


**NAVIGANT**  
ENERGY

# Regional Portfolio Model


*Summary of RPM Redevelopment Progress*



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Overview of RPM Development Progress

**The Multi-Phase RPM Redevelopment Process is Proceeding as Planned.**

- » **Phase 1: Early Prototype (Complete)**
  - Review of Model Documentation
  - Multi-Day In-Person Meetings with Council Staff to Clarify Requirements
  - Replication of Existing “Core” RPM Logic (minor adjustments where warranted) in the Analytica Modeling Platform
  - Internal Quality Control of Logic and Equations
  - Detailed Comparison of Outputs with Existing RPM
  - Review of Model Logic by NPCC Staff, Dr. Schillmoeller, and Doug Logan
  - Initial Testing of User Interface by Council Staff
  
- » **Phase 2: Priority Enhancements (Currently Underway)**
  - Initial Development of Optimization Logic and User Interface
  - Initial Testing of Solver Engines
  
- » **Phase 3: Final Enhancements (TBD)**

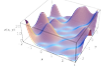



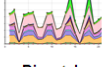







Overview of RPM Development Progress

**Model includes a user interface permitting access to all model inputs, outputs, and model diagrams/equations.**


The screenshot shows a user interface for the 'Regional Portfolio Model' by NAVIGANT. The interface is titled 'Version 1.0 (Phase 1 Deliverable)'. It is divided into two main sections: 'Key Input' and 'Key Output'.  
**Key Input:** Includes a 'Plans' dropdown set to '2990', a 'Model Run Mode' dropdown set to 'All Futures', and a 'Random Futures' input field with a 'Calc' button and a value of '50'. Other inputs include 'Specified Futures' with a 'List' button, 'Lost Opp Market Adjustment' with a 'Determ Table' button, 'Discretionary Market Adjustm...' with a 'Determ Table' button, 'Resource Add'n Options' with a 'Determ Table' button, and 'Resource Add'n Options by MW' with a 'Calc' button. There are also buttons for 'Set Futures' and 'Other Input'.  
**Key Output:** Displays several metrics with 'Calc' buttons: 'NPV of 20-year Cost to Serve (\$ Million)', 'CVA<sub>Rxx</sub>, where xx = 0.90 (\$ Million)', 'Cumulative New Resource Capacity (MW)', 'Total Non-Hydro Capacity (MW)', and 'Cumulative Conservation (MWa)'.  
**Bottom Navigation:** Includes icons for 'Stock/Flow Diagram', 'Other Input', 'Model Details', and 'Other Output'.

Overview of RPM Development Progress

**Most major components of the “core” RPM are already included. Remaining elements are under development.**

 Optimization	 Cost to Serve Region	 Capacity and Generation	 CO2 Emissions
 Dispatch	 Market Balancing	 Price Expectations	 Data Import
 New Construction Criteria	 Conservation	 Renewable Portfolio Stds	 Model Setup/Misc

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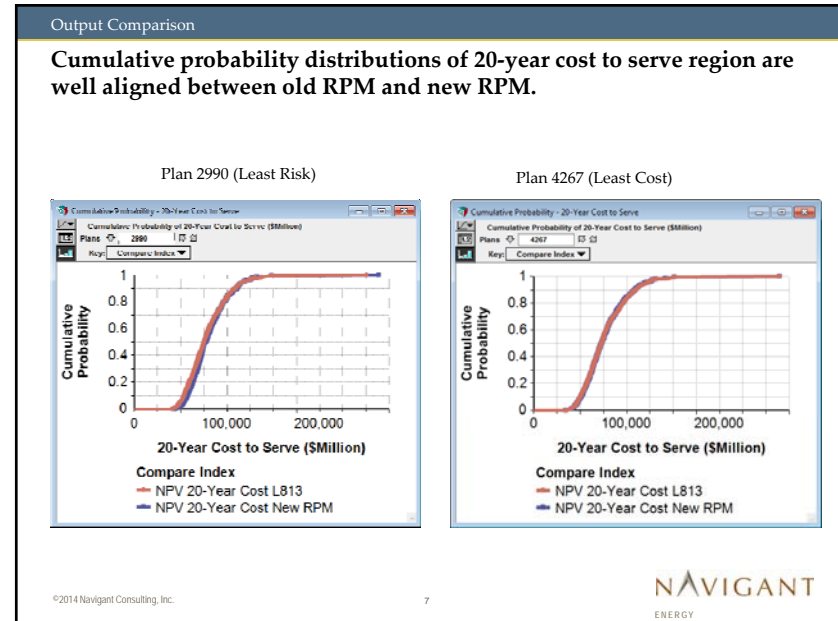
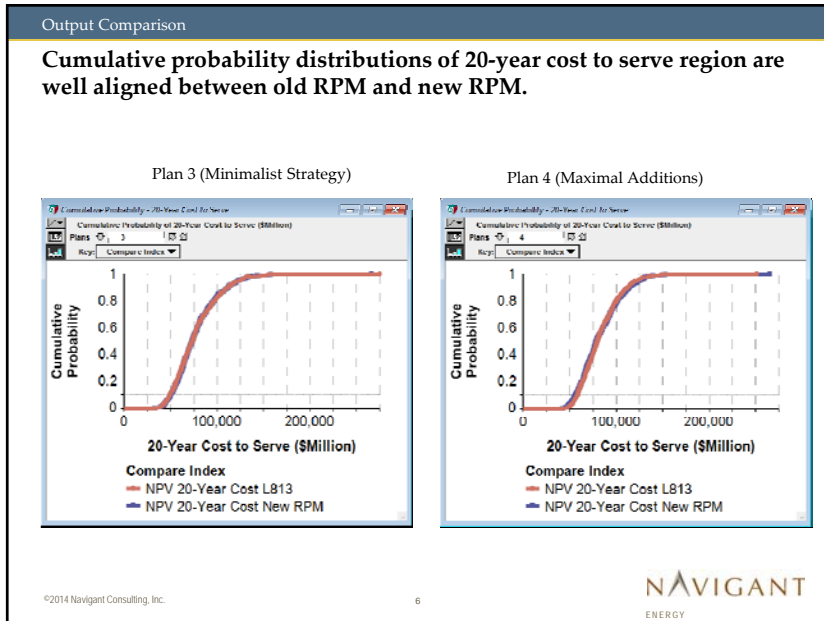
Output Comparison

**Navigant compared output of the new RPM with output from the old RPM to the extent practicable.**

- » Navigant compared output of the old RPM (model L813) with the new RPM for four distinct resource strategies (“plans”) specifically:
  - Plan 2990 (Least Risk Strategy)
  - Plan 4267 (Least Cost Strategy)
  - Plan 3 (Minimalist Strategy – i.e., zero “optioned” resources)
  - Plan 4 (Maximal Strategy – i.e., many “optioned” resources)
- » Key outputs/performance indicators compared included:
  - NPV of 20-year cost to serve (including distribution of outcomes across all futures)
  - Equilibrium electricity prices over time (able to compare for two of the plans)
  - Capacity addition costs over time (an indicator of capacity addition algorithm similarity)
- » A detailed comparison of results was provided in a separate document.

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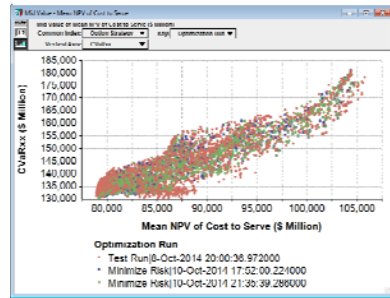




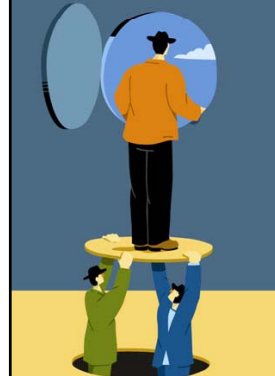
Next Steps

**Navigant is proceeding with Phase 2 model development.**

- » Phase 2 is Well Underway
  - Initial Optimization and Efficient Frontier Logic
  - Tracing of All Optimization Runs
  - Detailed Review/Comparison of Resource Strategies
  - Initial Review of Solver Engines
  - User Interface Control of All Optimization Settings
- » Next Step Enhancements
  - Auto-Generation of "Futures"
  - Demand Response Logic
  - Web Interface for Stakeholder Review
  - Exploration of Distributed Computing
  - Other Minor Enhancements to "Core" Model



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