

BP-20 Rate Case Workshop: Repayment Modeling

July 25, 2018



Overview

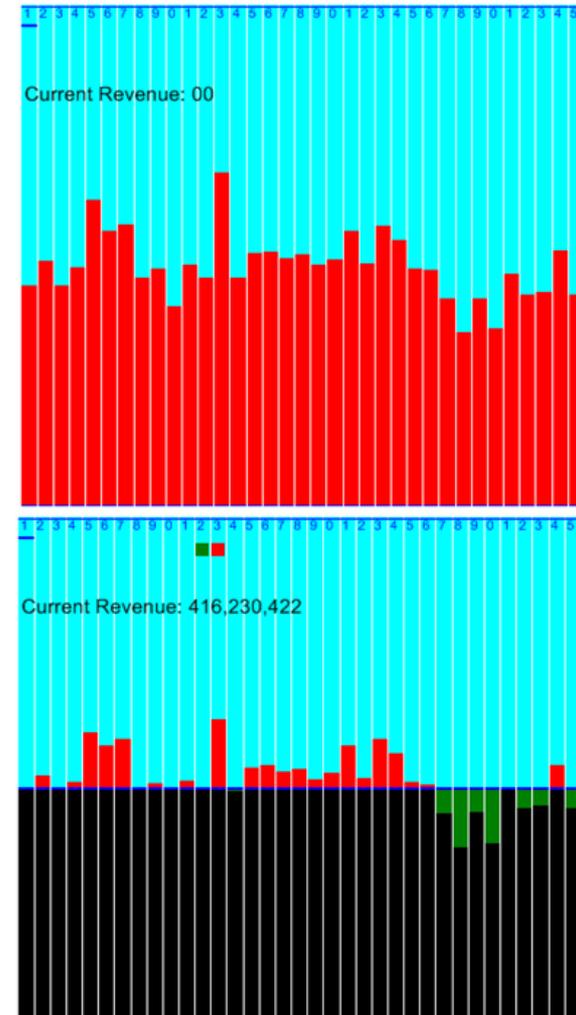
- Model Operations Refresher
- Technical Overview
- Question

What is the Repayment Model?

- The primary purpose of the repayment model is to determine a schedule of Federal principal payments that satisfy all statutory requirements and ensure timely repayment of the Federal investments. It also calculates interest expense that is based on the repayment schedule.
- For the rate case, the repayment model schedules the total Federal repayment for each year of the rate period. BPA will pay, at a minimum, the total amount of Federal debt scheduled in the rate case, more can always be paid. The mix of bonds and appropriations actually repaid may vary from what the model selected.
- Given the variables provided, the model seeks to create level debt service (i.e. interest and principal for both Federal and non-Federal debt) at the lowest possible cost that can be held constant over the repayment period (50 years for Power and 35 years for Transmission).
- Studies are performed separately for Power and Transmission.

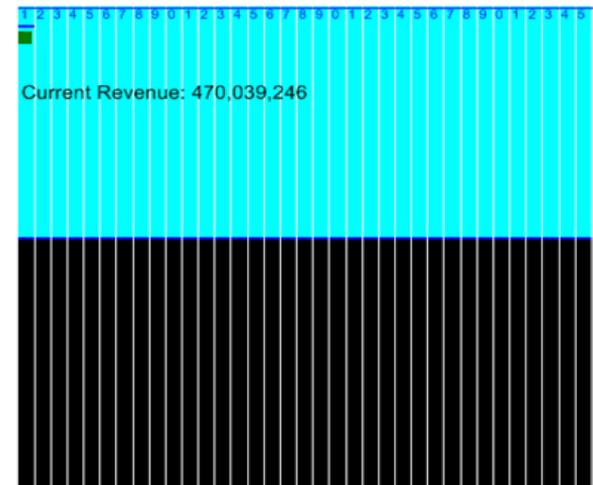
How the Repayment Model Works – Process

- The first repayment year of a study is the current fiscal year, now 2018.
- Each annual study includes all outstanding debt, projected debt through the year being studied, and a set of replacements.
- Non-Federal debt is fixed and considered immovable around which Federal debt is scheduled.
- All Federal debt is collectively positioned at its maturity date which usually creates a rather choppy debt service. This is seen in the top graph on the right in **RED**.
- A starting level of debt service is then determined by the first year in the study, it is labelled “Current Revenue” and is represented by the black line across the screen on the bottom graph.
- Any year with debt service above this line is considered a shortfall, which is shown in **RED**. Any year with debt service below this line has surplus revenue, which is shown in **GREEN**.



How the Repayment Model Works – Process

- The goal is to move the shortfalls into years with surplus revenue by calling some Federal debts into earlier maturities and refinancing others to later maturities.
- For a rate case, the model will prioritize the repayment of Federal debt based on the highest interest rate first consistent with the requirements of DOE Order RA 6120.2.
- If all the outstanding debt is unable to be paid within the current revenue level, the level is increased and the process continues.
- After moving Federal debt and leveling the debt service over the required time period, the study moves onto the next repayment year and repeats the process with the debt for that year.
- The new set of debt is the same as the set from the previous year less any payments made in that study year (i.e. 2018), any new projected debt (i.e. 2019), and a new set of replacements.
- While many of these parameters are set for rate case purposes, they can be adjusted to analyze a wide variety of debt management actions.



How the Repayment Model Works - Issuance Dates and Interest Rates for Federal Debt

- As detailed in the July 25th 2016 workshop, Bonneville would change its modelled procedures to align to any changes in its Federal debt issuance practices.
- In 2017, Bonneville began issuing the majority of its Federal debt in the last three months of the fiscal year.
- This practice is now modelled in the repayment study to ensure that projected interest expense lines up with actuals more closely.
- Bonneville continues to use its official interest rate forecast, as detailed in the Revenue Requirement Documentation for the Initial and Final Proposals.

How the Repayment Model Works

Maturities for Projected Federal Debt

- Step 1: Run base repayment study. All projected debt is modelled to be issued to the maximum term allowable under the Treasury MOU and no historical debt is refinanced.
- Step 2: Review the results for the first study year. Any critical year, a year without any discretionary debt repayment, is reviewed to determine if it is driven by historical or projected debt.
 - If driven by historical debt, some of the debt due in that year will be targeted to be refinanced.
 - If driven by projected debt, the projected debt will be placed in a different year with discretionary payments.
- Step 3: Modify the maturities of the projected debt. The first issuance is placed in the earliest year in which any projected debt is called in the study. The remainder of the debt will be issued past that point in accordance with the amount of discretionary payments made in a particular year.
- Step 4: Rerun the model and repeat steps 1-3. Continue to repeat the process until a critical year no longer appears or is seen in the last few years, making it unavoidable.

Technical Overview

The Dynamic Debt Repayment Modelling (DDM) system is a multi-tier system consisting of:

- Web Application frontend running in Internet Explorer 11.
- Web Server running IIS on Windows 2008 Server.
- Application server running the model service on Windows 2008 Server.
- Database Server running MS-SQLServer.

Additionally DDRM relies on these additional systems:

- DBC Debt Manager Sybase SQL Anywhere Application for bond data system of record.
- Microsoft (SSRS) SQLServer Reporting Services for study results aggregation and presentation.
- Microsoft Active Directory for Authentication and Authorization.
- Microsoft Exchange for automated email generation.
- BPA People Web Service for person and department data.
- Network file system for application logs.

Technical Overview

