

BUILDING A WORLD OF DIFFERENCE

Southeast Alaska IRP

AEA Board Meeting

2 February 2012



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Building a world of difference.

Key Findings

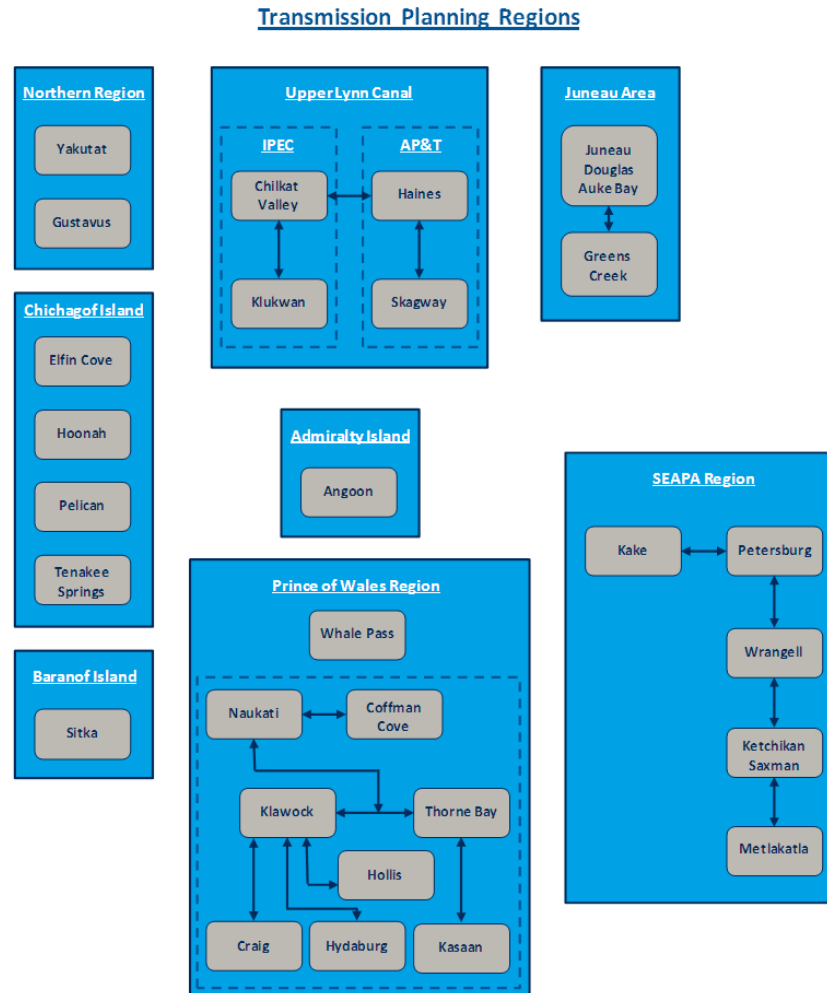
- **Key Drivers**
 - **Limited Size**
 - **Economic Realities**
 - **Population Trends**
 - **Limited Transmission**
 - **Diesel Fuel Prices**

Key Findings

- **Key Drivers (continued)**
 - **Significant uncertainties exist, including:**
 - **Loads**
 - **Resources**
 - **Potential transmission additions**
 - **Level of State financial assistance**
 - **Uncertainties lead to the need to:**
 - **Develop multiple options**
 - **Move towards a more balanced resource portfolio**
 - **Maintain flexibility**

Key Findings (continued)

- Subregional Differences Require Solutions for Each Subregion



Key Findings (continued)

- Shortage of Storage Hydro
- Space Heating Conversions
- Limitations Due to Quality and Inclusiveness of Project-Specific Information
 - Need to base analysis on generic hydro projects
 - Inability to make definitive selection
- 2 Integrated Cases:
 - Optimal Hydro/Transmission Case
 - Optimal DSM/EE, Biomass, Other Renewables Case

Key Findings (continued)

- **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**

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		√

Key Findings (continued)

Committed Resources

PROJECT	DISCUSSION	TOTAL CAPITAL COST (\$ MILLION)	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	\$47.5
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	\$8.1
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	\$13.0
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	\$13.4
Kake – Petersburg Intertie (Kwaan 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	\$144.0

Key Findings (continued)

- **Economic Realities of SE Intertie Concept**
 - Built upon previous studies, including SE Intertie Study
 - Two cases
 - Economic Case
 - Unit cost of transmission greater than cost of diesel
 - Public Benefit Case
 - Cost-benefit ratios – 0.10 – 0.32
- Insufficient loads to justify expansion of transmission network beyond transmission Committed Resources

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**

Key Findings (continued)

- **Load Uncertainties due to Economic Development Efforts and Potential Mines**
- **Need for Continued State Financial Assistance and Proposed AEA Decision Framework and Policy**
- **Encourage Private Development of Resources**

Recommendations – Capital Projects

- Subregional Preferred Resource Lists – Phase 1

SUBREGION	RESOURCE	ESTIMATED CAPITAL COSTS (\$'000,000)	PROJECTED COMMERCIAL OPERATION DATE (COD)
SEAPA	Kake-Petersburg Interconnection	48.6	2015
	Ketchikan-Metlakatla Interconnection	8.2 ⁽¹⁾	2013
	Whitman Lake Hydro	13.4 ⁽¹⁾	2014
	Diesel	51.1	2012-2016
	DSM/EE	3.1	2012-2016
	Biomass	139.4	2012-2016
Admiralty Island	Thayer Creek Project	13.0 ⁽¹⁾	2016
	DSM/EE	0.0 ⁽³⁾	2012-2016
	Biomass	0.8	2012-2016
Baranof Island	Blue Lake Hydro	47.5	2015
	Diesel	20.2	2012-2016
	DSM/EE	0.9	2012-2016
	Biomass	14.1	2012-2016
Chichagof Island	Gartina Falls Hydro	5.5	2015
	Diesel	0.3	2012-2016
	DSM/EE	0.0	2012-2016
	Biomass	1.9	2012-2016
Juneau	Diesel	20.2	2012-2016
	DSM/EE	3.6	2012-2016
	Biomass	63.3	2012-2016
Northern	Diesel	2.8	2012-2016
	DSM/EE	0.0	2012-2016
	Biomass	4.1	2012-2016
Prince of Wales	Reynolds Creek Hydro	5.5 ⁽²⁾	2014
	DSM/EE	0.0 ⁽³⁾	2012-2016
	Biomass	8.9	2012-2016

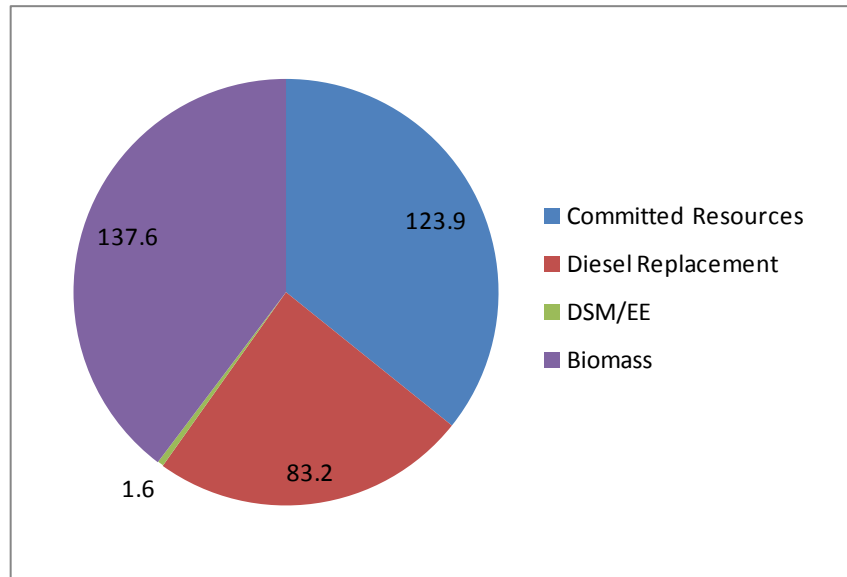
Recommendations – Capital Projects

- Subregional Preferred Resource Lists – Phase 2

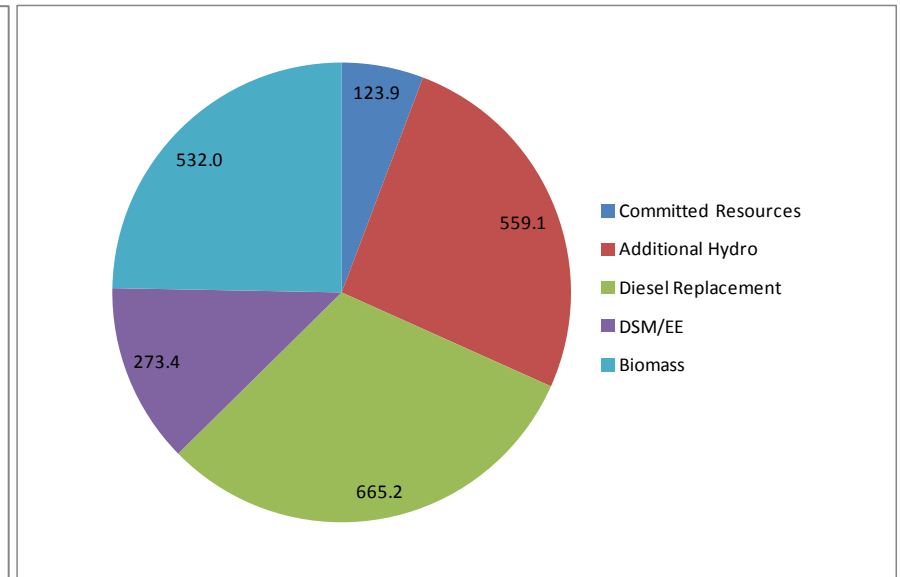
SUBREGION	RESOURCE	ESTIMATED CAPITAL COSTS (\$'000,000)	PROJECTED COMMERCIAL OPERATION DATE (COD)
SEAPA	Hydro – Storage (10 MW)	193.1	2044
	Diesel	202.8	2017-2061
	DSM/EE	102.1	2017-2061
	Biomass	166.0	2017-2021
Admiralty Island	Diesel	1.7	2017-2061
	DSM/EE	0.1	2017-2061
	Biomass	0.7	2017-2021
Baranof Island	Diesel	83.4	2017-2061
	DSM/EE	31.4	2017-2061
	Biomass	16.1	2017-2021
Chichagof	Hydro – Run of River (1 MW)	21.7	2035
	Diesel	6.4	2017-2061
	DSM/EE	0.8	2017-2061
	Biomass	1.6	2017-2021
Juneau	Hydro – Storage (10 MW)	237.5	2051
	Diesel	216.6	2017-2061
	DSM/EE	124.5	2017-2061
	Biomass	79.5	2017-2021
Northern	Hydro – Storage (1 MW)	18.6	2017
	Hydro – Run of River (1 MW)	32.8	2049
	Diesel	23.3	2017-2061
	DSM/EE	1.3	2017-2061
	Biomass	4.7	2017-2021
Prince of Wales	Diesel	16.6	2017-2061
	DSM/EE	66.4	2017-2061
	Biomass	10.2	2017-2021

Capital Investment by Category

Capital Investment by Category
2012 - 2014



Capital Investment by Category
2012 - 2061



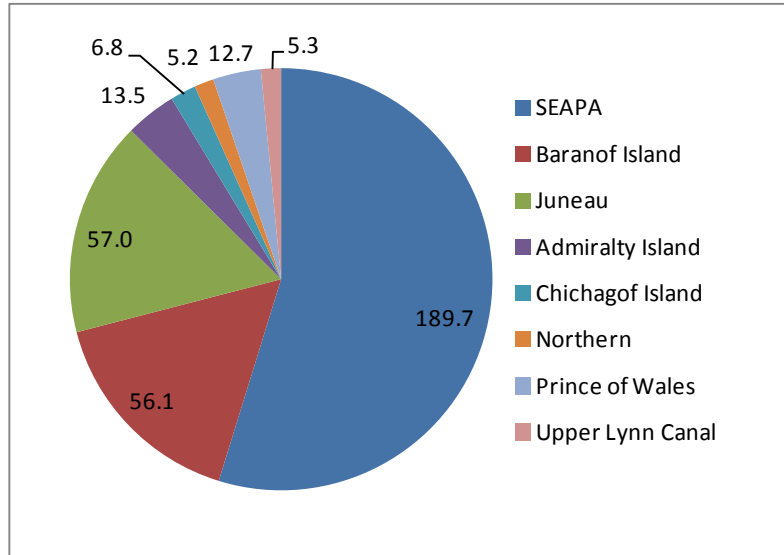
Total Capital Investments

2012 – 2014 – \$346 million

2012 – 2061 – \$2.15 billion

Subregional Equity Considerations

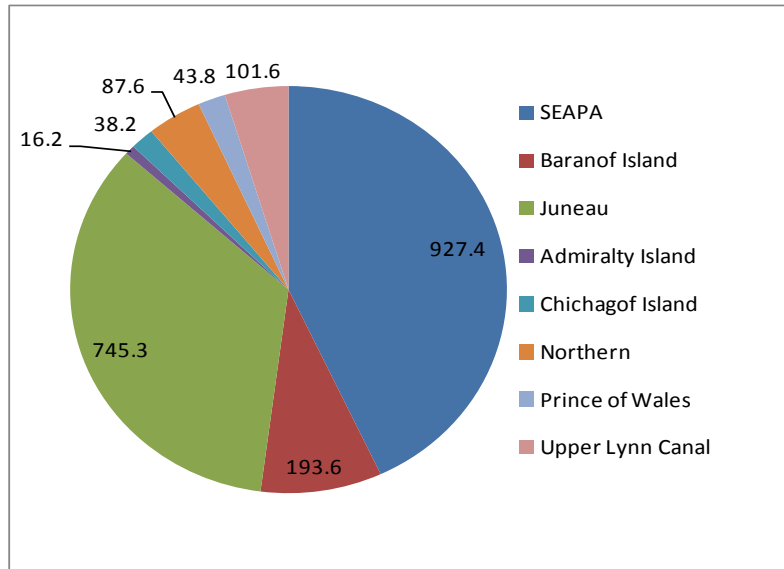
Capital Investment by Subregion – 2012 - 2014



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

Capital Investment by Subregion – 2012 - 2061



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.

Recommendations - Other

- Public outreach program
- AEA decision framework and policy
- Appropriate funds for regional DSM/EE program
- Appropriate funds for regional biomass conversion program
- Evaluate regional entity to implement DSM/EE and biomass conversion program
- Appropriate funds for hydro/other renewables reconnaissance studies and FERC license applications
- Technical/market potential study of non-hydro renewables

Recommendations - Other

- Support further development of tidal and wave power
- Develop standard power sales agreement
- Consider transmission open access policy
- Update IRP in 2014-2015
- Evaluate rate structure changes
- Streamline regulatory and permitting processes

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

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