

BUILDING A WORLD OF DIFFERENCE

14 September 2011

Southeast Alaska Integrated Resource Plan (SEIRP)

Kevin Harper - Black & Veatch



BLACK & VEATCH
Building a world of difference.®

Agenda

- **Integrated Resource Planning**
- **Project Objectives and Scope**
- **Project Team Overview**
- **Approach to Specific Issues**
- **Final Report Content**
- **Questions and Answers**



Integrated Resource Planning

- Plan that economically schedules what, when, and where to build, based on available energy supplies
- Long-term time horizon
- Competes generation, transmission, fuel supply and DSM/energy efficiency options
- Includes renewable energy projects (including hydro)
- Arrives at a plan to build future infrastructure for minimum long-run cost to ratepayers
- Considers risks
- Considers of financing options

Integrated Resource Planning

Objective Function:

2012 Cumulative Present Value Costs

With consideration of:

- Regional issues and differences
- Energy security
- Environmental impacts
- Risks

Integrated Resource Planning - Limitations

- **Does not set State energy policy**
- **Directional**
- **Identified/generic/actual projects**
- **Agnostic to owner/developer of projects**



Situational Assessment – Drivers and Issues	Economic/ Financial Parameters	Load Forecasts	Fuel and Emissions Allowance Price Forecasts	Existing Generation and Transmission Resources	Reliability Criteria
--	---------------------------------------	-----------------------	---	---	-----------------------------

Potential Resource Alternatives

Hydro Projects

Other Generation Resources – Conventional and Renewables

Conservation/ DSM

Transmission

Screening Process

Initial Screening Assumptions

- Use of previous studies
- Resource characteristics – capacity, energy, and storage
- Capital and operating costs
- Quality of available information

- Project viability
- Storage characteristics
- Status of FERC license
- Factor in transmission costs

- Commercial status
- Factor in transmission costs

- Ratepayer Impact Measure (RIM) Test applied to all measures
- Measures that pass RIM Test grouped into programs
- Additional programs added, if required, to meet 20% load reduction by 2020 target

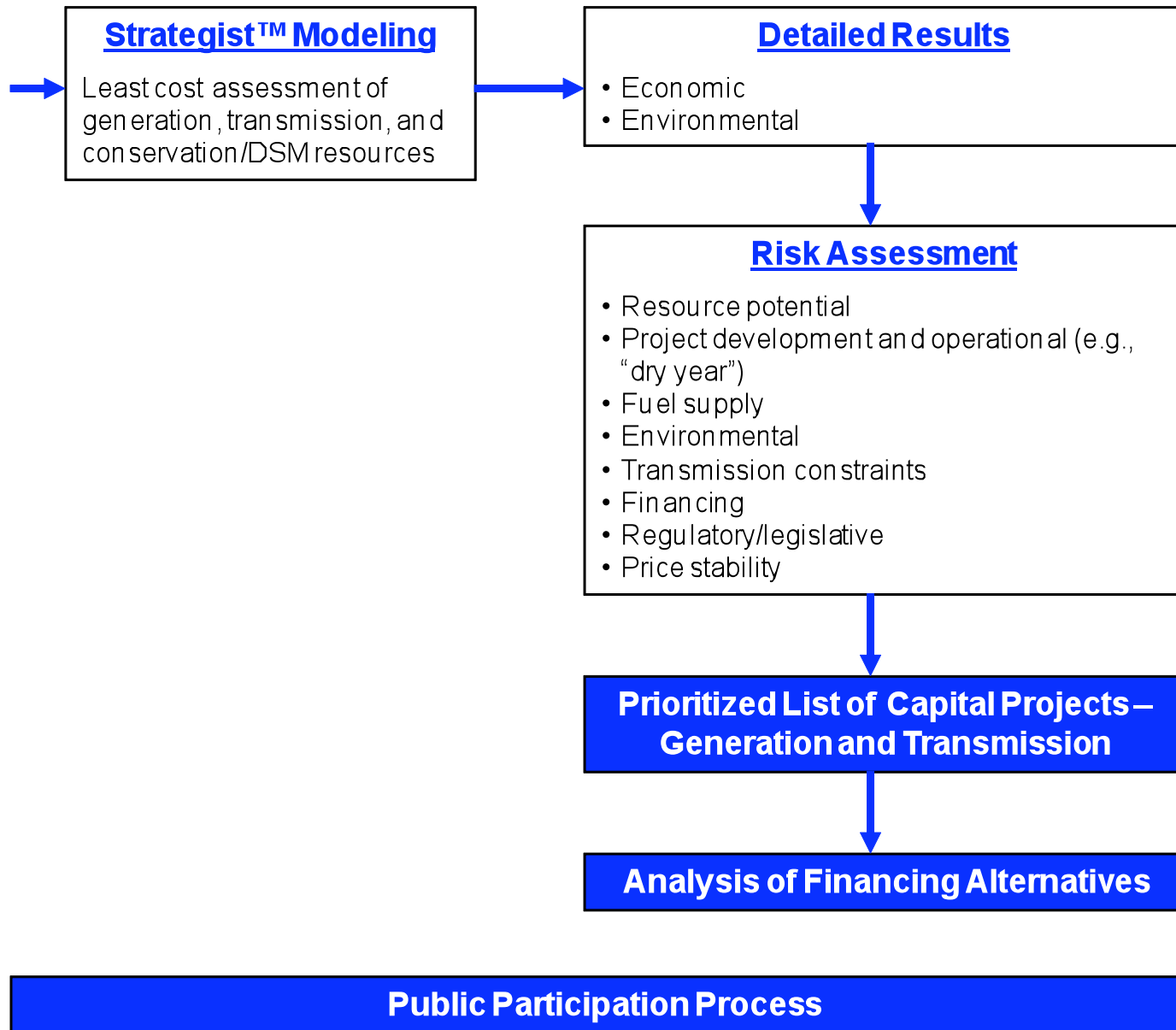
- Location of potential generation resources
- Determine required generation to meet capacity requirements
- Determine transmission cost on \$/MWH basis
- Compare transmission costs to threshold cost of diesel (e.g., 70%)

Refine Input Assumptions for Resources That Pass Screening Process

Strategist™ Modeling

Least cost assessment of generation, transmission, and conservation/ DSM resources

Public Participation Process





Project Team Overview

- **Alaska Energy Authority** – Sponsoring Agency
- **Black & Veatch** – Primary Contractor
- **HDR, Inc.** – Subcontractor
- **Southeast Conference**
- **Sealaska**
- **Advisory Working Group**
- **Regional Utilities**
- **Regional Communities**

Extensive public participation is key element of project.





Situational Assessment – Outside Drivers

- Energy policy legislation
 - Federal
 - State
 - House Bill 306
 - House Bill 220
- Fossil fuel price and availability
- Environmental and land use regulations
- Roadless Rule
- CI RICE
- Natural resources

Situational Assessment – Issues

- Conversion to electric space heating
- Declining populations in communities
- Declining economies in communities
- High cost of space heating
- Rapidly declining excess hydro
- Difficulty in developing new hydro and transmission interconnection projects
- High cost of electricity
- Low levels of weatherization and energy efficiency
- Availability and cost of cost

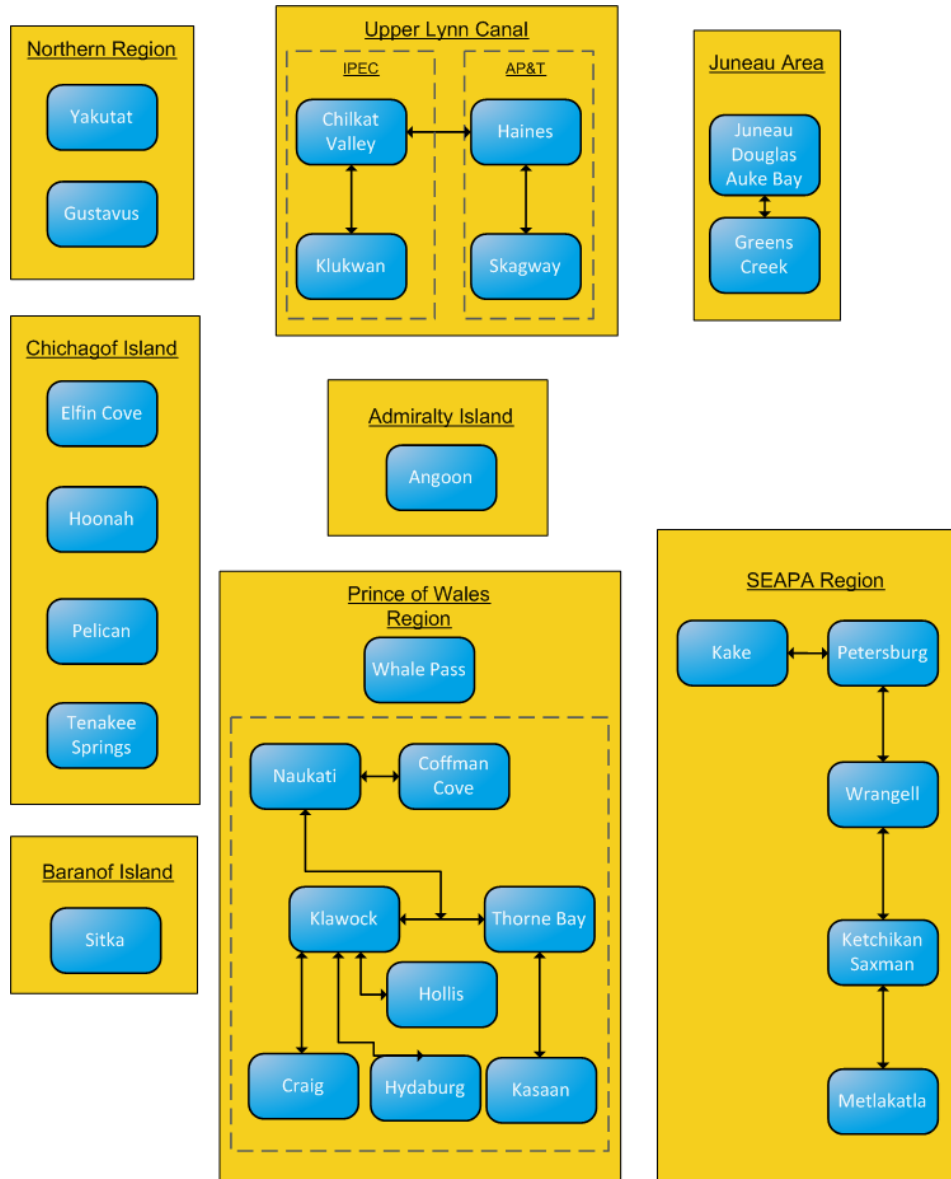
Approach to Specific Issues – Load Forecast

- Sources of information include:
 - Historical loads/existing load forecasts from utilities
 - Department of Labor population forecast
 - Census
 - Information from utilities
- B&V analysis and development of load forecast
 - Reference Load Forecast – continuing existing trends
 - Scenarios
 - High Load Forecast – economic development and EVs
 - Low Load Forecast – DSM/EE and policies to discourage heating conversion

Approach to Specific Issues – Regional Transmission

- Review previous studies
- Identify sub-regions
- Identify potential transmission segments
- Develop cost estimates and operating parameters
- Economic screening based on:
 - Energy requirements of each sub-region, including reserve
 - Determine transmission costs on a \$/MWh basis
 - Compare to threshold cost of diesel generation
- Detailed evaluation
 - Identify potentially viable generation projects and associated interconnections
 - Strategist™ will select economic combination of generation projects and regional transmission segments

Approach to Specific Issues – Regional Transmission



Transmission Planning Regions

Approach to Specific Issues – AK-BC Intertie

- Review existing studies and other documentation
- Complete economic screening of import and export scenarios to determine if Intertie should be included in detailed modeling, including:
 - Export market demand and wheeling charges
 - SE Alaska factors that affect project feasibility
 - Other external factors (outside Alaska) that affect project feasibility

Approach to Specific Issues – Hydro

- **Develop comprehensive list of potential hydro projects**
- **Develop screened list based upon specific criteria**
- **Identify 2061 energy requirements by sub-region**
- **Identify desired profile of local hydro projects by sub-region**
- **Identify potential hydro projects that match desired profile and prioritize by tiers**

Approach to Specific Issues – Alternative Technologies

- Consider alternative technologies, including biomass, wind, solar, and tidal
- Fuel switching options
- Consider commercial status
- Modeling
 - Identify specific projects, and develop cost and operating assumptions
 - Include generic resources where appropriate

Approach to Specific Issues – Conservation/Demand-Side Management (DSM)

- Analysis done at community level – strategies to reduce energy use
- Existing conservation/DSM programs included in Reference Load Forecast
- Additional conservation/DSM programs – include in Low Load Forecast
 - Screen using standard cost-effectiveness tests for each of three groups of communities (high, intermediate and low cost)
 - Develop potential programs based upon screened measures
 - Add enough conservation/DSM programs that pass the Total Resource Cost (TRC) Test to achieve 20% load reduction target by 2020
- Implementation Issues
 - Potential resource - need to gather baseline information
 - Funding alternatives – State, system benefit charge, participants, etc.
 - Delivery mechanisms – AHFC, AEA, regional entity, individual utilities

Analytical approach consistent with other states.

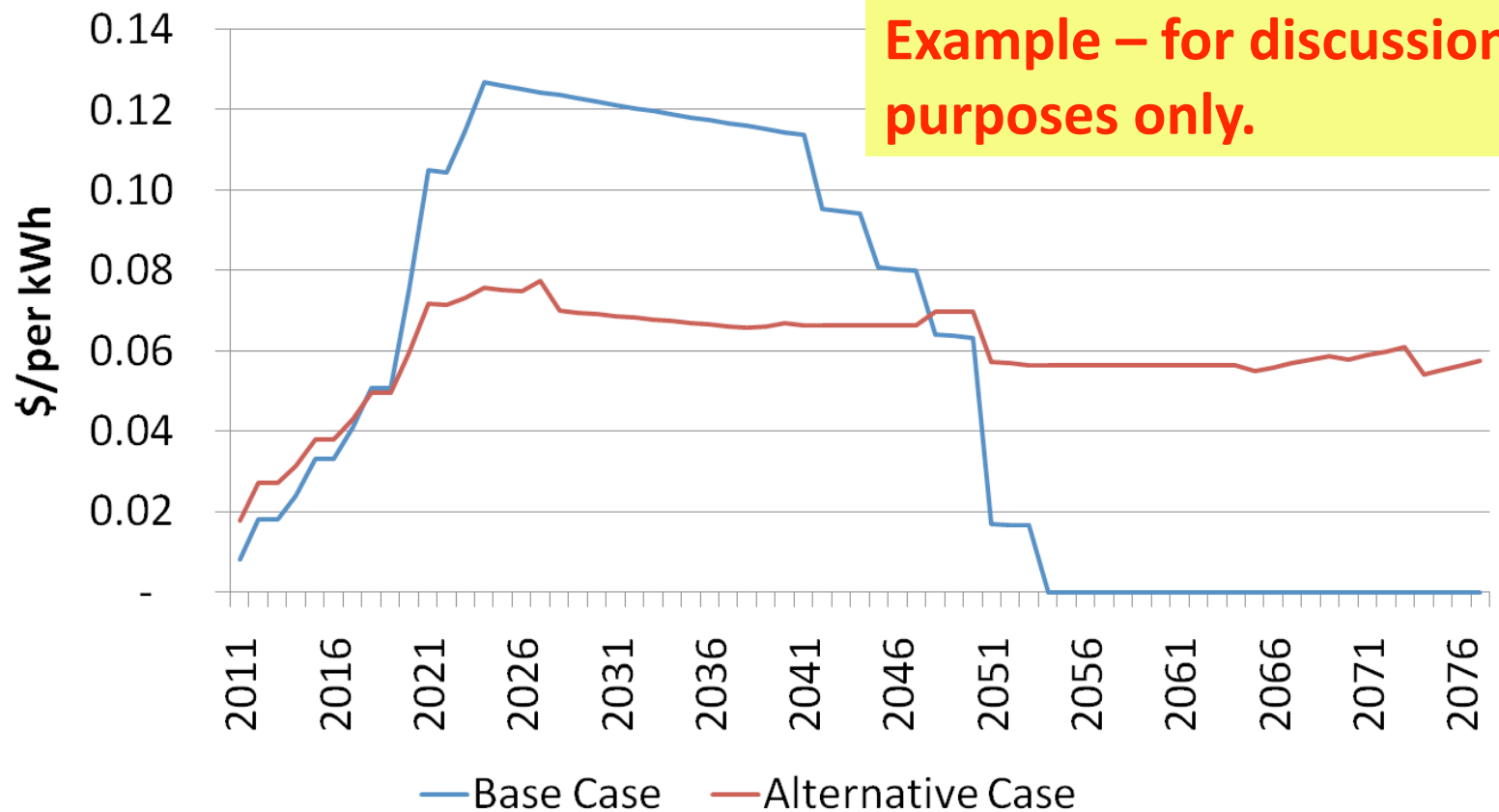


Approach to Specific Issues – Financial Model

- Selection of preferred resources (Strategist™)
 - Include project costs and annual energy
 - Calculate 50-year fixed charge rate
 - Develop list of preferred resources
- Key issues – ability to finance the future and rate impacts
- Evaluate various financing alternatives to levelize/lower costs to Ratepayers, including:
 - State financial assistance (e.g., Bradley Lake model)
 - Repayment flexibility
 - Credit support/risk mitigation
 - Potential interest cost benefit

Approach to Specific Issues – Financial Model

Comparison of Capital Rates for Base Case Scenario and Alternative* Scenario



Source: Railbelt Integrated Resource Plan, February 2010.





Final Report

- **Content**
 - **Summary of Results**
 - **Implementation Risks and Issues**
 - **Conclusions and Recommendations**
 - **Near-term Implementation Plan**
- **Important Dates**
 - **Draft Report – November 2**
 - **Final Report – January 16**

Building a **world** of difference.®

Together

For more information:

Jim Strandberg, Alaska Energy Authority (907) 771-3069 JStrandberg@aidea.org

Kevin Harper, Black & Veatch (425) 427-1652 HarperKM@bv.com

Myron Rollins, Black & Veatch (913) 458-7432 RollinsMR@bv.com



BLACK & VEATCH