As part of Liberty-Empire's joint filing with Staff regarding its 2019 Triennial IRP filing, Liberty-Empire agreed to perform two additional modeling runs to address Staff's alleged deficiencies ("AD") 3 and 10.

To address AD3, Liberty-Empire agreed to re-run its DSM screening analysis by adjusting the avoided capacity value to be equal to zero prior to a capacity need arising for Liberty-Empire, and equal to ABB's capacity price forecast after a capacity need arises. Liberty-Empire also agreed to perform new portfolio modeling on the resulting RAP and MAP outcomes with different avoided cost assumptions.

To address AD10, Liberty-Empire agreed to perform additional portfolio analysis that delays all utility-scale and distributed solar resources that are installed prior to 2027 and instead build those resources in 2027. Liberty-Empire agreed to perform this analysis for the following plans: Plan 2, Plan 2B and Plan 4.

Liberty-Empire has completed both of these additional modeling exercises. Liberty-Empire has provided the following attachment summarizing the results of its DSM screening: "AD3 v IRP DSM Results.xlsx." Liberty-Empire has provided the following attachment detailing the results of these runs: "Results Comparison_AD3_AD10.xlsx." The results of these additional modeling runs are summarized below.
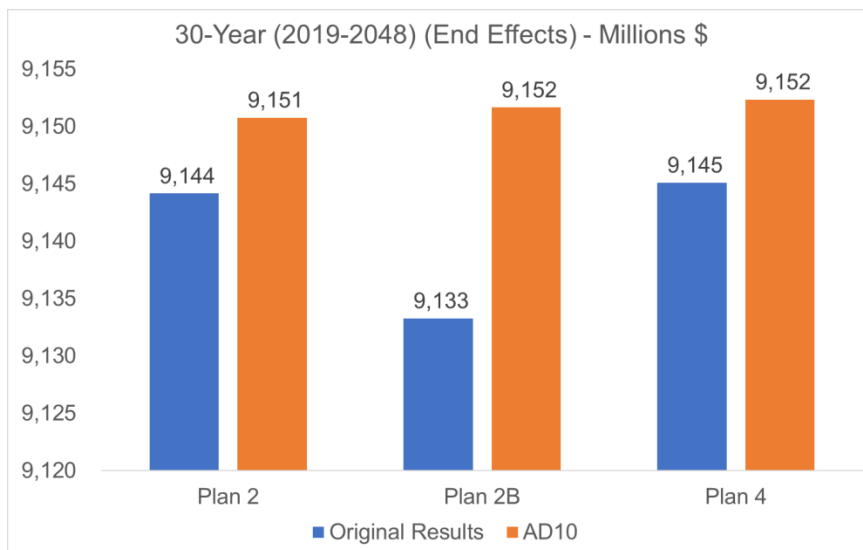
AD3

AEG has updated its screening analysis to adjust the avoided capacity cost to equal zero prior to 2027 (when a capacity need for Liberty-Empire arises) and equal the ABB Capacity Price forecast thereafter. In the new DSM screening results provided by AEG, the peak demand, total energy, and cost of the selected DSM programs were **slightly lower** than in the original IRP DSM results in the 2020-2023 time period. Over the long term, the DSM savings and program costs converged with those from the IRP. As a result of this, the impact of the revised DSM portfolios on total portfolio costs was very minimal. In Liberty-Empire's base case, contract costs associated with DSM *decreased* by about $590,000 (reflecting lower DSM program costs) on a 30-year NPV basis, while net market purchases *increased* by about $800,000 (due to higher energy obligations as a result of the lower DSM volumes). This creates a net **increase** in NPV of about $200,000 across all RAP portfolios. The increase for the MAP portfolios was slightly lower, totaling about $120,000 in NPV effect over the 30-year period. These differences can be found in the summary tabs in the accompanying file: "Results Comparison_AD3_AD10.xlsx".

Across the various stochastic runs, the differences are also very small, and the difference in expected value between the original portfolios and the AD3 portfolios is about $300,000 more expensive on a 30-year NPV basis.
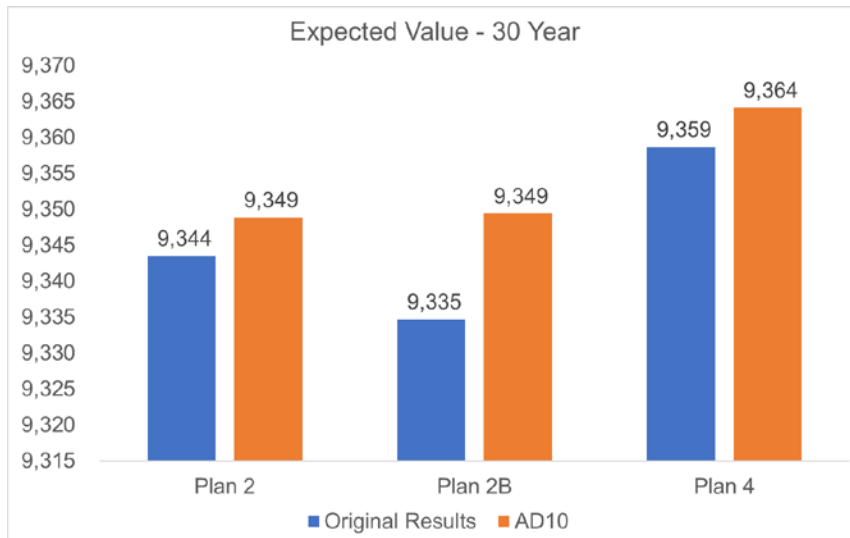
AD10

Liberty-Empire ran new versions of Plans 2, 2B and 4 that delay all solar additions to 2027. This includes both utility-scale and distributed solar capacity. As expected, these new portfolios are more expensive than their original counterparts, in both the base case and on an expected value basis.[1] Cost differences for the AD10 portfolios range from $6.6M to $18.4M in the base case, and from $5.3M to $14.7M for the expected value.

30-Year (2019-2048) (End Effects) - Millions $

	Original Results	AD10
Plan 2	9,144	9,151
Plan 2B	9,133	9,152
Plan 4	9,145	9,152

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[1] Expected value represents the probability-weighted NPVRR of the stochastic iterations.

Expected Value - 30 Year

The new AD10 portfolios forego lower-cost, tax-eligible 2023 solar for higher cost solar in 2027. The differences vary by portfolio – Portfolios 2 and 4 add less 2023 solar than Plan 2B, so the cost difference for Plan 2B is greater. Expected value differences are slightly lower than the base case because there are some stochastic endpoints where delaying solar is slightly beneficial, particularly when fuel and power prices are low and there is no carbon price.