PowerSimm Simulation Quantity

- IRP used 10 Simrep due to faster compute time vs 100 Simrep: the difference is ~0%
- Trying to be responsive to GDS memo and staff summary Although not described in the IRP, the decision was made due to small difference
- Trying to have a decision ahead of time for next time to better plan; make a group decision prior to modeling for next IRP
- Does it change the risk premium: yes, it does catch tail end events better but doesn't change resource selections
- Did the storage change? 2023 main scenarios did use 100, but nothing else
- What could sway the results from 10-100 simulations? Stochastic analysis will report the average, so likely not a big difference
    - Market prices potentially could sway data or VER are based on historical prices, but will smooth out to the average
    - Dump energy or emergency purchases: Not totally true of operations
    - Transmission constraints: No on system constraints, but there is off system constraints
        - NWE transmission also serves BA so can be more complicated
- GDS concerns on anchoring studies and whether they could be traced back
    - Can cut down on time and memory consumption by utilizing anchoring
    - Hard to trace back from a UI perspective: working with Ascend to try to show what module information was saved
    - GDS concern was not being able to replicate studies
        - GDS was given same access as ETAC: greater collaboration could've resulted in a better set-up for GDS
    - Load shapes: the load item is the same for each scenario
        - The load sim is always anchored to the first simulation
        - If it wasn't anchored you would get different load shapes
        - Is weather also anchored? Yes
        - Everything in sensitivities is anchored to the base case, except the variable that is changed
        - Renewables also don't change throughout the modeling
            - Caveat: new candidate resources will change
- Risk Premium – 100 simulations are required for these studies so these are still in draft

        - The risk premium is the difference between the simulation median and the average of the upper half of the rest of the simulations
            - The logic behind is you report the average: if your average is wrong and you report the average; how much are you going to be off
            - Some report the 95 percentile as the Risk Premium
            - Did not report this in the IRP: Is the risk premium helpful? If you do RFP how do you want to make the selection; on an average or on a risk premium? If you aren't choosing resources on a Risk premium is it really helpful?
            - NWPCC: Doesn't do risk premium like this More on a resource adequacy that they are looking at than a financial look
            - Risk premium mostly came from market sales – which is a risk
            - Transmission constraints in this IRP vs the last IRP constraining market sales and not constraining transmission
            - This IRP: tried to show if market sales was half, would we select the same resources?
            - Small risk premium over 20 years if you annualize it
            - Can't anchor a 10 simrep study to 100 simrep study; But can anchor a 100 simrep study to a 10
    - Resource Adequacy – This is local resource adequacy; WRAP is still our regional planning metric
        - Graphs and Tables show – P99/P95/P50/P5
        - Winter 2027/2028 is first season showing a deficit (which is why utilizing 2028 graph)
        - LOLE counts number of shortfall events not magnitude
        - LOLH counts duration in which it occurs
            - Shortfall compares load at that hour and resources generated
            - PRM would be built from this data (WRAP is currently providing WRAP so this would show how much we are relying)
            - Contingency reserves held out in PCM but not necessarily in this analysis
        - EUE displays magnitude of events
            - Even though we are short in 2028, resources couldn't be built in IRP modeling until resources could be selected in 2030
        - Are we comfortable relying on WRAP?
            - Difficult for long term planning

- PRM/Participants etc are changing in the short term
- There are some concerns for long term planning with all the changes that come
- Okay as long as other entities are still binding, others are still in the market, and transmission is available
    - If entities are coming up short or not going binding than there is issues
- How much regional do we want to rely on? What is the assumption? How do we find the balance?

- Demand Response – working through how to incorporate this in next IRP
    - DR can be included in a RFP; must include all the details to evaluate consistently against other resources
- Other Topics:
    - Modeling Parameters: trying to get those all listed out and described
    - PowerSIMM access and verification: working on some products for that
        - More detailed and updated description on how each module works
        - Traceability for each module to audit
        - Screenshot inputs to show how things are input and how it links to excel files
        - DRAFT that may or may not be included: what is an audit protocol for the software
            - Helps avoid miscommunication
    - Load Shapes: will be provided
    - Load Forecast regression formulas and back casting: should've included in the beginning as requested in 2023 comments
    - Candidate resource RR: should've included in the beginning as requested in 2023 comments
    - Shooting for Nov 30, 2026 to submit final IRP: There will be a redline and in the letter will call out the new sections added in response
- Is there anything we missed for 2026? Thoughts?
    - Putting something in DRAFT format to add to our action plan
        - Adding screenshots for documentation
        - Study 2 module auditing document
        - Some reports that show the variability of what was modeled vs what was input

        - Ex) weather or load
- 2027 ETAC
    - Trying to work on getting the new team put together
    - Applications will be forthcoming
    - Still do stakeholder working group
    - Likely first new meeting in jan/feb 2027
    - Thoughts on what to do differently next time?
        - Game plan ahead of time would be helpful
        - How to get the word out to others who may want to be involved
        - There may be a lot of upfront planning – a roadmap on how to execute
            - Create better efficiency
            - More involvement throughout instead of the end
            - What questions are we trying to answer
                - More integration between supply planning and transmission planning at NWE to help solve those issues
                - Montana Energy Strategy – opportunities to run some of these things in parallel and leverage these processes to help aid and get public input
                    - Timeline on Energy strategy: TBD