BUILDING A WORLD OF DIFFERENCE

13 March 2012

Southeast Alaska IRP

Southeast Conference Mid-Session Summit

BLACK & VEATCH
Building a world of difference.

Key Drivers

- Limited Size

20% - size of SE region relative to Railbelt

- Economic Realities and Population Trends
- Limited Transmission
- Diesel Fuel Prices

60% - 75% - space heating portion of monthly energy bill

- Significant Uncertainties (Including Hydro Projects)

300/24 – number of hydro projects considered/passed screen

- Sub-regional Difference Require Solutions for Each Sub -region

9 – 60+ cents/kWh – range of pre-PCE cost of electricity

- Space Heating Conversions

Committed Resources

PROJECT	DISCUSSION	TOTAL CAPITAL COST ($ MILLION)	ESTIMATED REMAINING CAPITAL COST ($ MILLION)
Blue Lake Expansion Hydro (Sitka, City of Sitka Electric)	Expansion will increase the capacity of the existing Blue Lake Hydro Project by an estimated 8 MW and increase the average annual energy from the project by approximately 34,500 MWh.	$96.5	$1.0 (Note 1)
Gartina Falls Hydro (Hoonah, IPEC)	New run-of-river project near Hoonah that will provide an estimated 0.44 MW of capacity and approximately 1,800 MWh of average annual energy.	$6.3	$5.5
Reynolds Creek Hydro (Hydaberg, Haida Energy and AP&T)	New storage project located that will provide an estimated 5 MW of capacity and approximately 19,300 MWh of average annual energy.	$28.6	$0.0 (Note 2)
Thayer Creek Hydro (Angoon, Kootznoowoo, Inc.)	New run-of-river project that will provide an estimated 1 MW of capacity and approximately 8,400 MWh of average annual energy.	$15.2	$6.0 (Note 3)
Whitman Lake Hydro (Ketchikan, KPU)	New storage project at an existing lake located that will provide an estimated 4.6 MW of capacity and approximately 15,900 MWh of average annual energy.	$25.8	$3.3 (Note 1)
Kake – Petersburg Intertie (Kwsan Electric Transmission Intertie Cooperative)	New 69 kV overhead and submarine cable transmission line connecting Kake and Petersburg.	$53.8	$48.3
Ketchikan – Metlakatla Intertie (Metlakatla Indian Community)	New 34.5 kV overhead and submarine cable transmission line connecting Ketchikan and Metlakatla.	$12.7	$8.2
	Totals	**$238.9**	**$72.3**

Notes:

1. Local bonding under way. Community request pending.
2. Authorized loans being negotiated.
3. $7.0 million Renewable Energy Round 5 award recommendation.

Key Conclusions

- Uncertainties lead to the need to:
  - ✓Develop multiple options
  - ✓Move towards a more balanced resource portfolio
  - ✓Maintain flexibility
- Phased Approach to the Future
- Aggressive Pursuit of DSM/EE Delays Need for Incremental Hydro
- Aggressive Pursuit of Biomass Conversion will Result in Very Significant Space Heating Savings

Key Conclusions (continued)

RESOURCES	PHASE 1 (2012-2016)	PHASE 2 (2017 AND BEYOND)
Committed Resources	√	
DSM/EE Programs	√	√
Biomass Conversion Programs	√	√
Next Increment of Hydro and Other Renewable Projects		√

Hydro Included in Recommended Resource Portfolio

- **19 MW – Committed Resources**
- **50 MW – other hydro**

Key Conclusions (continued)

- **Economic Realities of SE Intertie Concept**
  - ✓ Built upon previous studies, including SE Intertie Study
  - ✓ Two cases
    - Economic Case
    - Public Benefit Case
  - ✓ Insufficient loads to justify expansion of transmission network beyond transmission Committed Resources

0 – number of transmission segments with unit costs less than diesel under Economic Case

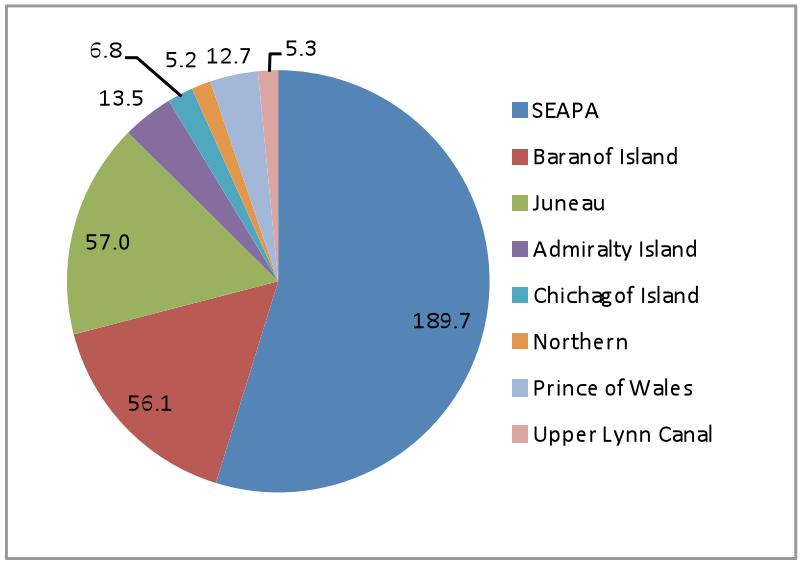
0.10 – 0.32 – benefit-cost ratios of transmission segments under Public Benefit Case

Key Findings (continued)

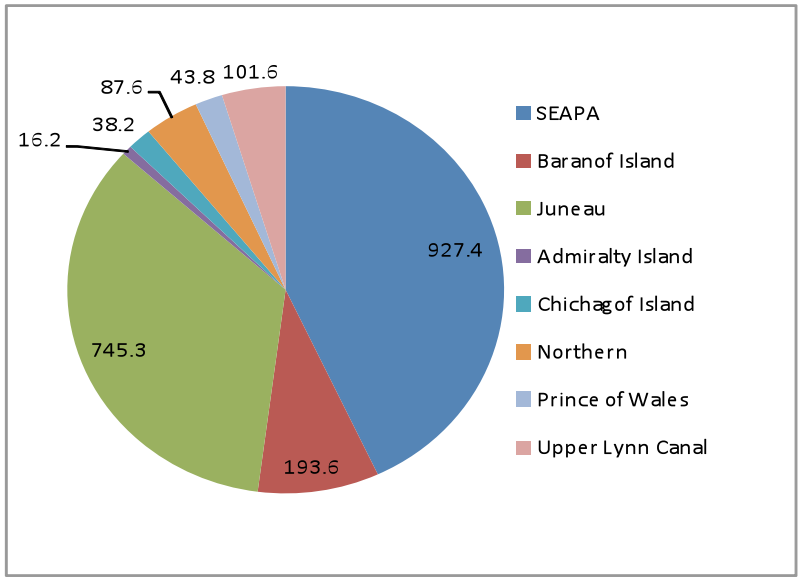
- **AK-BC Intertie**
  - ✓Screening level analysis of both import and export scenarios
  - ✓Not justified based upon current market conditions
  - ✓Significant uncertainties exist – most would have adverse impact

Subregional Equity Considerations

Capital Investment by Subregion – 2012 - 2014



Capital Investment by Subregion – 2012 - 2061



Total Capital Investments

2012 – 2014 – $346 million

2012 – 2061 – $2.15 billion

Capital Investment per Capita

	2012 - 2014	2012 - 2061
Urban Areas		
SEAPA	$12,495	$61,086
Baranof Island	$6,313	$21,796
Juneau	$1,824	$23,830
Urban Area Average	$5,472	$33,725
Rural Areas		
Admiralty Island	$29,417	$35,336
Chichagof Island	$6,854	$38,216
Northern	$4,670	$79,314
Prince of Wales	$3,820	$13,180
Upper Lynn Canal	$1,507	$28,732
Rural Area Average	$4,620	$30,496
Regional Average	$5,348	$33,255

Subregional Equity Considerations

OPTIMAL DSM/EE, BIOMASS AND OTHER RENEWABLES CASE - SAVINGS RELATIVE TO STATUS QUO CASE						
	Total Cumulative Net Present Value (CNPV) Savings – 2012 - 2061 ($'000)					
	Utility System Plus DSM Costs[1]		Oil Space Heating Plus Biomass Costs		Total	
	$	%	$	%	$	%
SEAPA	221,430	49%	418,993	43%	640,423	45%
Admiralty Island	(22)	0%	9,592	43%	9,570	32%
Baranof Island	1,671	2%	216,746	47%	218,417	39%
Chichagof Island	13,218	22%	29,950	51%	43,168	37%
Juneau	185,117	50%	977,503	46%	1,162,620	47%
Northern	33,670	38%	77,923	53%	111,593	47%
Prince of Whales	3,313	14%	180,036	49%	183,349	47%
Upper Lynn Canal	18,925	41%	172,791	50%	191,716	49%
Total Southeast Region	**477,322**	41%	**2,083,534**	46%	**2,560,856**	45%

[1]Includes savings from generic hydro projects.

Electric / Space Heating / Total Savings

- **41% / 46% / 45% – Recommended vs. Status Quo Cases**
- **17% / 46% / 42% – Recommended vs. Optimal Hydro Cases**

Regional Supporting Studies and Other Actions

DESCRIPTION	TIME FRAME	ESTIMATED COST
General Public Outreach/Education Program	2012	$250,000
Regional DSM/EE Program Start-up Costs	2012-2013	$2,325,000
Regional Biomass Conversion Program Start-up Costs	2012-2013	$2,225,000
Formation of Regional DSM/EE Entity Start-up Costs	2012	$500,000
Formation of Regional Biomass Conversion Entity Start-up Costs	2012	$500,000
Hydro Project-specific High Level Reconnaissance Studies	2012-2013	$2,000,000
Hydro Project-specific FERC License Application Preparation	2012-2014	$10,000,000
Regional Technical/Economic Market Potential Assessment of Non-Hydro Renewable Technologies	2012	$500,000
Other Renewable Project-specific High Level Reconnaissance Studies	2012-2014	$1,000,000
Support Tidal/Wave Technology Development	2012-2014	$1,000,000
Develop Standard Power Sales Agreement	2012	$200,000
Consider Development of Open Access Policy and Related Tariff (including terms and conditions of service)	2012	$250,000
Update Southeast Alaska IRP in 2014	2014	$750,000
Support Development of Tariff Structures That Better Reflect Costs	2012-2013	$1,550,000
Support Development of Weather Normalized Load Forecasts	2013	$375,000
Total		$23,425,000

Overall Summary

- 20% - size of SE region relative to Railbelt
- 60-75% - space heating portion of monthly energy bill
- 300/24 – number of hydro projects considered/passed screen
- 9 – 60+ cents/kWh – range of pre-PCE cost of electricity
- Hydro Included in Recommended Resource Portfolio
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Overall Summary (continued)

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- 0.10 – 0.32 – benefit-cost ratios of transmission segments under Public Benefit Case
- Electric / Space Heating / Total Savings
  - ✓ 41% / 46% / 45% – Recommended vs. Status Quo Cases
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"A journey of a thousand miles starts with a single step"

Building a world of difference.®

Together

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