressed in MWh in subsequent sections of this report.

duration, and value of such hydro surplus is insufficient to compensate for the projected capital and operating costs of the Hoonah intertie extension.

In addition to alternative hydro surplus scenarios, this review tested the effect of differing forecasts of diesel fuel prices as well as electrical loads in Hoonah. With respect to future diesel fuel prices, a constant price of $1.85 per gallon (expressed in 2005 dollars) from 2011 forward constituted the higher scenario, based on the most recent long term outlook by the U.S. Department of Energy. A constant, real price of $1.25 per gallon from 2011 forward constituted the lower scenario based on the most recent forecast from the Alaska Department of Revenue. As discussed in the body of this report, a favorable benefit - cost ratio was calculated only when all of the most favorable assumptions on hydro surplus availability, fuel price, and Hoonah load were factored in.

Finally, at AEA's request, brief mention is made at the end of this report of two potential hydroelectric projects in the Hoonah area that were studied by a firm on contract to the City of Hoonah in 2002. According to the cited report, a $3.75 million project at Gartina Falls could generate 1.9 GWh per year on average, and a $3.1 million project at Water Supply Creek could generate 1.8 GWh per year. Neither the cited report nor its conclusions were evaluated in any way during the course of this review.

METHODOLOGY

In reviewing the basic economic merits of a project, all costs that are incurred as a result of the project, and all savings that are realized from it, are entered into the analysis regardless of who pays for the costs or benefits from the savings. By contrast, a financial analysis might ignore certain capital costs if they are paid by grants from external sources, and might include certain charges incurred by project participants even if those charges do not represent actual increases in the cost of system operations. AEA has instructed that this analysis focus on the basic economic merits of the project. As a result:

1. There will be no incremental cost associated with the production of electrical energy from surplus hydroelectric resources. Specifically, if Dorothy Lake (phase 1) is constructed and surplus energy is available from it to export to Hoonah after supplying the energy requirements of the AEL&P service area and the Greens Creek mine, no additional cost would be incurred either to generate that additional hydro energy for Hoonah nor to transmit that energy as far as Hawk Inlet on Admiralty Island. All of the generation and transmission costs to accomplish that are fixed and would have been paid in any event.

   This is in contrast to the methodology used in the D. Hittle report, which assumed a "cost" (actually a purchase price) of 8.5 cents per kWh for additional energy supplied by AEL&P and transmitted to Hoonah.

2. The capital cost of the intertie extension will be entered in full as a cost of the intertie extension, regardless of how much may be funded by grants from one source or another. This is also in contrast to the methodology used in the D. Hittle report which, for project evaluation purposes, assumed a zero capital cost for the intertie based on the assumption that it would be funded entirely by grants. Particularly since this analysis is being conducted at the request of the Denali Commission in their consideration of a federal grant request, it would not make sense from that perspective to assume that such funding is "free."

Presently, all of Hoonah's electrical requirements are met with local diesel generators. The economic merit of the intertie extension depends on the availability of surplus hydroelectricity that would go unused if the intertie extension is not built, but would be used to replace Hoonah's diesel generation if the intertie extension is built.

This fundamental issue may be easiest to visualize by conceiving all three load centers (Juneau, Greens Creek, and Hoonah), and all existing and proposed generation and transmission serving these load centers, as a single system

served by a single electric utility. Assume that this utility owns and operates all the hydro projects in the Juneau area, all the diesel generators located in Juneau, in Greens Creek, and in Hoonah, as well as the transmission system that now connects Juneau and Greens Creek.

The first question for this hypothetical utility would be whether extending the transmission system to Hoonah would allow it to reduce costs by replacing diesel generation in Hoonah with hydroelectric energy that otherwise would not be used. If the intertie extension would allow such replacement to occur, the second question would be how the savings in diesel generating costs compare with the costs of building and maintaining the intertie extension.

If all of the energy that can be generated from the utility's hydro plants is already consumed within the existing Juneau – Greens Creek interconnected grid, then nothing will be gained by extending the transmission system to Hoonah.[2] If the intertie extension were built anyway, any reduction of diesel generation in Hoonah would have to be made up by a corresponding increase in diesel generation either in Juneau or in Greens Creek, negating any savings that would justify the project cost.

AEL&P has noted that its interruptible power sales agreement with the operator of the Greens Creek mine provides that Hoonah will have priority over Greens Creek to any hydroelectricity that is surplus to Juneau's own requirements, provided of course that an intertie extension to Hoonah is built. This provision, however, has no effect on the fundamental economics of the intertie extension. For illustration, consider the following rough example:

1. Assume that 50,000 MWh per year of hydroelectric energy is surplus to Juneau's own requirements.

2. Assume that the annual demand for electricity at Greens Creek is 50,000 MWh and that, at the time of this example, all of that requirement is being met with surplus hydro from Juneau.

3. Assume that the annual demand for electricity in Hoonah is 10,000 MWh, and that the proposed intertie extension to Hoonah is built.

4. The expected result would be the following:

[2] As noted later, there may be other benefits to building a connection to Hoonah – for example, by bundling an improved communication link along with the intertie extension. However, in the absence of any identified estimate of the net value of other benefits, they are assumed in this review to be insufficient to substantially change the project economics.

a. Juneau would continue to export its 50,000 MWh per year of surplus hydroelectricity just as before.

b. Hoonah would draw 10,000 MWh of that energy from the new intertie connection and would shut down its diesel generators.

c. Greens Creek would now find it necessary to generate 10,000 MWh from its own diesel generators to supplement the amount available from Juneau.

There could be no reduction in the amount of diesel generation in the interconnected system following construction of an intertie to Hoonah since, in this example, Juneau's hydroelectric potential was already fully used before the extension was built. The decline in Hoonah diesel generation was matched by the increase in Greens Creek diesel generation, and therefore no savings were realized in the overall cost of power for the interconnected system.

The methodology of the economic analysis that follows begins with an examination of the hydroelectric capability in Juneau in comparison with forecasted electricity demand in Juneau and at Greens Creek. This is necessary to determine whether, or to what extent, additional hydroelectric energy can be generated beyond the requirements of the currently interconnected system.

If it were concluded that no surplus hydro so defined is projected to be available, the analysis could stop at that point and the project economics would be judged unfavorably. It will be seen, however, that there are scenarios under which surplus hydro will be available, though most likely in limited amounts and for limited timeframes. The analysis will therefore continue in an effort to evaluate the diesel cost reduction that would occur and compare that with the capital and operating cost of the intertie extension.

ESTIMATES OF SURPLUS ENERGY FROM JUNEAU HYDRO PROJECTS

It appears from the numbers in the D. Hittle report that all of the Juneau area hydro surplus will be used within the currently interconnected system as long as the Greens Creek mine is in operation. The numbers that suggest this conclusion are shown below in Tables 1 and 2:

Table 1

AEL&P Hydroelectric Generating Resources
And Available Energy (MWh)[3]

	2003	2007	2012
Hydroelectric Resources			
AEL&P Hydro	59,000	59,000	59,000
Snettisham	294,000	294,000	294,000
Dorothy Lake	0	0	75,000
Total Resources	353,000	353,000	428,000
Energy Requirements			
Firm Sales	298,167	308,619	327,246
Non-firm Sales	22,568	24,657	24,657
Losses and Own Use	19,197	19,864	20,795
Total Energy Requirements	339,932	353,140	372,698
Net Hydro Energy Available	13,068	0	55,302

The meaning of these numbers is essentially as follows:

2003: Assuming average water conditions, 353,000 MWh of electric energy could be generated from existing, Juneau area hydro projects, net of transmission losses and station service.

[3] With one exception, the information in this table is reproduced from Table 6-8, page 6-11, Southeast Alaska Intertie Study, Phase 1 Final Report, D. Hittle & Associates, December 2003. The exception is the timing of Dorothy Lake completion. Although D. Hittle in 2003 projected that Dorothy Lake would be online by 2007, as of this writing project construction has not yet begun. Current expectation is that project bonds will be sold within the next several months, allowing construction to begin. It is assumed throughout this review that Dorothy Lake will be online in 2010.

Electric energy requirements in the Juneau area in that year totalled 339,932, including firm sales, non-firm sales that are contingent on availability of hydroelectric generation (including sales to "dual-fuel" customers and cruise ships), plus losses and other use by the utility.

The result is that 13,068 MWh of surplus hydroelectric energy would have been available for local use or export.

2007: Due to gradual growth in Juneau area electricity demand projected by AEL&P, total energy requirements in 2007 were estimated at 353,140 MWh, meaning that no surplus hydroelectricity would be available for export. Again, in this instance and throughout this report, the projected availability of hydro energy is based on average water conditions. Less hydroelectricity can be generated in relatively dry years and more can be generated in relatively wet years.

2012: The increase in hydroelectric energy is based on the assumption that Dorothy Lake (Phase 1) will be online by 2010 and that the project will, on average, be capable of generating 75,000 MWh per year. With the addition of Dorothy Lake (Phase 1), the total hydroelectric energy resource increases to 428,000 MWh per year.[4]

Energy requirements in the AEL&P service area are projected to increase gradually to 372,698 MWh in 2012. The net effect of the increase in hydro capability and in Juneau area load growth is an estimated surplus of 55,302 MWh of hydro energy available for export.

Now that an intertie has been built to Greens Creek, how much of the available energy from Juneau area hydroelectric projects will be consumed and how much of the projected surplus will remain for additional consumers? The D. Hittle report supplies the following summary and projection of energy requirements at Greens Creek:

Table 2

	2003	2007	2012
Greens Creek			
Energy Requirements (MWh)	55,188	58,692	58,692

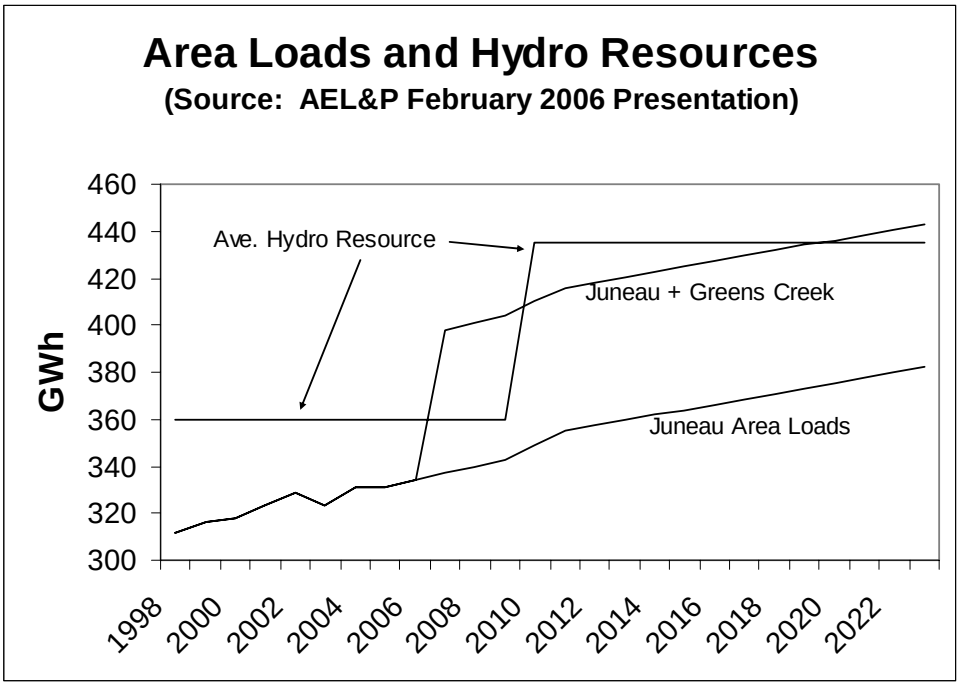
[4] Dorothy Lake (Phase 2) is not currently scheduled for construction although, if justified by load growth at some point in the future, it could provide an additional 94,000 MWh per year. This is a long term possibility but is well beyond current load expectations and does not appear within the current planning period.

According to these numbers, the hydro surplus available to export from Juneau in 2012 is projected to be 55,302 MWh after completion of Dorothy Lake (Phase 1). But the energy requirement at Greens Creek is estimated to be 58,692 MWh. This means that all hydro energy that can be generated by Juneau area projects will already be consumed within the interconnected Juneau – Greens Creek system, and that no additional hydro energy could be generated whether or not an intertie extension were built to Hoonah. Adding Hoonah to the grid will not result in reduced diesel generation within the interconnected system or in increased hydro energy usage as long as the Greens Creek mine is in operation.

This result could change under alternative forecasts of hydro energy capability and Juneau – Greens Creek demand. It is also subject to uncertain projections of the Greens Creek mine life. These two issues are considered below.

The bonds for Dorothy Lake are to be issued through the Conduit Revenue Bond Program of the Alaska Industrial Development and Export Authority (AIDEA). As a result, on February 24, 2006, AEL&P gave a presentation to the AIDEA Board of Directors that included information relevant to the Dorothy Lake financing, including a projection of area loads and hydroelectric capability. The graph presented by AEL&P with this information is shown in Attachment A. For ease of use in this report, a simplified version of the AEL&P graph has been prepared by Emerman Consulting and is shown in Figure 1 below:

Figure 1



The only significant difference between Figure 1 and Attachment A is that, in representing hydroelectric potential, the graph in Figure 1 shows only the amount that could be generated in an average water year and leaves out the additional lines in the AEL&P graph showing higher and lower output levels during relatively dry or wet years.

The differences between Figure 1 and the D. Hittle report are as follows:

1. The existing hydro resource in Figure 1 is a little higher: 360,000 MWh per year compared with 353,000 MWh in the D. Hittle report.

   Both sources assume 75,000 MWh for Dorothy Lake, so the "post-Dorothy" hydro resource in Figure 1 is 435,000 MWh vs. 428,000 MWh in the D. Hittle report.

   For this report, no explanation has been identified for the 7,000 MWh per year difference between the two.

2. The Juneau area load is lower in Figure 1 than in the D. Hittle report. For example, for the year 2003 the Juneau load is shown as approximately 323,000 MWh compared with approximately 340,000 MWh in the D. Hittle report. The AEL&P number is identified as "actual" although the D. Hittle number, appearing in a December 2003 report, should have been close to actual as well.

   This difference of approximately 17,000 MWh per year is carried forward in the load projections (i.e. the Figure 1 projection of Juneau load continues to be about 17,000 MWh per year below the D. Hittle projection).

3. As a result of these two discrepancies (the AEL&P graph showing higher hydro potential but lower Juneau load), the AEL&P graph shows a clear hydro surplus beyond the expected requirements of Greens Creek, although the surplus declines to zero over the 9-year period between 2010 and 2019. Reading from the graph, the amount of these hydro surpluses are estimated as follows:

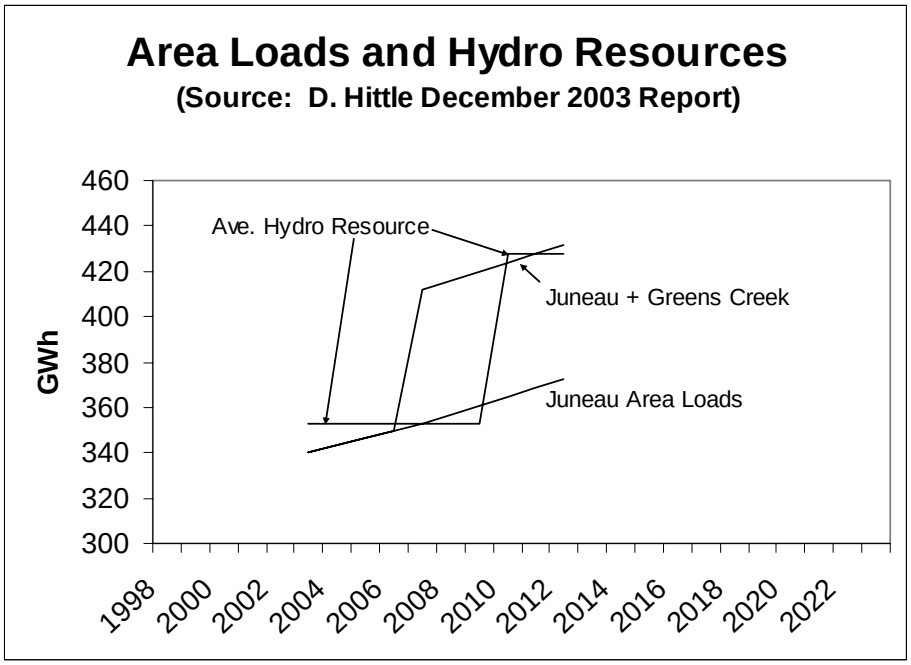
Table 3

Surplus Hydro (GWh) From AEL&P Graph

2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
25.0	19.0	16.8	14.5	12.3	10.0	7.8	5.5	3.3	1.0

For comparison, a graph has been prepared on the same scale displaying the numbers in the D. Hittle report, although the D. Hittle numbers are available for a shorter timeframe than those shown in the AEL&P graph. The graph based on the D. Hittle numbers is shown below in Figure 2:

Figure 2



There is no obvious reason to accept one of these sets of numbers over the other. It is unclear when the AEL&P graph was prepared since, as shown in Attachment A, the last year for which Juneau loads were labeled as "actual" is 2003. Also, it can be reasonably assumed that the numbers in the D. Hittle report were either provided to the consultants by AEL&P or approved by AEL&P. Still, we are left with two sets of numbers, one of which indicates that virtually no surplus hydro is projected to be available beyond the requirements of Juneau and Greens Creek, while the other indicates that a surplus will exist during the period 2010 – 2019.

One additional issue that is important for the economic analysis is suggested by the AEL&P graph, and that is the expected life of the Greens Creek mine. The AEL&P graph runs until 2023 and clearly assumes that Greens Creek will continue to be in operation at least until that time. It is possible that this projection is inadvertent but that seems unlikely since the Greens Creek load is a significant factor in the context of financing Dorothy Lake. It would certainly

make a noticeable difference in the graph if the Greens Creek load were projected to drop off sometime prior to 2023.

The eventual shut down date of the Greens Creek mine is an important issue in the context of the Hoonah intertie economics, since an earlier shut down date improves the project economics while a later shut down date worsens the economics. The analysis that follows will examine the impact of alternative assumptions on Greens Creek mine life.

Another factor that bears on the availability of surplus hydro is the length of time until the Juneau area load, without Greens Creek, grows enough to use all of the available hydroelectric energy itself, leaving none for export to anybody. In Figures 3 and 4 below, the AEL&P and D. Hittle load forecasts for the Juneau area are extended at a modest growth rate of 1.0% per year until the Juneau area load consumes all of the available hydro. For the extension of AEL&P projections shown in Figure 3, the hydro surplus in the absence of Greens Creek drops to zero in 2036. For the extension of D. Hittle projections shown in Figure 4, the hydro surplus in the absence of Greens Creek drops to zero in 2026.

Figure 3

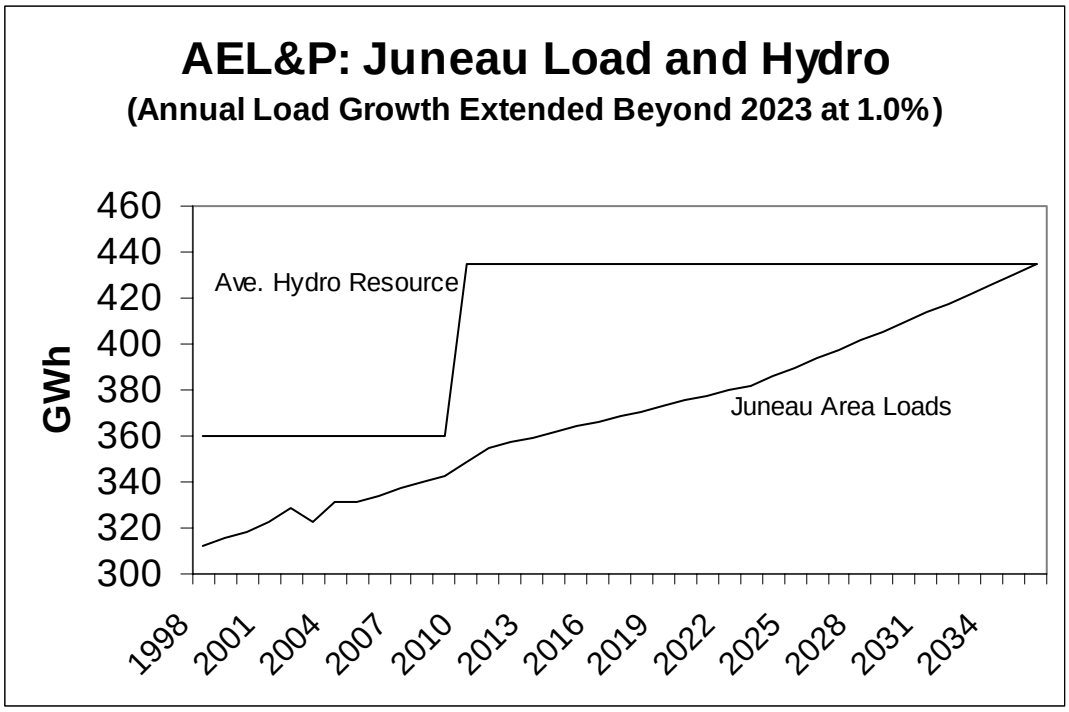
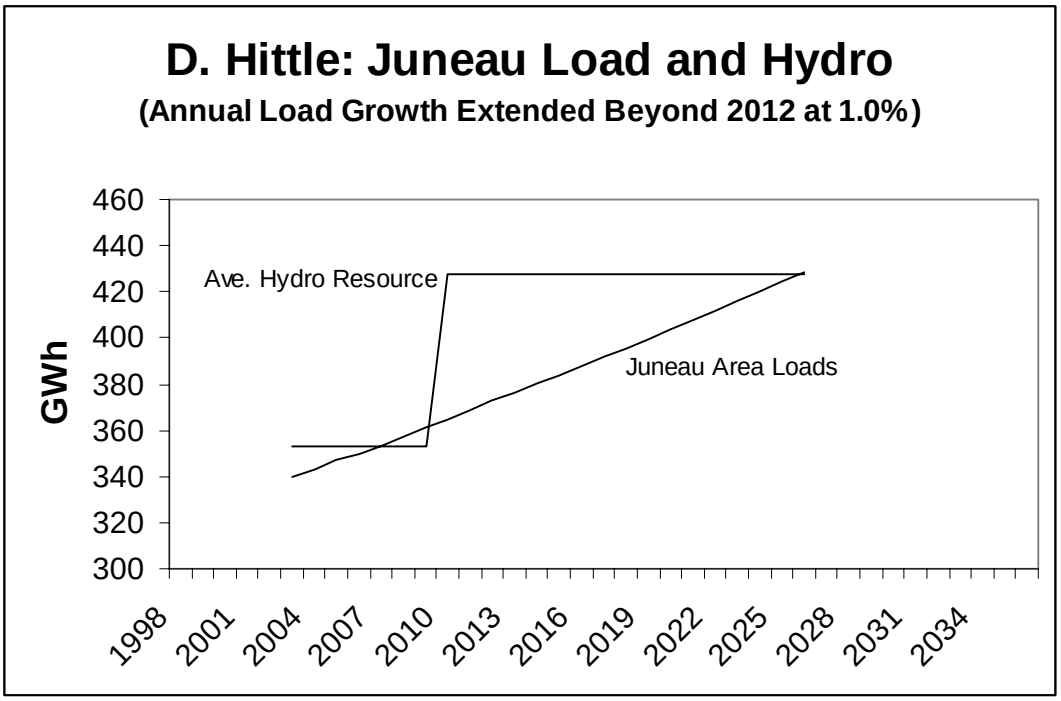


Figure 4



What this implies is that, regardless of the termination date of Greens Creek, it would be incautious to plan on the availability of hydro surpluses for export beyond 2026 or 2036, depending on which set of numbers are used.

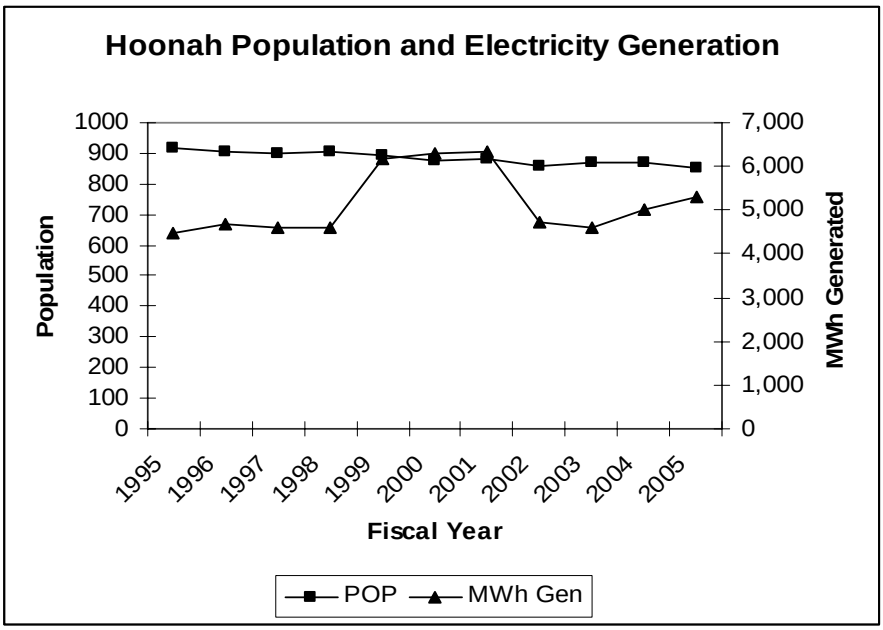
As stated above in the section on "Methodology," there are scenarios under which surplus hydro will be available, though most likely in limited amounts and for limited timeframes. The analysis will therefore continue in an effort to evaluate the diesel cost reduction that would occur under those scenarios and compare that with the capital and operating cost of the intertie extension.

HOONAH ELECTRIC LOAD FORECAST

Electricity is supplied to Hoonah consumers by the Inside Passage Electric Cooperative (IPEC), previously known as the Tlingit-Haida Regional Electrical Authority. Hoonah qualifies for monthly payments from the Power Cost Equalization (PCE) program to reduce the cost of power paid by residential customers and community facilities. According to present law, Hoonah will continue to be eligible for PCE whether or not the intertie extension is built or any alternatives to the intertie are built such as one or more local hydroelectric projects.

Figure 5 below shows the estimated population of Hoonah and the total amount of electricity generated for Hoonah during the last 10 fiscal years as reported to the PCE program:

Figure 5



Observations drawn from this data include the following:

1. According to the PCE reports, the Hoonah population has gradually declined over the last 10 years from 918 to 851, an average annual decline of less than 1% per year.

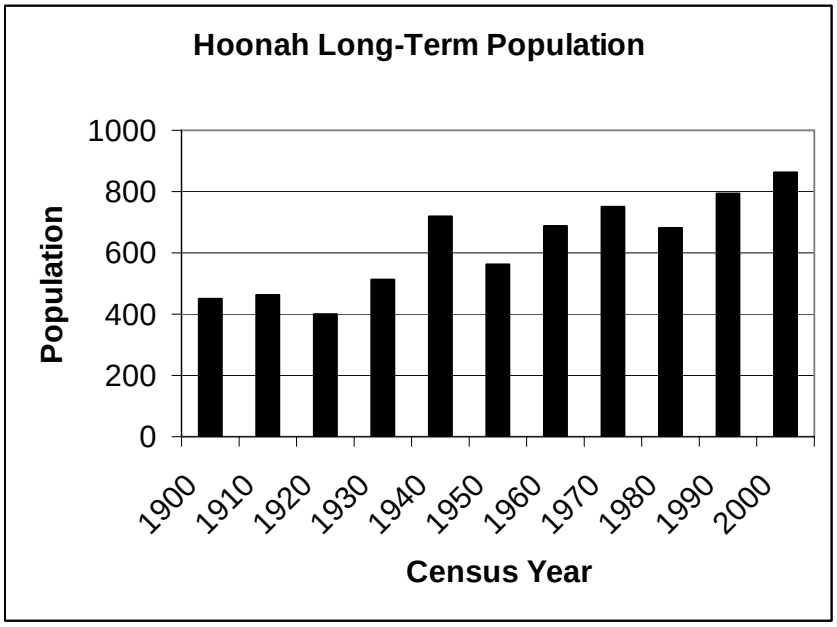
2. Electricity generation was essentially flat from FY 95 through FY 98. A sharp increase occurred in FY 99 due to service extended to the

Whitestone Logging Camp, which closed after several years. By FY 03, electricity generation returned to its previous FY 95 – 98 level. About two years ago, the IPEC electrical system was extended to a new tourist development at Point Sophia, which accounts for the observed increase in generation during FY 04 and FY 05. IPEC staff expects the Point Sophia load to grow somewhat more because the number of cruise ships will increase from 2 per week in summer 2005 to 5 per week in summer 2006.

Hoonah electrical generation was about 4,600 MWh per year without Whitestone Logging Camp or Point Sophia, but increased to 5,318 MWh by FY 05 evidently due to the Point Sophia development, an increase of about 700 MWh per year. A rough estimate at this point is that the expected growth at Point Sophia will further increase Hoonah's electrical generation requirement to about 6,000 MWh per year.

Figure 6 shows the long term population history for Hoonah, drawn from U.S. Census records for the last 100 years:

Figure 6



It is difficult to know how much weight to place on the long-term, 100 year trend vs. the shorter term, 10 year trend. The long term trend suggests that, despite some ups and downs, Hoonah's population has clearly shown a net increase whether the starting point is 1980, 1950, or 1900. This in itself suggests that, for purposes of long-term projections, gradual growth is a reasonable assumption regardless of specific developments like Point Sophia.

The initial Hoonah load scenario adopted for this review is that Hoonah generation requirements will be 6,000 MWh in 2006 and will increase at 1.0% per year thereafter. This differs significantly from the D. Hittle projection. A comparison of these two projections for selected years is shown below in Table 4:

Table 4

Hoonah Electrical Generation Requirements (MWh)

Year	Initial Scenario - This Review	D. Hittle Report
2002[5]	4,557	4,557
2006	6,000	7,807
2012	6,369	8,377

The main difference between these two projections appears to be the assumption on the size of electrical load at the Point Sophia development. The D. Hittle report assumes that the annual electrical load at Point Sophia will be 2,650 MWh, whereas this report assumes an annual load of about 1,400 MWh, bringing Hoonah's electrical generation requirement from 4,600 MWh per year to 6,000 MWh per year. The D. Hittle report further assumes that other Hoonah loads will increase at more than 1.0% per year based on somewhat higher growth assumptions in the number of customers and in the average electrical consumption per customer.

In their response to the draft of this report, IPEC and the City of Hoonah suggest that the load forecast should be still higher than the D. Hittle projections. They point out that the "initial scenario" forecast does not include commercial operators in Hoonah who presently generate their own power but who would buy power from the utility instead if the intertie were built and the price of utility power were reduced. Specifically, they state:

> "The commercial operators are the Icy Straits Lumber and Milling, which operates a sawmill and associated dry kiln, and Hoonah Cold Storage, a local seafood processor. The old Whitestone logging camp facility was also not included in the [draft] report due to the belief that it was to be shut down. In reality, it has been converted to a low income housing project with five families and a proposed halfway house facility. Hoonah Trading

[5] Historical figure from PCE Reports.

> Company, the local grocery, hardware and fuel distributor, will also join the local grid once the intertie is completed."

According to IPEC and the City, the Hoonah load in 2012 should be projected to be 9,819, and is compared to the other two estimates in Table 5 below:

Table 5

Hoonah Electrical Generation Requirements (MWh)

Year	Initial Scenario - This Review	D. Hittle Report	City of Hoonah and IPEC
2012	6,369	8,377	9,819

The impact of these higher load projections will be tested in the economic analysis below. The full narrative comment submitted by the City of Hoonah and IPEC is provided in Attachment B. The revised spreadsheets they also submitted are available from AEA.

COSTS AND CHARACTERISTICS OF THE HOONAH INTERTIE EXTENSION

Capital Cost

As noted in the introduction, the Hoonah intertie extension would include 25 miles of submarine cable from Hawk Inlet on Admiralty Island to Spasski Bay on Chichagof Island, plus 3.5 miles of overhead line from the submarine cable terminal to a new substation at the Hoonah powerhouse. Like the existing Juneau – Greens Creek segment, the Hoonah extension would be built at 69 kV. AEA has instructed that a capital cost estimate of $30.0 million for the Hoonah intertie extension be used for this review, based on an earlier estimate of $28.0 million adjusted for inflation.

The D. Hittle report does not provide a development schedule specifically for the Hoonah intertie extension but it does lay out what it calls an "example development schedule" for another proposed transmission link in southeast Alaska – specifically the proposed line between Petersburg and Kake. Assuming that project funding is in place, the D. Hittle report suggests that a four year time frame is reasonably achievable, with two years allocated to permitting, environmental studies, and preliminary engineering, and another two years allocated to final engineering, procurement, and construction. The report suggests that a comparable schedule would likely apply to the Juneau – Greens Creek – Hoonah project.

The assumption adopted for this review is that the $30 million cost of the Hoonah intertie extension would be spread over a four year period from 2007 through 2010, meaning that 2011 is assumed to be the first year of project operation. Although no guidance on the timing of project expenditures is provided in the D. Hittle report, this review assumes that 5% of the capital cost is expended in the first year, 10% in the second, 45% in the third, and 40% in the fourth.

Operations and Maintenance Cost

The estimated annual cost of operations and maintenance for the Hoonah line extension is again drawn from the D. Hittle report, which presents an O&M cost estimate for the complete, 2-phase intertie connecting Juneau with both Greens Creek and Hoonah. For this analysis, it is necessary to estimate how much these costs would be for Juneau – Greens Creek alone, and then how much incremental cost would be incurred if the line is extended to Hoonah. In making these allocations, the following characteristics of the two segments are considered:

1. The Juneau – Greens Creek segment includes 15 miles of overhead line (6 miles across Admiralty Island to Hawk Inlet plus 9 miles from Hawk Inlet to the mine site) while the Hoonah extension includes 3.5 miles of overhead line, or 19% of the total.

2. As noted above, the Juneau – Greens Creek segment includes 9.5 miles of submarine cable while the Hoonah extension includes 25 miles of submarine cable, or 72% of the total.

3. Also included for each segment are two submarine cable termination yards plus a new substation at Hoonah and a new substation at the minesite.

Based on these factors, the allocation of O&M cost for field work (inspections, tree trimming etc.) assumes:

1. Overhead line maintenance will be 19% Hoonah extension, 81% Juneau – Greens Creek.

2. The cost of submarine terminal inspections will be 50% Hoonah extension, 50% Juneau – Greens Creek.

3. Switchyard maintenance and miscellaneous costs will be split 50 – 50 between the two segments.

4. Unspecified “regular repairs / replacements” will also be split 50 – 50.

Annual administrative and general costs are estimated by D. Hittle assuming a single entity owns not only the complete Juneau – Greens Creek – Hoonah line but also the proposed Petersburg – Kake intertie. These costs include management, legal fees, insurance, accounting etc. Given the prior installation of the Juneau – Greens Creek segment, and removing any allocation for a Petersburg – Kake line, this analysis will assume that 20% of D. Hittle’s “A&G” estimate would be attributable solely to the Hoonah extension.

These assumptions and allocation factors are applied in the calculations below:

D. Hittle estimates $165,000 as the annual O&M cost for field work for the total Juneau – Greens Creek – Hoonah line. The following table shows the derivation of this figure and the allocations to the Hoonah extension that are assumed for this analysis:

Category	Total	Hoonah Allocation
Tree Trimming	$20,000	$3,800
Overhead line inspections	15,000	2,850
Regular repairs / replacements	50,000	25,000
Submarine Terminals / inspections	15,000	7,500
Switchyard maintenance	25,000	12,500
Miscellaneous	15,000	7,500
Contractor fee	25,000	12,500
TOTAL	$165,000	$71,650

D. Hittle estimates $190,000 as the annual administrative and general (A&G) cost for Juneau – Greens Creek – Hoonah plus Petersburg – Kake. For the Hoonah extension alone, the 20% allocation assumed for this analysis is $38,000 in incremental, annual A&G cost.

D. Hittle also adds an annual charge to a reserve fund to pay for major repairs to the intertie that can be expected somewhere down the line. The authors point out that a transmission line is generally not insurable and that an R&R fund is necessary to self-insure it. They also point out that the timing of major repairs or replacements to the line cannot be predicted although they are less likely to be needed in the early years of its operation. Representing this expected cost as an annual contribution to an R&R fund addresses the problem of unknown timing of major R&R costs.

D. Hittle estimates that an R&R fund of $2.5 million should be built up over time and retained for the Juneau – Greens Creek – Hoonah line, requiring annual contributions of $116,000. The $2.5 million reserve amount is based on the cost of a major submarine cable repair, and they indicate that, the longer the submarine cable, the larger the reserve that should be maintained.

In allocating a portion of this annual contribution to the Hoonah extension, two points seem most relevant:

1. D. Hittle's cost estimate for the complete, Juneau – Greens Creek – Hoonah intertie was $37.1 million. The estimate now in use for the Hoonah extension alone is $30 million. In other words, the current Hoonah extension cost is about 80% of the complete project cost estimated in 2003 by D. Hittle.

2. The submarine cable portion of the Hoonah extension represents 72% of the total submarine cable for the complete Juneau – Greens Creek – Hoonah project.

Based on these factors, this analysis assumes that 75% of the annual $116,000 R&R fund contribution should be allocated to the Hoonah extension, or $87,000.

The total annual O&M cost estimated for the Hoonah extension is therefore derived as follows:

Field Work	$71,650
Administrative and General	38,000
Repair and Replacement Fund	87,000
TOTAL	$196,650

COSTS AND CHARACTERISTICS OF THE HOONAH ELECTRICAL SYSTEM IF THE INTERTIE EXTENSION IS NOT BUILT

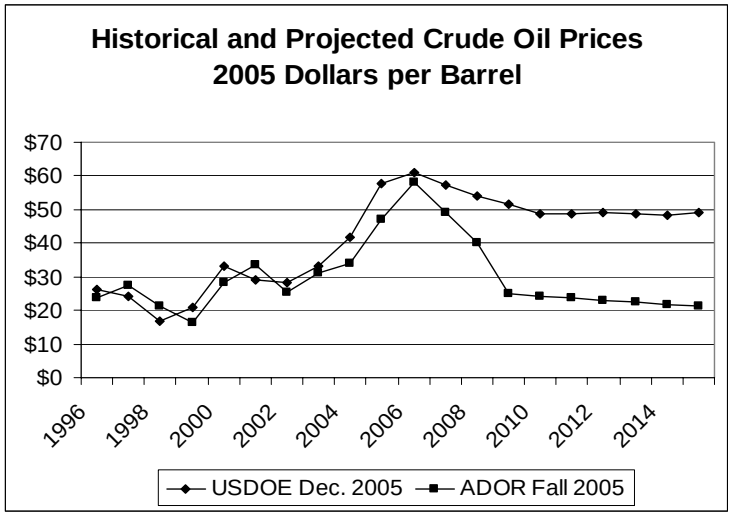
At the time of issuance of the D. Hittle report in December 2003, the Hoonah diesel powerhouse contained three generating units with a total generation capacity of 2,585 kW. Regarding the costs of capital replacement and expansion in the event the intertie extension is not built, AEA instructed that this review assume that a new diesel powerhouse would be built in Hoonah with new generating units, at an assumed total cost of $2.0 million.[6]

The D. Hittle report estimates $0.03 per kWh as the variable operations and maintenance cost for the Hoonah diesel powerplant. This includes "miscellaneous power generation expenses, generator overhaul and maintenance expenses, maintenance supervision and maintenance salaries." These costs are assumed to vary directly with the level of output from the diesel generators. For example, if the diesels generate 6,000 MWh per year, the variable O&M cost would be $180,000. However, if the diesels generate only 300 MWh per year (or 5% of 6,000 MWh), the variable O&M cost would be $9,000. This analysis adopts the D. Hittle assumption on diesel variable O&M cost, which can be avoided to the extent that imported electricity over the intertie extension replaces the need for on-site diesel generation.

The question of avoided fuel cost inevitably rests on forecasts of future diesel fuel prices. The most recent crude oil forecasts from the U.S. Department of Energy (USDOE) and from the Alaska Department of Revenue (ADOR) fairly represent the main alternative scenarios. USDOE sees a fundamental change in the long-term supply and demand economics for crude oil, with less growth in production capacity and greater growth in global demand than previously thought. ADOR sees a gradual reduction in prices through FY 2008, but in FY 2009 and beyond they project a return to the price environment that prevailed before the recent surge. These two price scenarios are shown in Figure 7 below:

[6] If the Hoonah intertie extension is built, IPEC will still need to maintain a fully operational diesel powerhouse to carry the load during planned or forced outages of the intertie or of the Juneau area generating system. Consequently, AEA instructed that this analysis assume that one diesel generator will require replacement even if the intertie is built, at a cost of approximately $500,000.

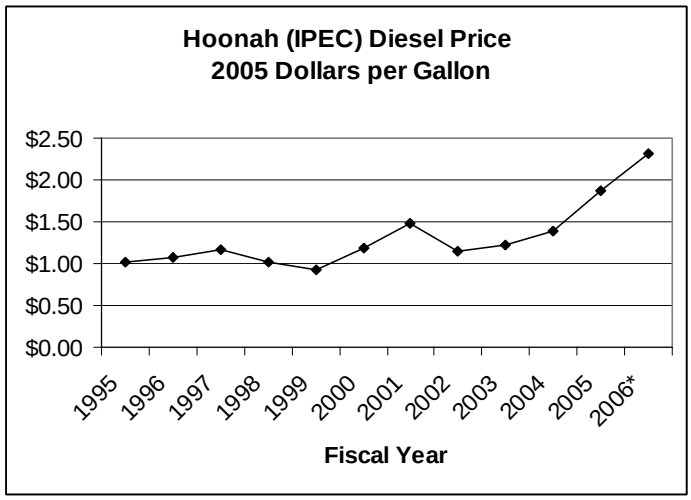
Figure 7



Note that these prices are expressed in constant, 2005 dollars per barrel. Also, the historical prices for the two series do not exactly match because (1) the USDOE series is tied to calendar years while ADOR uses fiscal years, and (2) the USDOE series is tied to the price of "imported crude oil" while the ADOR series shows the price of West Texas Intermediate.[7]

The recent history of diesel fuel prices delivered to the electric utility in Hoonah is shown in Figure 8 below:

Figure 8



[7] The USDOE forecast is found in the 2006 Annual Energy Outlook (Early Release), prepared by the Energy Information Administration within USDOE. The ADOR forecast is found in the Fall 2005 Revenue Sources Book published by the Alaska Department of Revenue, Appendices B-2A and B-2B, pages 94-95.

Note that the average for FY 2006 represents just the first half of the year (July through December 2005). Also, the average annual cost per gallon of fuel from PCE reports has been converted to 2005 dollars by application of the U.S. Consumer Price Index.

In the USDOE scenario, the price of crude oil is projected to drop from a high of about $61 per barrel in 2006 to about $49 by 2011, a decline of 20%, with roughly constant real prices thereafter. The average cost per gallon of diesel fuel in Hoonah during the first half of FY 2006 was $2.31 (in 2005 dollars). If the Hoonah diesel price were to decline 20% by 2011, the price at that time would be $1.85 per gallon. This is virtually identical to the average cost of diesel fuel in Hoonah during FY 2005.

Based on these calculations, the diesel price to the Hoonah electric utility under the USDOE scenario will be assumed to decline to $1.85 in 2011 and remain constant at $1.85 for the remainder of the analysis period. This will constitute one of the two fuel price scenarios to be used in the present analysis.

In the ADOR scenario, the price of crude oil is projected to drop from a high of about $58 per barrel in FY 2006 to roughly $23.50 in 2011 (again in 2005 dollars). This is a decline of 59%. If the Hoonah diesel price were to decline 59% by 2011, the price at that time would be $0.95 per gallon. This seems unreasonably low in the context of Hoonah diesel prices over the last 10 years. For this review, a “modified ADOR” scenario will be used in which the Hoonah diesel price declines to $1.25 per gallon (in 2005 dollars) in 2011 and remains constant at $1.25 for the remainder of the analysis period. $1.25 is virtually identical to the average cost of diesel fuel in Hoonah during FY 2003.

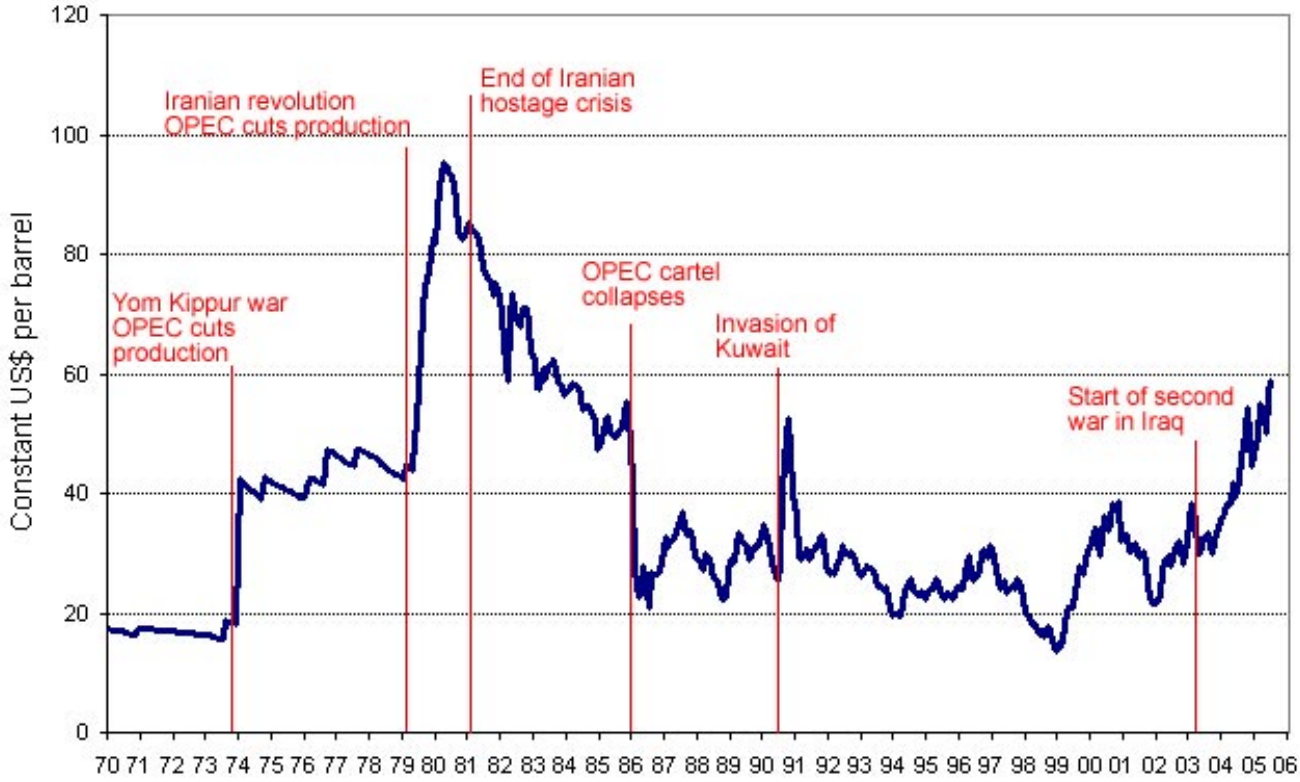
In response to the draft report, IPEC and the City of Hoonah suggest that the fuel price should be set at $2.22 per gallon for all scenarios and remain at that level in real terms throughout the analysis period. They state that $2.22 represents their average price in 2005 rather than $1.85 as stated above. Because prices have been rising, this discrepancy might be explained by the fact that $1.85 represents their reported average price during Fiscal Year 2005 while $2.22 may be the average price during Calendar Year 2005. In any event, setting the long-term price at $1.85 is based on the USDOE expectation that crude oil prices will drop over the long term by about 20%, meaning that the price of refined products would also decline and stabilize below the current peak.

It is certainly true that real oil prices could remain at today’s level and climb further over the long term, and there are many who believe this will occur. Perhaps this time they will be right, but this is not the first time that oil prices have increased sharply and have led to widespread predictions of continuing high prices based largely on a belief that oil demand is inelastic and oil supply has reached it peak. In previous episodes, oil demand has been shown to be inelastic in the short run but quite elastic over a term of several years. And

historically, pronouncements that the world is running short of oil have been premature. The predictions that prices will remain high or grow further have repeatedly been wrong. Again, this does not mean that such predictions will always be wrong but it does suggest caution in extrapolating the latest price spike over the long term. Figure 9 below is offerred as a reminder of this historical price volatility:

Figure 9

Crude Oil Prices (West Texas Intermediate)
Constant 2005 Dollars
January 1970 to July 2005



Source: Federal Reserve Bank of St. Louis; Bureau of Labor Statistics

As for the Fall 2005 oil price forecast from the Alaska Department of Revenue, a March 7, 2006 press release from ADOR states that their revised forecast for FY2009 and beyond has now declined (in nominal dollars) to $25.50 per barrel, compared with $27.50 in their Fall 2005 forecast. Clearly, ADOR is unwilling to make any bets at this point that oil prices will remain at today's relatively high level for the long term.

Finally, in calculating the avoided cost of fuel, the efficiency of the Hoonah diesel generators must be specified. In the D. Hittle report, a diesel efficiency factor of 14.5 kWh generated per gallon was assumed. According to PCE reports for FY 2005, the actual diesel efficiency achieved by IPEC in Hoonah was 14.7 kWh generated per gallon. If the Hoonah intertie extension is not built, this analysis assumes that a new diesel powerplant will be built in Hoonah at a cost of $2.0 million, and will include new and more efficient diesel generators. Therefore, for this analysis, it will be assumed that Hoonah would achieve a diesel efficiency of 15.0 kWh generated per gallon throughout the analysis period.

ECONOMIC ANALYSIS AND CONCLUSIONS

An excel spreadsheet has been constructed to calculate the present value of estimated system costs with and without the proposed intertie extension to Hoonah. Costs that are common to both scenarios – for example, the costs of diesel generation in Hoonah prior to the completion of an intertie – are excluded for the sake of simplicity, as such costs would cancel each other out and would not change the results of the analysis.

The projection period for the analysis must be established and there are several factors to consider:

1. The economic analysis period has been identified for several previous transmission line studies conducted for AEA:

   a. Lake Tyee to Swan Lake Transmission Line, June 1992.
   30 years

   b. Copper Valley Intertie, April 1994.
   50 years

   c. Railbelt Intertie Study, June 1989.
   35 years

   The three different analysis periods for the three studies does not establish a useful precedent to apply to the present case – only a range of between 30 and 50 years. One thing that all three studies have in common, however: In each case, factors such as loads and fuel prices were allowed to vary over the first 20 years and then all factors were held constant for the remainder of the analysis period. The purpose of this approach is to recognize the growing uncertainty of any projection the further out you go (by allowing projections to vary for no more than 20 years), while still capturing the long-term value of durable projects that are expected to function for more than 20 years.

2. The City of Hoonah and IPEC suggest in their comments that a 50-year project life should be assumed. In support, they provide a recent letter from a submarine cable manufacturer stating that such cables can serve for 50 years or longer. The manufacturer also states that “proper cable system design, manufacturing, and installation are vital elements for the longevity of a cable system especially in demanding environmental conditions.”

3. Regardless of the considerations noted above, the analysis can extend only as long as surplus hydro from Juneau is expected to be available. As

discussed earlier, extrapolating Juneau area loads alone (that is, without Greens Creek) at a modest annual growth rate of 1.0% results in elimination of the hydro surplus by 2026 (using the D. Hittle numbers) or 2036 (using the AEL&P presentation numbers).

The projected end of the hydro surplus will determine the end point of the economic analysis. A sensitivity case will be examined that assumes the hydro surplus will be available for a number of years beyond 2036.

All costs are expressed in constant, 2005 dollars. Consistent with recent studies conducted by or for AEA, the present value calculations are based on a real discount rate of 3.0%. Printouts of the excel spreadsheets are provided in Attachment D. The economic results are shown on the spreadsheets in two ways:

1. The present value of system costs of the diesel scenario are compared with the present value of system costs of the intertie extension scenario.

2. The present value of avoided diesel costs (i.e. those diesel costs that would be avoided if the intertie were built) are compared with the present value of intertie extension capital and O&M costs. These two numbers correspond to the benefits of the project and the costs of the project, and allow a benefit / cost (B/C) ratio to be calculated.

The following chart summarizes the results of the economic analysis. For each scenario, the chart shows the major assumptions that were adopted and the resulting B/C ratio.

	Scenario A	**Scenario B**	**Scenario C**	**Scenario D**	**Scenario E**
Juneau Area Loads, Greens Creek Load, and Ave. Hydro Resource taken from:	AEL&P Presentation	AEL&P Presentation	AEL&P Presentation	AEL&P Presentation	D. Hittle
Last year of analysis period (when Juneau loads assumed to use all hydro resource):	2036	2036	2036	2046	2026
Greens Creek mine -- final year of mine operations:	2023	2023	2015	2015	2015
Hoonah generation requirements taken from:	IPEC / City (9.8 GWh in 2011)	IPEC / City (9.8 GWh in 2011)	IPEC / City (9.8 GWh in 2011)	IPEC / City (9.8 GWh in 2011)	D. Hittle
Diesel price scenario from 2011 forward (EIA = $1.85 ; ADOR = $1.25)	EIA	ADOR	EIA	EIA	EIA
B/C Ratio	**0.67**	**0.50**	**0.88**	**1.08**	**0.37**

What these results show is that the costs of the Hoonah intertie extension outweigh the economic benefits in nearly all of the scenarios that are based on factors examined in this review. In order to push the B/C ratio a little over 1.0 in Scenario D, it was necessary to adopt all of the following assumptions:

1. The more favorable near term projection of Juneau – Greens Creek loads and average hydro resources taken from the February 2006 AEL&P presentation. In contrast to the outlook presented in the D. Hittle report, this makes a significant though diminishing hydro surplus available from 2010 to 2019.

2. Although the Greens Creek mine operates at least through 2023 in that same AEL&P presentation, it is assumed in Scenario D that Greens Creek operates only through 2015 and then shuts down permanently.

3. Although extrapolating from the AEL&P presentation indicates that Juneau area loads alone will use up all of the available hydro energy by 2036, it is assumed in Scenario D that a sufficient surplus to serve all of Hoonah's requirements continues to be available for another 10 years (i.e. through 2046).

4. The highest Hoonah load scenario is assumed (i.e. the load forecast proposed by IPEC and the City of Hoonah, which is higher than the D. Hittle forecast). Further, in contrast to AEA's standard practice in previous studies, a 1% annual growth rate in the Hoonah load was extended not just for 20 years but all the way out to 2046.

5. The higher of the two fuel price scenarios was assumed, meaning that the intertie economics further depend on real fuel prices moving permanently to a significantly higher plane than they have occupied historically. Again, this may certainly occur although it does not comport with the State of Alaska's most recent long-term oil price outlook.

There are other factors that could bear on the project economics. The City of Hoonah points out in its comment that a fiber optic communications link would be installed along with the electrical transmission line and that additional benefits would flow from that. An alternative noted by AEA is that additional waste heat recapture from Hoonah's diesel generators might be possible, which would serve to reduce the economic cost of the Hoonah diesel scenario. Consideration of the costs and benefits of these possibilities is beyond the scope of this review.

NOTE ON SMALL HYDROELECTRIC PROJECTS RECENTLY CONSIDERED TO SERVE HOONAH

AEA asked that information be included in this report about small hydro projects near Hoonah that could be considered for possible development. Time and budget constraints for this review sharply limited the research that could be accomplished on this question. However, the D. Hittle report did include the following two paragraphs on the subject:

> "Recently, the City of Hoonah has investigated the feasibility of two small hydroelectric projects. A report in June 2002 by Hydro West, Inc. provided basic information on the Gartina Falls project and the Water Supply Creek project, both of which would have a generating capacity of 600 kW each. The Gartina Falls project would provide an estimated 1,900 MWh per year and the Water Supply Creek project would provide an estimated 1,800 MWh per year. The estimated cost of the Gartina Falls project is $3.75 million while the Water Supply Creek project would cost an estimated $3.1 million. Based on assumed 50% grant funding and 50% funding with 0% interest rate loans, the estimated cost of energy from the two projects is 6.0 cents per kWh and 5.6 cents per kWh for the Gartina Falls and Water Supply Creek projects, respectively. The cost of power from these projects would be significantly higher if grant funding were not available.
>
> Neither the Gartina Falls nor Water Supply Creek projects are preliminarily considered to have significant fish habitat impacts. The Water Supply Creek project site is above the anadromous fish barrier, which is Gartina Falls. There are deep pools at the base of Gartina Falls that are considered important for fish holding. The costs, above, include estimated amounts for mitigation of this issue, however, Hydro West indicates that additional study will be needed to fully identify all environmental issues with the projects."[8]

There is a fairly lengthy history of consideration for building a hydro project at Gartina Falls. A reconnaissance study completed in 1979 by Harza Engineering Company for the Alaska Power Authority suggested that the site was promising from the standpoint of technical and economic feasibility. A 1998 review by HDR Alaska, Inc. for the City of Hoonah again suggested that a Gartina Falls project would be technically feasible although the economics did not look favorable especially in light of the relatively low fuel prices at that time. The HDR Alaska concept was to build a "run-of-river" project with costs and output characteristics very much like those cited above in the D. Hittle report. The project would offset roughly 30% of the fuel presently used to generate power for Hoonah from IPEC's diesel generators.

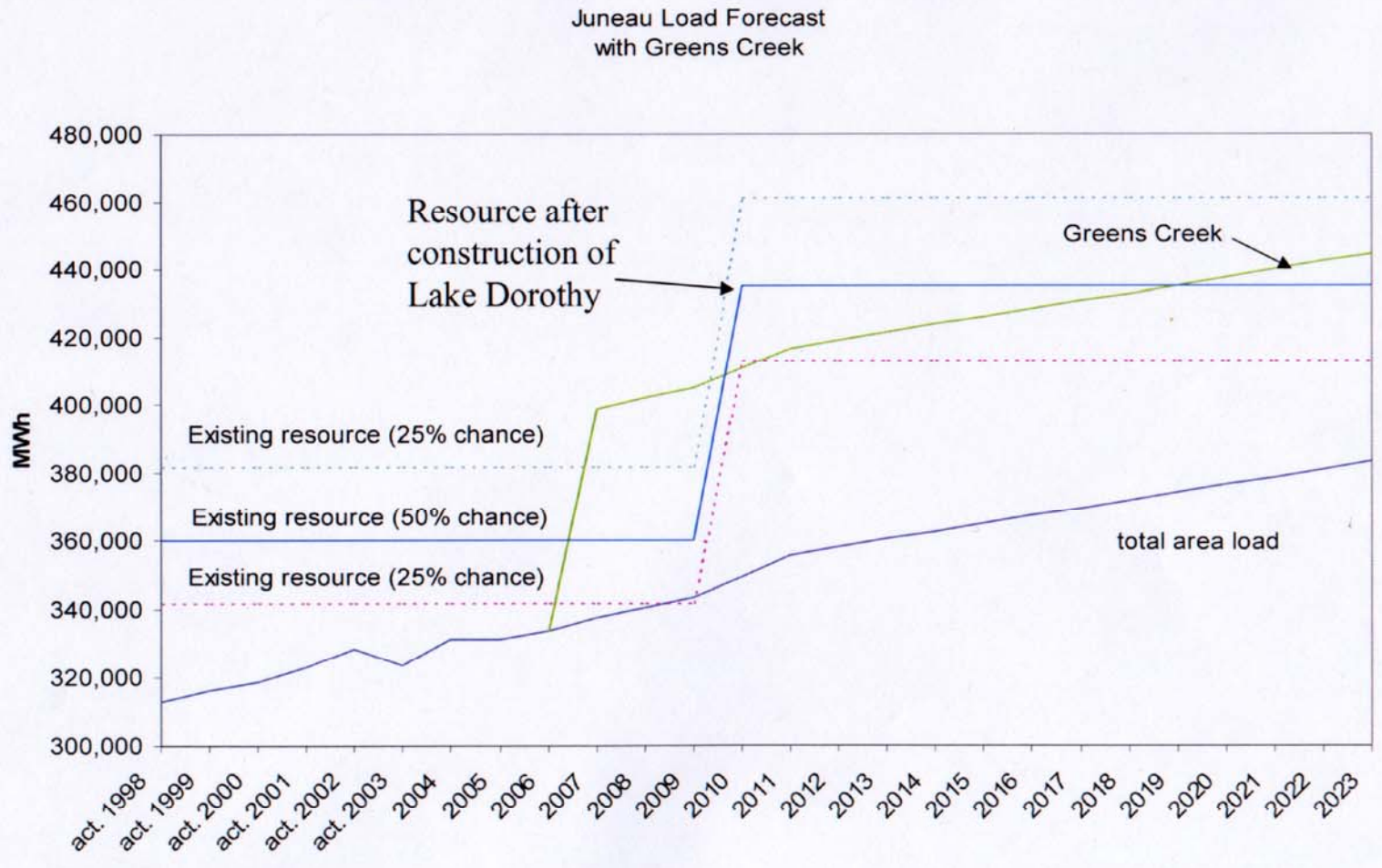
[8] Southeast Alaska Intertie Study, Phase 1 Final Report, D. Hittle & Associates, pages 6-13 to 6-14, December 2003.

ATTACHMENT A

AEL&P

Lake Dorothy Project

By Time Completed, Juneau Loads Exceed Existing Firm Hydro



ATTACHMENT B

Comment Submitted by City of Hoonah and IPEC (March 10, 2006):

JUNEAU TO HOONAH INTERTIE

ALTERNATE ENERGY/LOCAL HYDRO

Numerous Hydroelectric studies have been completed by a variety of organizations over the years. The first study to be completed was by Harza Engineering for the State of Alaska's Power Authority in 1979. The work by Harza was in depth and addressed the same questions posed by the Denali Commission. The Harza findings describe the unsuitable topography surrounding Hoonah that eliminates any hydroelectric potential other then Gartina Creek. No high elevation lakes exist in the immediate area. The potential Gartina Hydroelectric location would be undersized for the town's current energy needs. The 600 KW that could be produced in this run of the river facility cannot meet the 1.8 MW need that does exist. The Gartina location would also not eliminate our dependence on diesel. In the same study, truly "alternative" energy production was also investigated and ruled to be cost prohibitive.

The conclusions in the Harza report, coupled with similar conclusion in the AP&T and HDR reports, led the City to embrace the intertie concept. Let's not forget that this is a stand alone project that is half built. We realize that having Greens Creek on the same intertie was what allowed the project to move forward. However, we must condition that statement with the fact that public money was devoted to the intertie with the belief that it would also benefit Hoonah. We find it difficult to believe that public dollars would have been solely allocated for the benefit of two private companies without benefiting the public. We are confused by the newly found scrutiny because the transmission line is half built. Where were the investigative questions and concerns last year?

The load forecast in the initial AEA report was based on Power Cost Equalization numbers. This data precludes the commercial users in and around Hoonah. To provide accurate numbers that include the commercial users who self generate, we polled them as to the size generators that they operate. The commercial operators are the Icy Straits Lumber and Milling, which operates a sawmill and associated dry kiln, and Hoonah Cold Storage, a local seafood processor. The old Whitestone logging camp facility was also not included in the AEA report due to the belief that it was to be shutdown. In reality, it has been converted to a low income housing project with five families and a proposed halfway house facility. Hoonah Trading Company, the local grocery, hardware and fuel distributor, will also join the local grid once the intertie is completed. All of the aforementioned users are added to the spreadsheet to indicate the true load requirements that add to the viability of the intertie.

In the AEA report, the life span of the transmission cable was listed at 30 years. The manufacturer of the cable has sent correspondence that the practical lifespan is 50 years. The cost benefit analysis was revisited by IPEC and the fuel price that was established at $1.85 was adjusted to the actual 2005 average price of $2.22. Even without adding all potential commercial users who currently self-generate, by using the actual price of fuel the 50 year life span of the project, the cost benefit analysis is above 1.

One item that doesn't fit into the cost/benefit analysis package, but will have an impact on Hoonah's economic future, is the broadband access that will be installed concurrently with the transmission line. The fiber optic connection will allow access for medical procedures and allow for growth in the technology fields. Hoonah has a demonstration project with the Department of Defense in which blueprints are digitized and sent electronically. This project is a success but its future rests on the ability to upgrade the digital connections needed to run this project.

FUNDING STRATEGY

The $48 million Juneau to Hoonah Intertie funding strategy (that also includes the wholly privately financed Lake Dorothy Hydroelectric Project) has been to pursue a combination of private and federal funding. The private sector has already provided about $5 million, and about $15 million has already been received in federal support. We are now seeking the remaining $28 million from federal sources to complete the remaining 29.5 miles of the intertie. Keep in mind that 20 million dollars will be privately funded for the construction of the Lake Dorothy Hydroelectric project. This final phase will go from the Greens Creek mine on Admiralty Island to Hoonah on Chichagof Island, with the major portion consisting of a 26-mile submarine cable linking Admiralty and Chichagof islands.

The $15 million in previous federal funding was provided in 2004 and 2005 for construction between north Douglas Island in Juneau and Admiralty Island. The $5 million provided by the private sector was for the initial 11 miles of intertie from near downtown Juneau to north Douglas Island.

For the current fiscal year, $8.6 million from the Denali Commission, coupled with a $1 million Department of Energy appropriation, will lower the remaining need to $18.4 million. Our efforts to secure the remaining funding have brought us to the Commission while we continue to pursue both federal and state assistance. Specifically, the Alaska Congressional delegation has asked us to intensify our efforts for state support, and we are doing this.

While our efforts are focused on the Juneau to Hoonah intertie, we realize we are being grouped with efforts involving other elements of the overall Southeast Intertie System. We do not want any other intertie segments to be confused with the Juneau-Hoonah segment. We are not trying to secure the projected $385 million for an overall Southeast intertie system. The Juneau to Hoonah leg is an individual component not dependent on other segments.

A confederation similar to the Southeast Intertie System is the Denali Commission's bulk fuel tank upgrade program. The State and Denali have identified the overall need to upgrade all or most of the existing bulk tanks in rural Alaska. But in that case, for example, Shishmaref is not required to answer on how the rest of rural Alaska will be funded in regards to the rural tank farms.

Whether we will be before the Denali Commission for additional funding in the future is not simply our decision. We will continue to make our case to Alaska's Congressional delegation and – as in the past several years – our delegation will give us direction on how and where to proceed in our quest for federal match funding to complete the Juneau-Hoonah intertie.

ATTACHMENT C

Comment Submitted by Dave Carlson, Former Chairman of Southeast Conference Energy Committee (March 30, 2006)

The following are some comments concerning the Juneau – Hoonah Intertie and specifically the segment between Greens Creek on Admiralty Island and Hoonah. I will try to accurately reflect the position held by Southeast Conference which was my previous employment prior to my current position with the Four Dam Pool.

I first want to address a couple assumptions in the Emerman report. The cost of diesel seems unreasonably low at $1.25/gal. This is certainly true compared with today's prices. It is difficult to predict what the cost of fuel will be next year, let along 30 years out into the future. What we can predict with some accuracy, however, is the cost of hydro generated electricity. Historically, hydro prices tend to remain very stable over time. This has certainly been our experience with the Four Dam Pool projects and also from hydro projects I am familiar with in Southeast Alaska. My point is this: I don't think it is wise to 'throw a dart at a dart board' trying to judge the economics of diesel generated electricity. The price could be at $1.25 or it could be at $5.00. Historical prices will show wildly fluctuating prices of extremes. Again, hydro produced power remains very stable.

The second aspect of the report I find troubling is the life of the study. Hydro projects age well. Some in Southeast Alaska have been generating power for over 100 years. In my former hometown of Petersburg, the Blind Slough project has been generating (and replacing fossil fuel generation) since 1920 and it was just re-licensed for another 30 years. The cost of electricity from that project is probably less than $ .02/kwh.

Lastly, another flaw I find in the report is the 'theme' that there won't be available hydroelectric power available from the Lake Dorothy Hydro project. I am fairly certain that the Power Sales Agreement between AEL&P and Greens Creek specifies that Hoonah has precedence. More importantly, it is useful pointing out that hydro projects are usually added incrementally as required to meet power supply demands. I am not aware of any utilities in Southeast Alaska that do not plan for incremental hydro generation additions to their system. I am strongly suggesting that AEL&P will continue to develop additional hydro resources to meet their future loads and interconnected loads such as Greens Creek (which has a finite life) and the City of Hoonah.

Another follow-on point which should be considered is the potential addition of the hydro projects (Gartina Falls and Water Supply Creek) after the Intertie segment is completed. I believe both of these projects are 'run-of-river' projects with limited storage. Obviously, as stand-alone projects, these would not work well serving Hoonah's continuous year-round loads. However, when interconnected into a system that has storage projects, they may integrate very well into the system.

My last comments pertain to the basic 'vision' that Southeast Conference laid out for Southeast Alaska. Simply put, the concept is to develop an integrated and interconnected transmission system so hydro resources throughout the region and be developed and shared. The primary purpose of this 'vision' is to reduce the dependence upon fossil fuel generation. If you examine electric rates throughout the Southeast Alaska region, you will find the most stable and lowest rates in communities that have been dependent upon hydro generation for some period of time. Contrasting with that, you will find the highest and most unstable rates in communities that are 100% dependent upon fossil fuel generation. I don't see that trend changing anytime soon. The utilities working together at Southeast Conference developed a plan and a vision for reducing dependence upon fossil fuel by extending transmission lines and building new hydro

projects. Part of this plan included an interconnection to Hoonah from Juneau. Southeast Alaska has the hydro potential to serve the region's needs for centuries. The fuel that runs the turbines is free. The piece that is missing to make this work for the entire region is a transmission system. I would encourage careful deliberation and thought before making a final decision on the transmission interconnection to Hoonah.

Thanks for the opportunity to respond.

Dave Carlson

ATTACHMENT D