Northwest Power and Conservation Council

October 1, 2013

MEMORANDUM

TO: Power Committee

FROM: Charlie Black

SUBJECT: Regional Portfolio Model Redevelopment Report

The regional portfolio model (RPM) is the primary analytical tool used for strategic risk analyses of resource strategies for developing the Council's Northwest Power Plans. RPM was created by Council staff over a decade ago and used for the Fifth and Sixth Plans. The model needs to be updated to make it usable by new Council staff and to bring it up to date with current software technologies and standards. Council staff is proposing to launch a redevelopment effort designed to provide a workable new version of RPM for use for the upcoming Seventh Plan. This will include outsourcing the software redevelopment work to a commercial vendor of power planning models.

At the Power Committee meeting on October 8, I will provide a report on the proposed RPM redevelopment effort. PowerPoint slides describing the proposed approach are attached for your review.

Attachment: RPM Redevelopment Report to Power Committee

851 S.W. Sixth Avenue, Suite 1100
Portland, Oregon 97204-1348
www.nwcouncil.org

Steve Crow
Executive Director

503-222-5161
800-452-5161
Fax: 503-820-2370

Regional Portfolio Model Redevelopment Project

Report to Power Committee

Charlie Black

October 8, 2013

Topics

- Summary
- Situation Analysis
- Purpose and Goals for Redevelopment
- Redevelopment Approach
- Draft Schedule

Summary

- Council staff is preparing to redevelop the Regional Portfolio Model using modern software technology
- The overall RPM strategic risk analysis methodology will continue to be used
- A working prototype is needed in time to use for the Seventh Northwest Power Plan
- Software development to be outsourced to a resource planning model vendor

Summary

- Initial development to focus on the core RPM analytic engine
- Follow-up work will then complete the model input and output linkages, user interface
- Upon completion, intend to make RPM available for use by other parties; perhaps via the software vendor

Situation Analysis

- RPM is the primary model the Council has used to support development of its last two regional power plans
  - Fifth Northwest Power Plan (December 2004)
  - Sixth Northwest Power Plan (February 2010)

Situation Analysis

- RPM methodology
  - Strategic risk analysis ("scenarios on steroids")
  - Differs from typical integrated resource planning models (RPM recognizes lack of foresight)
  - RPM is unique, sophisticated and highly complex

Situation Analysis

- Michael Schilmoeller developed the RPM methodology, and designed and programmed the model's various software components
- Michael was also the primary modeling analyst
  - gathered and reconciled input data
  - set up studies
  - ran the model
  - interpreted outputs
  - drew conclusions
  - presented results

Situation Analysis

- Existing RPM software platform
  - Excel
  - C++
  - Crystal Ball
- While updates have been made to the analytic methodology, the RPM software platform/technology has not significantly changed since about 2003
- Has not been feasible for Council staff to bring RPM software up to commercial capability

Situation Analysis

- RPM Review
  - Three independent experts
  - Completed December 2012, presented February 2013
- Topics and Conclusions
  - RPM methodology: solid approach to resource planning under uncertainty
  - RPM maintenance and enhancement: requires additional staff; suggest greater involvement of subject matter experts; identified enhancements
  - Use of RPM by Council staff: areas for improvement identified (e.g., communication, actionable intelligence)
  - Use of RPM by others: not feasible in current state

Situation Analysis

- Not an existing pool of users prepared for hands-on use of RPM
  - Significant user intervention needed to run RPM
  - New users will need in-depth training
  - Unique combination of specialized capabilities needed to use existing version of RPM

Situation Analysis

- Council not likely to find another staff person with the same breadth and depth of skills
- In any event, depending on one person to bear such a broad scope of responsibilities is burdensome and risky

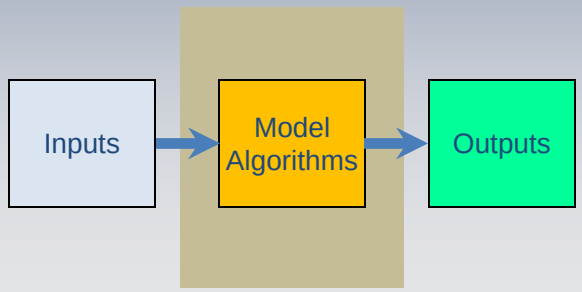
Purpose and Goals for Redevelopment

- Carry forward the overall RPM strategic risk analysis methodology
- Update the model to current software technology
- Improve RPM usability for new Council staff, others

Purpose and Goals for Redevelopment

- Facilitate improvements to the process for using the model, including clarity of communication, actionable intelligence
- Complete a working version of the model by the end of 2014, so that it can be used to support development of the Seventh Power Plan
- Develop data linkages, user interface, other elements

Redevelopment Approach



Initial redevelopment work will focus on core model algorithms

Redevelopment Approach

- Redevelop RPM using modern software technology
- Focus first on core model algorithms
- Implement existing methodology in order of priority, within time available to meet Seventh Plan schedule
- To extent possible, implement new methodologies (e.g., review panel recommendations)

Redevelopment Approach

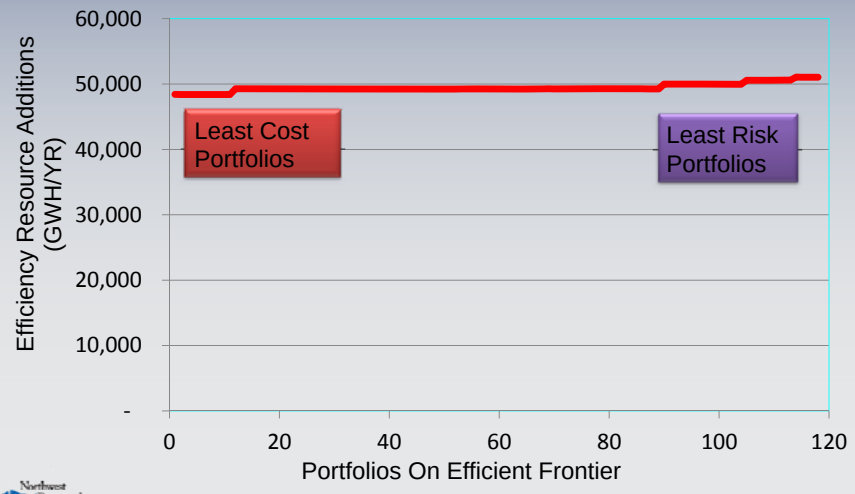
- Outsource software redevelopment to resource planning modeling vendor
- Explore feasibility of trading (some of) the development cost in exchange for granting rights to vendor to market the new model to third parties
- Assign additional Council staff to RPM activities

Draft Schedule

- Compile documentation of RPM methodology, logical implementation – September 2013
- Independent review of model operation, software usability and recommendations for development – October 2013
- Issue RFP for software development of core model functionality –November 2013
- Council decision on contract with developer for new version of core model – February 2014
- Complete development of new version of core model – January 2015
- Analyses using the new version of core model for draft Seventh Power Plan – mid 2015
- Council adoption of Seventh Power Plan – late 2015

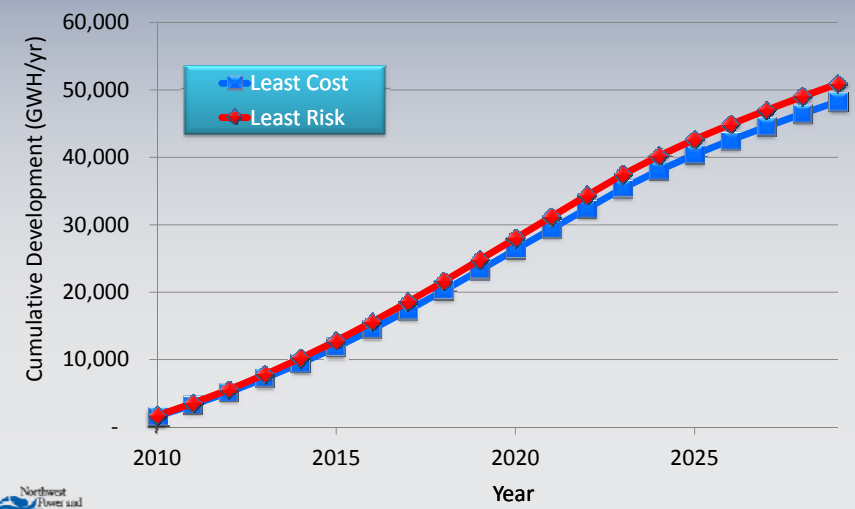
Backup Slides

Least Cost and Least Risk Resource Portfolios Rely Heavily on Energy Efficiency



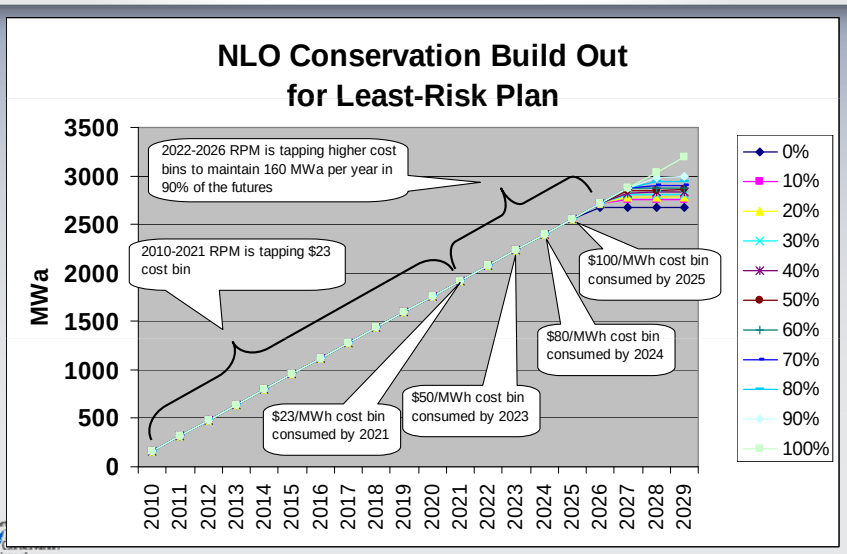
slide 19

Least Cost and Least Risk Portfolios Have Similar Pace of Energy Efficiency Development



slide 20

Discretionary Conservation Does Not Vary Across Futures Until Late in the Plan Period



Lost-Opportunity Conservation Does Not Vary Much Across Futures in Early Years of the Plan