Southeast Alaska Integrated Resource Plan

Advisory Work Group Meeting
November 8th, 2011

Contractor: Black & Veatch, Kevin Harper, Project Manager
AEA Project Manager: Jim Strandberg
Public process coordinator: Robert Venables, Southeast Conference
Advisory Workgroup Chair: Rick Harris, Sealaska

ALASKA ENERGY AUTHORITY

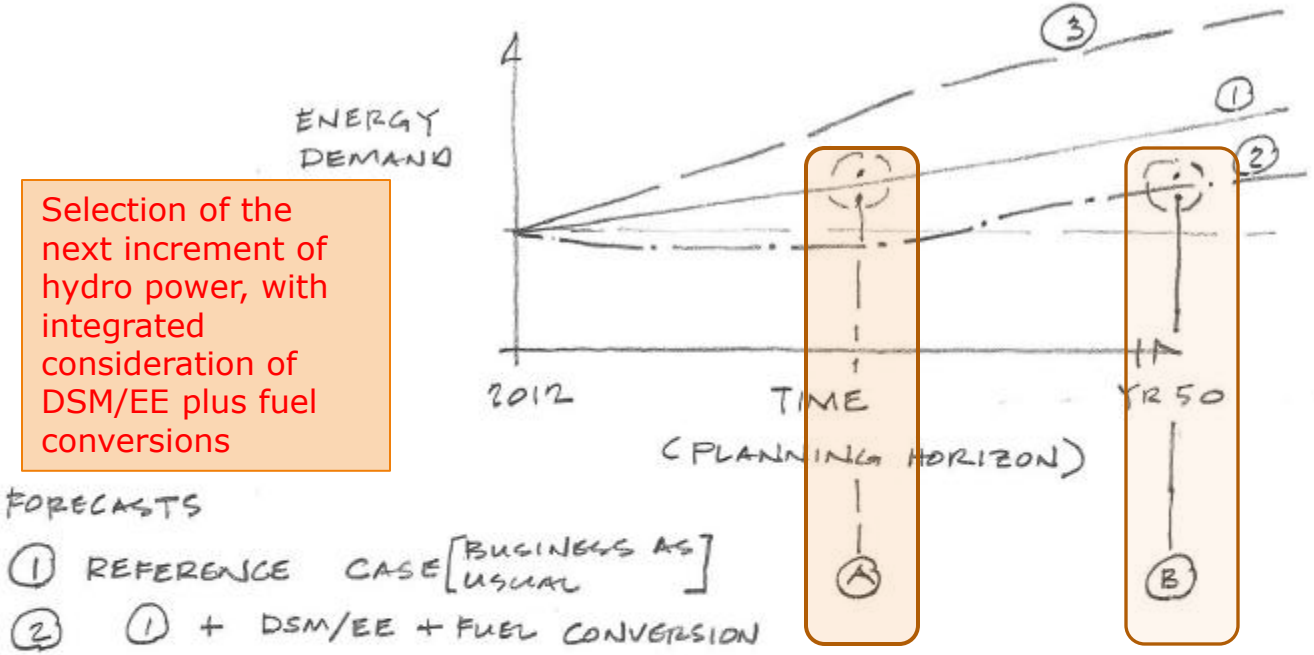
- The list – Which Hydro Electric Power Projects should be developed for Southeast Alaska, and when should they be developed?
  - *Regional Screening Process*
  - *Detailed Analysis at sub-region level*
  - *Action plan recommendations*
  - *Project capital appropriations*
- How should we consider
  - *Demand Side Management/Energy Conservation*
  - *Fuel Conversions*
  - *Load growth*

SEIRP

- SEIRP Output – a *focused integrated plan* that defines DSM/EE, Fuel Conversion/hydro power additions to satisfy future energy needs at least cost to the Rate Payer.
- Capital projects defined in SEIRP
  - Hydro power generation
  - Transmission lines
  - DSM/EE capital needs
  - Fuel conversions

- Task 1 - Screening for short list – approximately 24 hydro power projects for SE Alaska
- Task 2 - Analyze and develop a list of generic projects for use in economic models
  - Economic Model used: Strategist
- Task 3 – Recommend capital projects and action plan

Selection of the next increment of hydro power, with integrated consideration of DSM/EE plus fuel conversions



FORECASTS

1. REFERENCE CASE [BUSINESS AS USUAL]
2. 1 + DSM/EE + FUEL CONVERSION
3. HIGH LOAD FORECAST OPTION

A. TIME FOR NEXT INCREMENT OF RENEWABLE ENERGY W/ REFERENCE CASE LOAD FORECAST.

B. W/ INTEGRATED ENERGY APPROACH [NEXT HYDRO

SEIRP

AEA Hydropower Project Development Funding Approach

AEA ESTABLISH DEVELOPMENT STANDARDS FOR NEXT INCREMENTS.

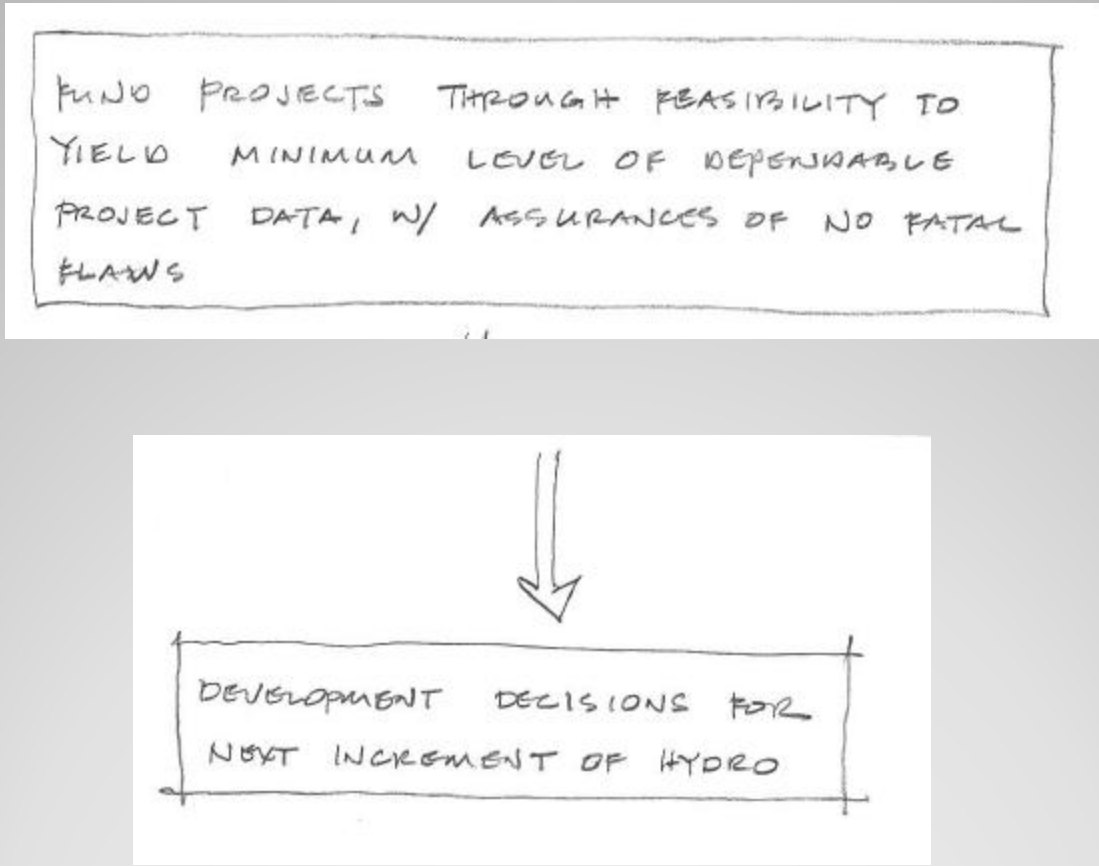
- COORDINATE W/ RENEWABLE ENERGY GRANT PROGRAM
- DIRECT FUNDING THROUGH RISK MATRIX APPROACH
- ALL GRANT FUNDED DEVELOPMENT WORK CONFORM TO STANDARDS SET BY AEA
- BEST LOOKING PROJECTS RECEIVE FUNDING

AEA funding concerns are driving this risk matrix consideration

FUND PROJECTS THROUGH FEASIBILITY TO YIELD MINIMUM LEVEL OF DEPENDABLE PROJECT DATA, W/ ASSURANCES OF NO FATAL FLAWS

SEIRP

AEA Hydropower Project Development Funding Approach



SEIRP

- Generic projects to meet future demand, described in terms of cost, power output energy production

List of available resources identified by proposed developers, as well as other projects suggested by B & V, using all available information including developer data

Critical Analysis, done by sub-region, incorporating new generation and transmission infrastructure analysis (Strategist), with Energy Conservation, Demand Side Management, and possible fuel conversions to define the best SE region energy future.

End game – a defined list of capital appropriations to develop energy infrastructure to supply regional energy needs, and an accompanying action plan.

SEIRP

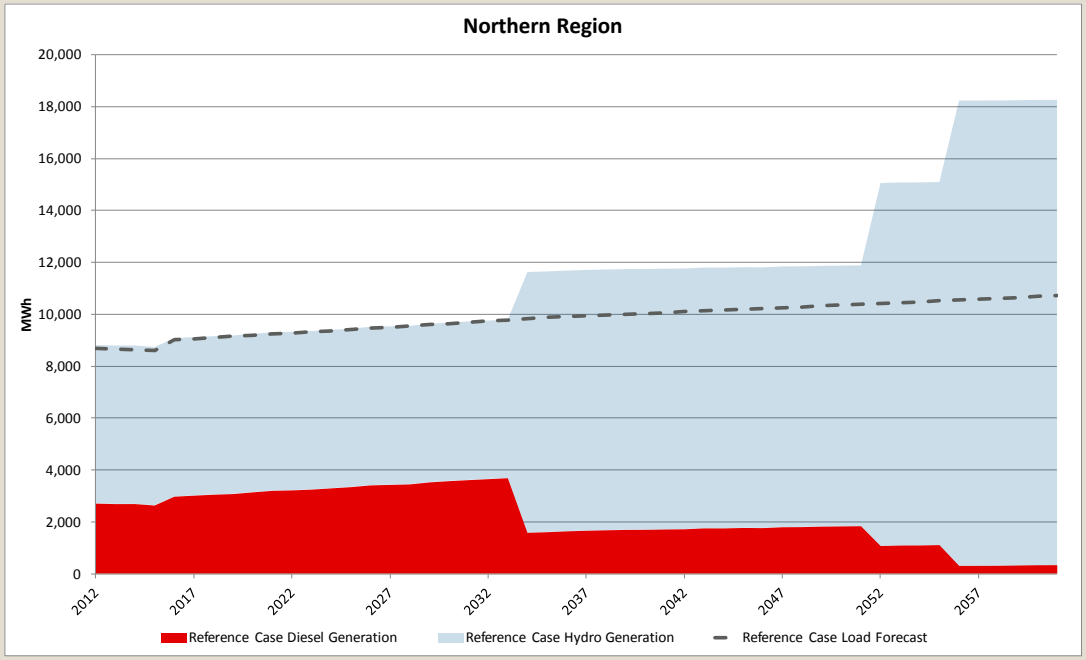
B&V Proposed Risk Evaluation Matrix - draft

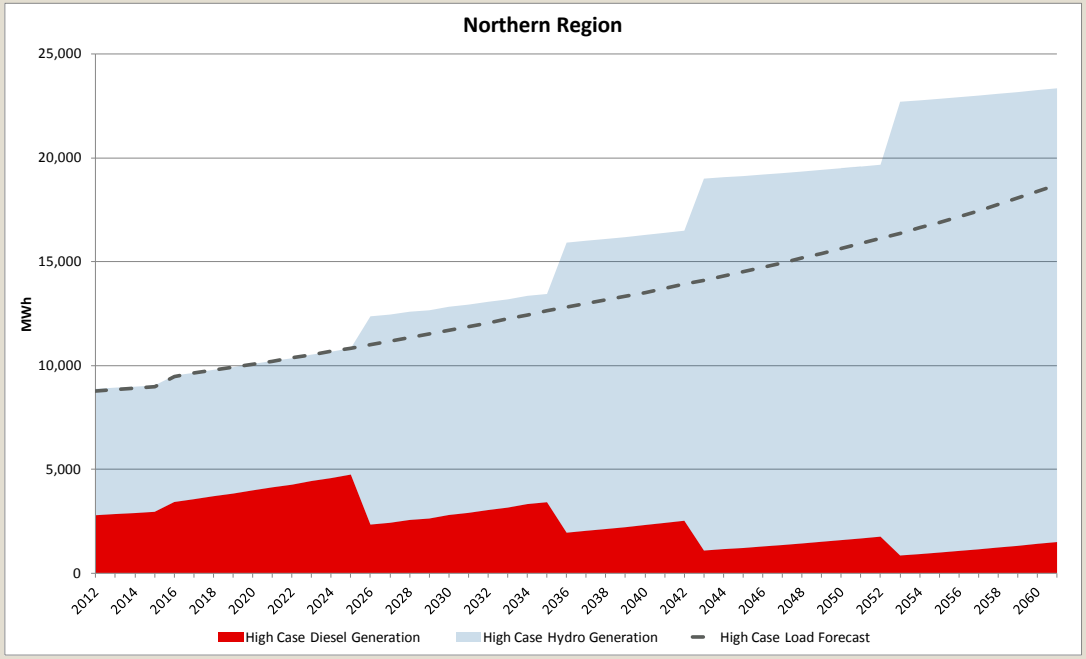
PROJECT NAME	LOCATION	PROJECT DEVELOPMENT				OPERATIONAL		
		DEVELOPMENT LEVEL (1-5)	CONSTRUCTABILITY/ RELIABILITY ACCESS (1,3,5)	LICENSING/ PERMITTING (1,3,5)	BUSINESS AND FINANCIAL STRUCTURE (1-5)	HYDROLOGY (1,3)	OPERATING FLEXIBILITY (1,3,5)	PROJECT LINE MAINTENANCE (1,3,5)
Baranof Island								
Takatz Lake	Sitka	3	5	3	4	1	1	5
Chichagof Island								
Crooked Creek and Jim's Lake	Elfin Cove	2	1	5	5	1	3	3
Indian River	Tenakee Springs	3	5	5	4	1	5	3
Water Supply Creek	Hoonah	3	1	5	4	1	5	1
Juneau Area								
Lake Dorothy Expansion	Juneau	2	3	5	2	1	1	1
Sweetheart Lake	Juneau	2	5	3	4	1	1	5
Upper Lynn Canal								
Connelly Lake	Haines	3	3	3	2	1	5	3
Schubee Lake	Skagway	5	5	3	2	5	3	5
Walker Lake	Chilkat Valley	4	1	5	5	1	5	3
West Creek	Skagway	5	1	5	4	5	5	3
SEAPA								
Anita - Kunk Lake	Wrangell	4	5	5	5	5	5	5
Cascade Creek	Petersburg	2	5	3	4	1	5	5
Connell Lake	Ketchikan	4	1	3	5	1	5	1
Lake Shelokum	Wrangell	5	5	3	4	1	5	5
Mahoney Lake	Ketchikan	1	1	1	4	1	3	1
Orchard Lake	Meyers Chuck	5	5	5	5	1	5	1
Ruth Lake	Petersburg	4	5	3	4	5	5	5
Scenery Creek	Petersburg	4	5	3	4	5	5	5
Sunrise Lake	Wrangell	3	3	3	5	1	5	3
Thoms Lake	Wrangell	4	3	5	5	1	5	3
Triangle Lake	Metlakatla	3	3	5	4	1	5	3
Tyee New Dam Construction	Wrangell	4	5	5	5	1	1	1
Tyee New Third Turbine	Wrangell	4	5	5	5	1	5	1
Virginia Lake	Wrangell	4	5	5	5	1	5	5

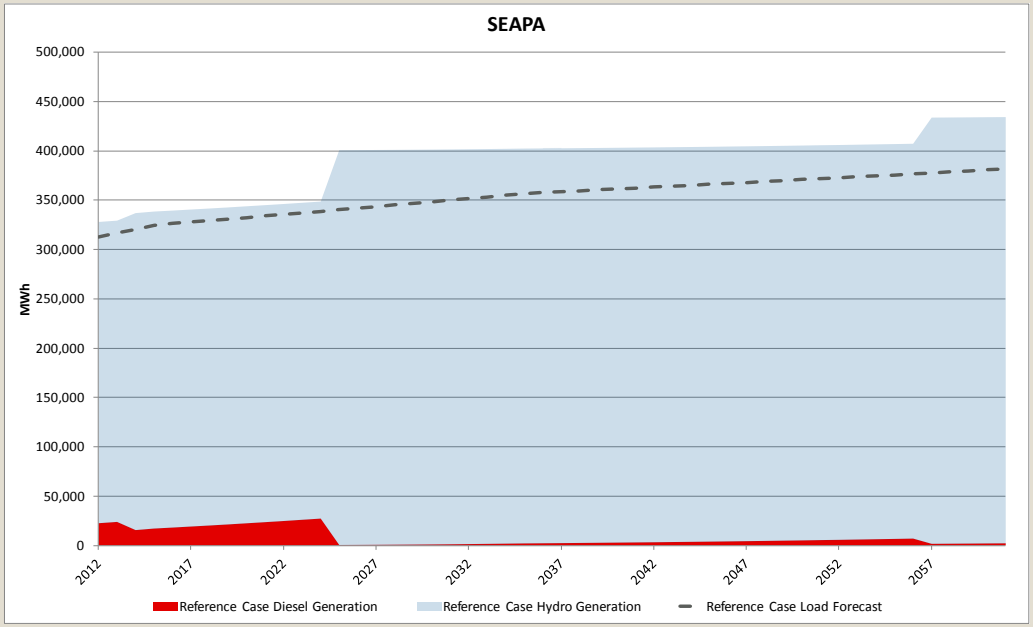
SEIRP

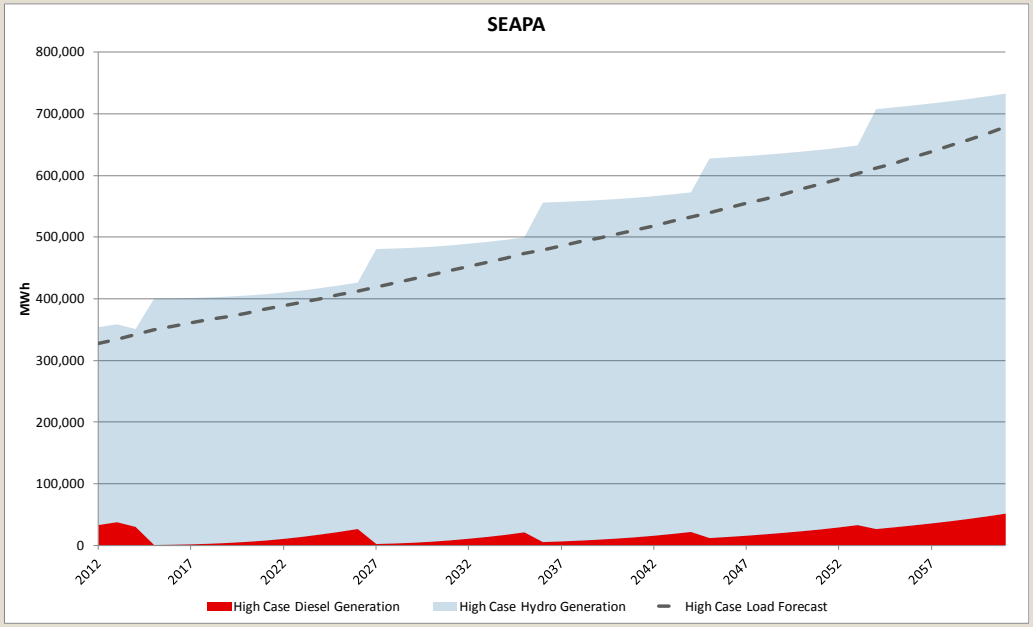
Difficulties Related to Hydro Project Information

- Realistic commercial operation dates (CODs)
- Capital costs
- Storage capacity, if any, and monthly energy output
- Environmental, permitting and licensing issues
- Business structure and agreements, including ownership structure, project development capabilities, power sale and interconnections agreements, and so forth


Northern Region
MWh
20,000
18,000
16,000
14,000
12,000
10,000
8,000
6,000
4,000
2,000
0
2012
2017
2022
2027
2032
2037
2042
2047
2052
2057
Reference Case Diesel Generation
Reference Case Hydro Generation
Reference Case Load Forecast


Northern Region
MWh
25,000
20,000
15,000
10,000
5,000
0
2012
2014
2016
2018
2020
2022
2024
2026
2028
2030
2032
2034
2036
2038
2040
2042
2044
2046
2048
2050
2052
2054
2056
2058
2060
High Case Diesel Generation
High Case Hydro Generation
High Case Load Forecast


SEAPA
500,000
450,000
400,000
350,000
300,000
250,000
200,000
150,000
100,000
50,000
0
MWh
2012
2017
2022
2027
2032
2037
2042
2047
2052
2057
Reference Case Diesel Generation
Reference Case Hydro Generation
Reference Case Load Forecast


SEAPA
800,000
700,000
600,000
500,000
400,000
300,000
200,000
100,000
0
MWh
2012
2017
2022
2027
2032
2037
2042
2047
2052
2057
High Case Diesel Generation
High Case Hydro Generation
High Case Load Forecast

Approach to Integrated Analysis

- Optimal Hydro/Transmission Case
- Optimal DSM/Biomass/Other Alternatives Case
- Expected results – PNWC and Capital Costs
- Link to Preferred Resource List/Appropriations Request

Preview of Conclusions

- Significant uncertainties exist: loads, resources, potential transmission additions, and level of State financial assistance
- Uncertainties lead to the need to:
  - Develop multiple options
  - Move towards more balanced resource portfolio
  - Maintain flexibility
- Limitations due to quality and inclusiveness of project-specific information
- This led to the need to base analysis on generic hydro projects – inability to make definitive selection

Preview of Conclusions (con't)

- 2 integrated cases:
  - Optimal hydro/transmission case
  - Optimal DSM/EE, biomass, other renewables case
- Comparative results led to near-term resource selection
- Near-term resource portfolio and actions
  - Committed Resources
  - DSM/EE
  - Biomass conversions
  - Project feasibility studies to identify next increment of hydro (AEA developed process and standards, link with REGF)

Preview of Conclusions (con't)

- Long-term decisions based on revised IRP (3 years)
- Transmission planning philosophy (public benefit)
- Do not move forward with AK-BC Intertie unless conditions changes and detailed studies (e.g., SEAPA system improvements) completed
- Types of risks and uncertainties related to each technology
- Need for State financial assistance

Preview of Recommendations

- Resource additions by sub-region
  - Near-term – Committed Resources, DSM/EE, biomass conversions
  - Longer-term – TBD based on better information on potential hydro and other renewable projects, and experience with DSM/EE and biomass conversions
- Other
  - Public outreach – SEIRP, DSM/EE, biomass conversions
  - Governor/Legislature make decisions regarding level of State financial assistance

Preview of Recommendations (con't)

- Appropriate money to start-up/expand regional DSM/EE and biomass program
  - Organizational costs
  - Vendor training
  - Detailed program design
  - Monitoring and evaluation protocols
- Consider regional entity/public-private partnership for start-up and delivery of DSM/EE and biomass program
- Further the development of tidal/wave power technology

Preview of Recommendations (con't)

- Support efforts to streamline regulatory and permitting processes
- Regional economic potential studies for non-hydro renewable technologies
- Develop standard power sale agreement
- Consider transmission open access policy