

# VER QC Calculations ENLR & Exceedance

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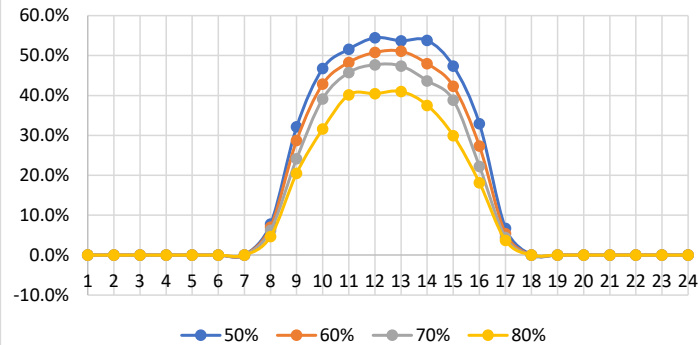
# Approach

- ✦ **Calculated VER QCs using ENLR and exceedance methods**
  - Based on large 2017 to 2020 solar and wind dataset made available by PG&E
  - 2021 data is available but was not included in the data
  - Contains some spurious data – e.g., random solar MWs after dark
- ✦ **All data normalized against interconnection capacity (not installed capacity)**

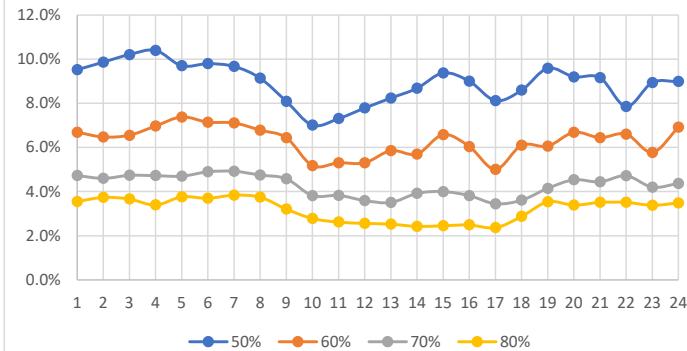


# January

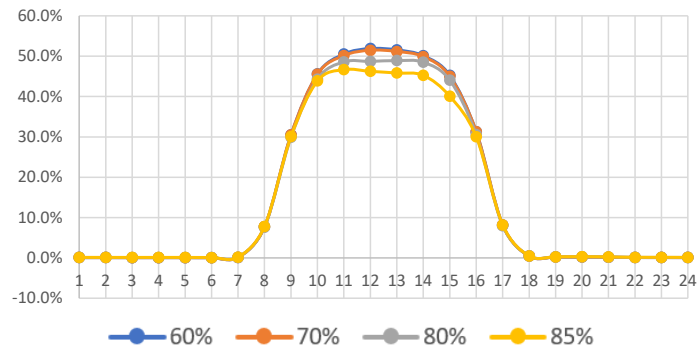
Solar QC, for January, using Exceedance Method



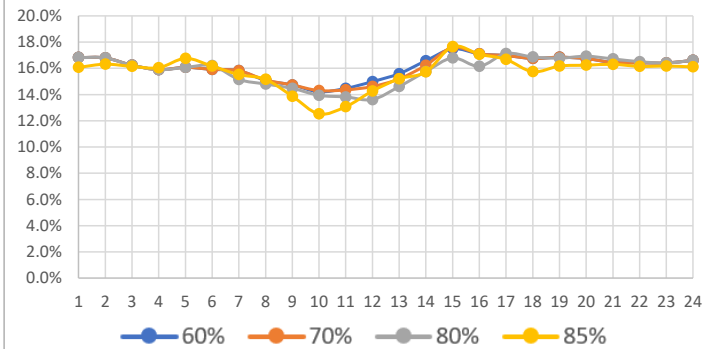
Wind QC, for January, using Exceedance Method



Solar QC, for January, using ENLR Method



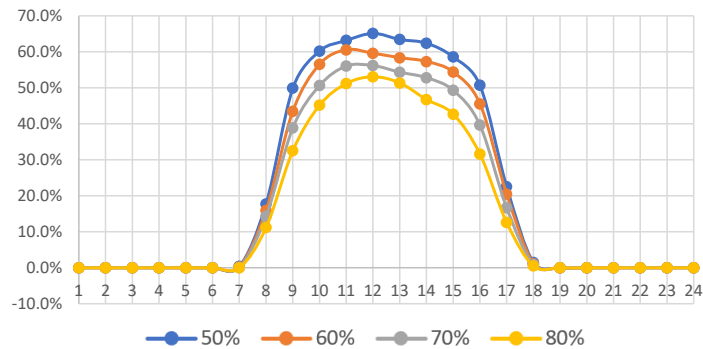
Wind QC, for January using ENLR Method



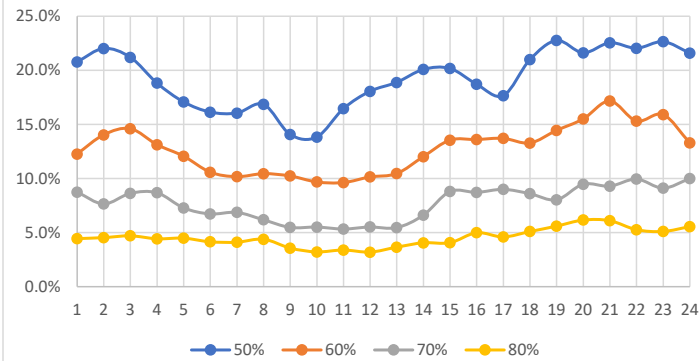


# February

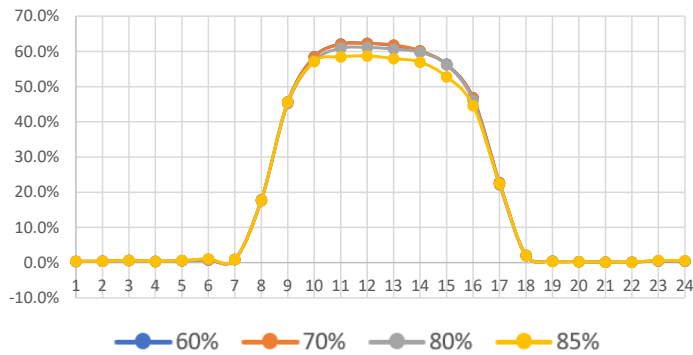
Solar QC, for February, using Exceedance Method



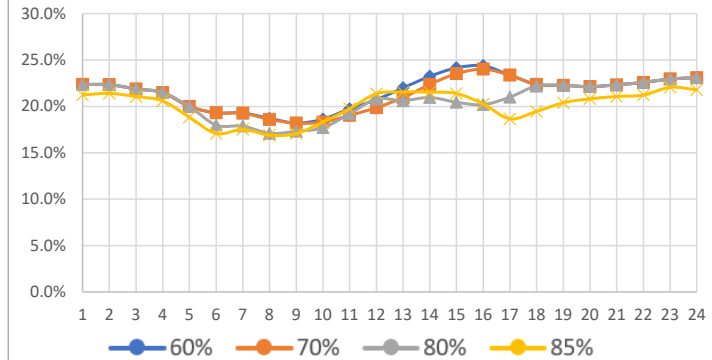
Wind QC, for February, using Exceedance Method



Solar QC, for February, using ENLR Method



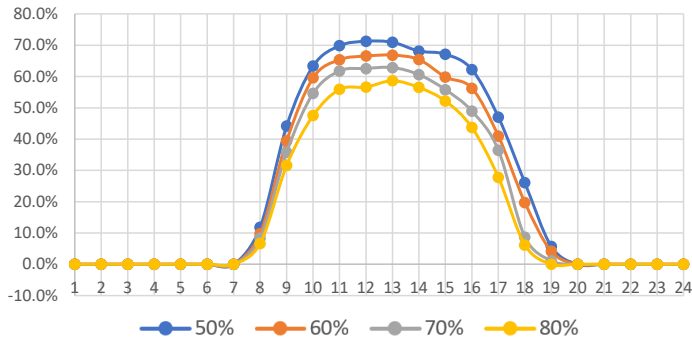
Wind QC, for February, using ENLR Method



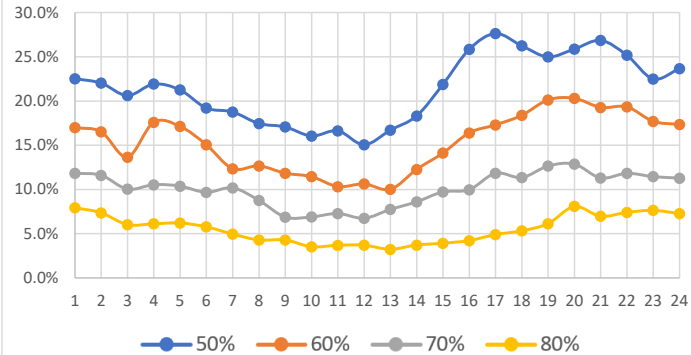


# March

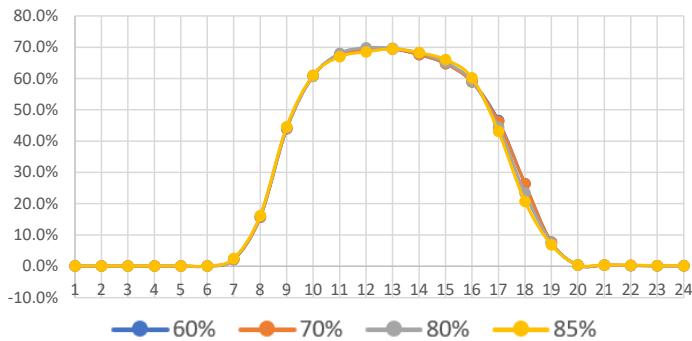
Solar QC, for March, using Exceedance Method



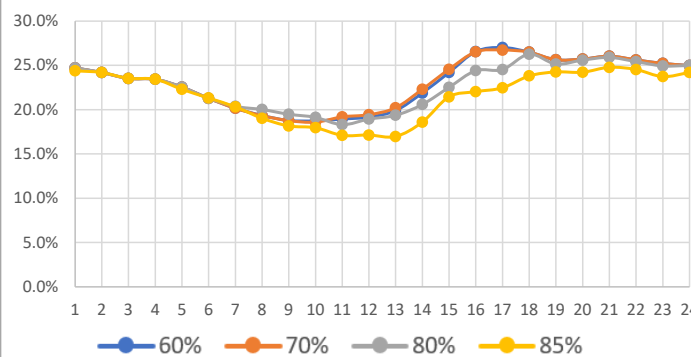
Wind QC, for March, using Exceedance Method



Solar QC, for March, using ENLR Method



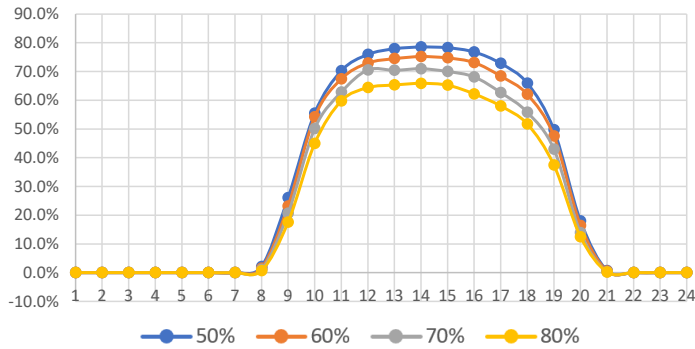
Wind QC, for March, using ENLR Method



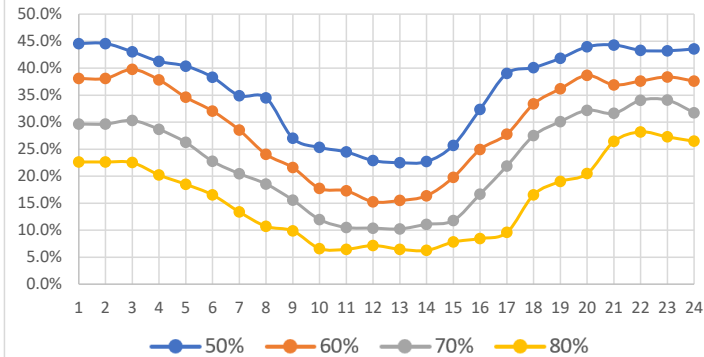


# April

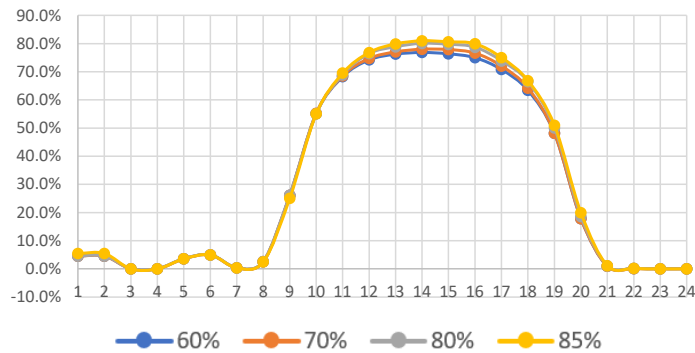
Solar QC, for April, using Exceedance Method



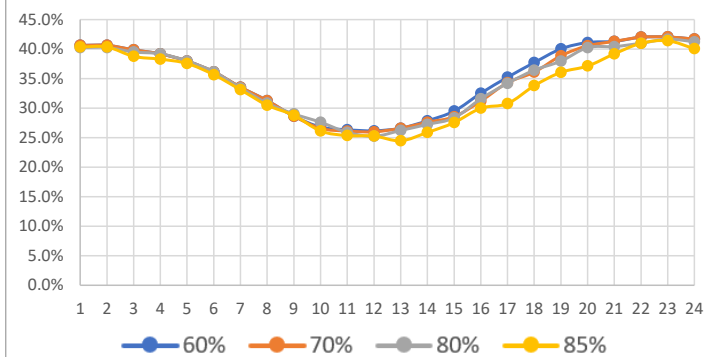
Wind QC, for April, using Exceedance Method



Solar QC, for April, using ENLR Method



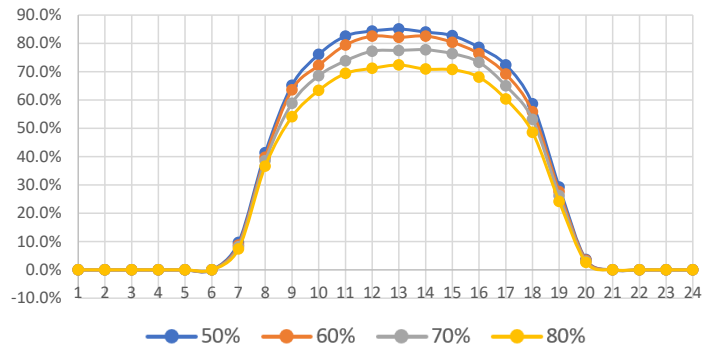
Wind QC, for April, using ENLR Method



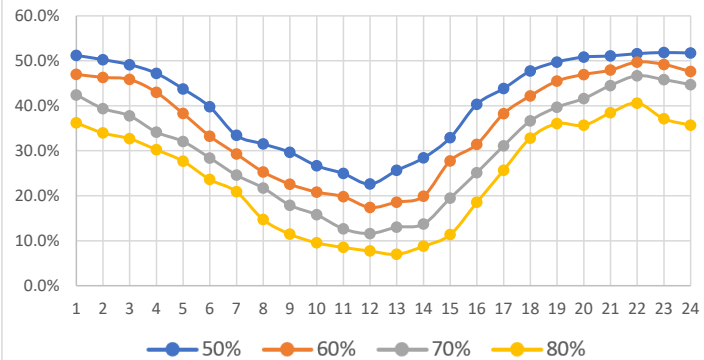


# May

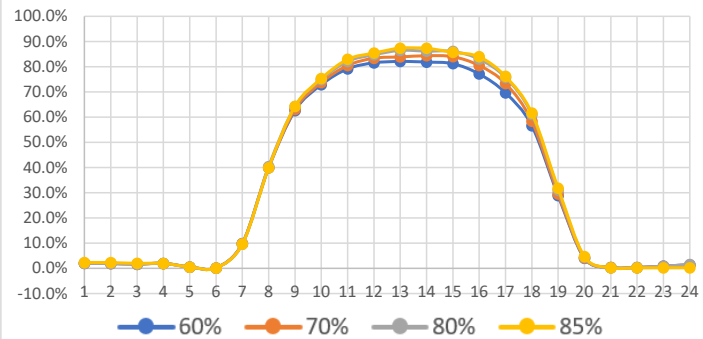
Solar QC, for May, using Exceedance Method



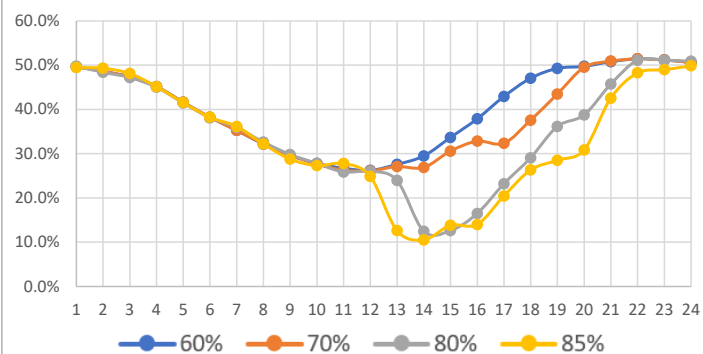
Wind QC, for May, using Exceedance Method



Solar QC, for May, using ENLR Method



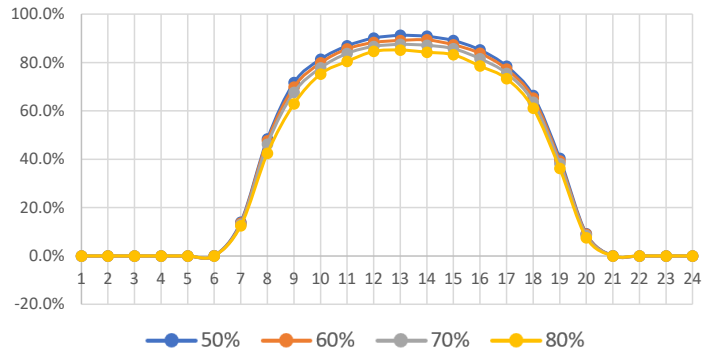
Wind QC, for May, using ENLR Method



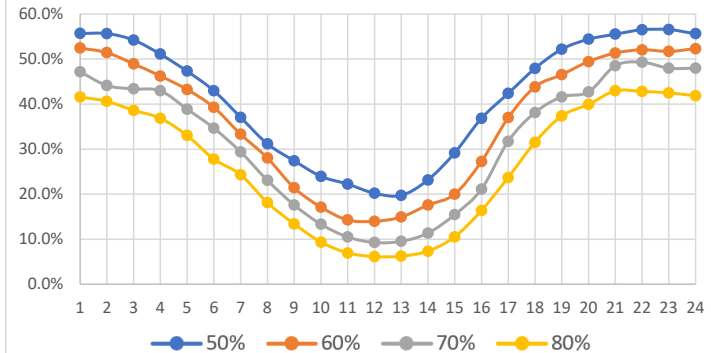


# June

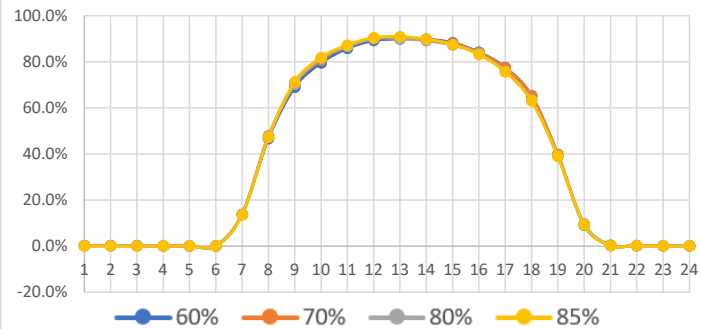
Solar QC, for June, using Exceedance Method



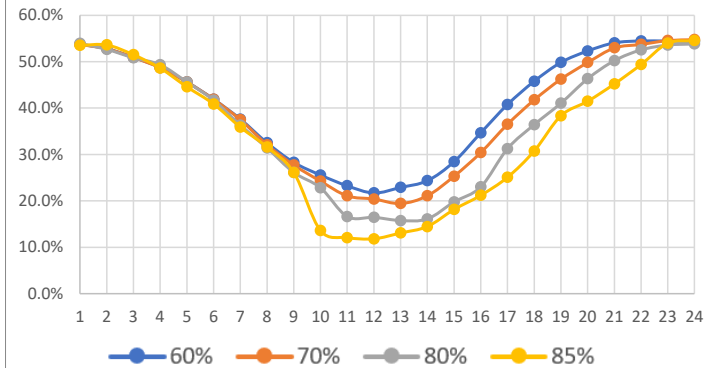
Wind QC, for June, using Exceedance Method



Solar QC, for June, using ENLR Method



Wind QC, for June, using ENLR Method

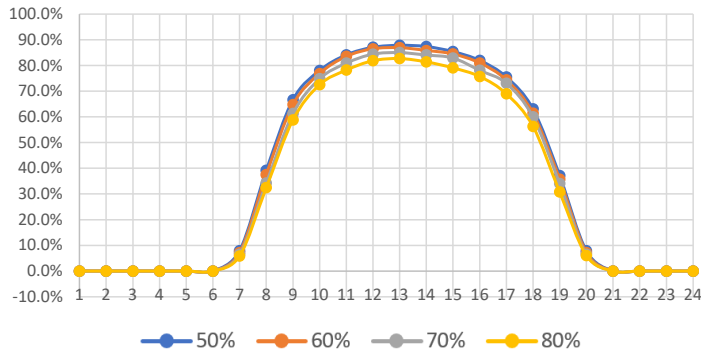




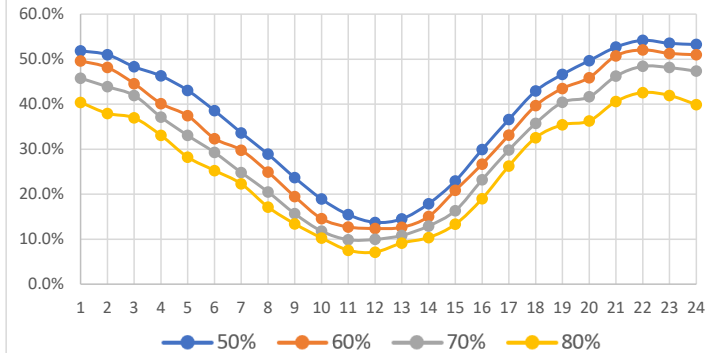


# July

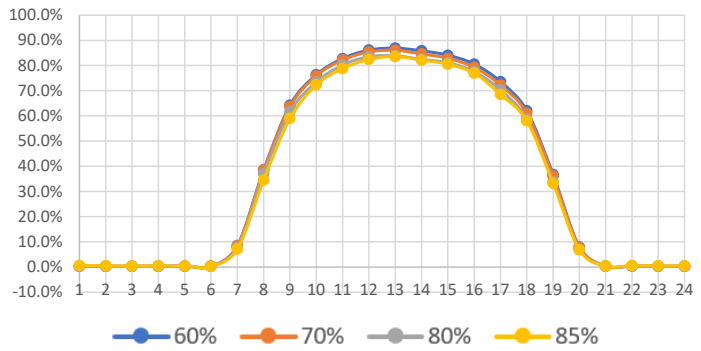
Solar QC, for July, using Exceedance Method



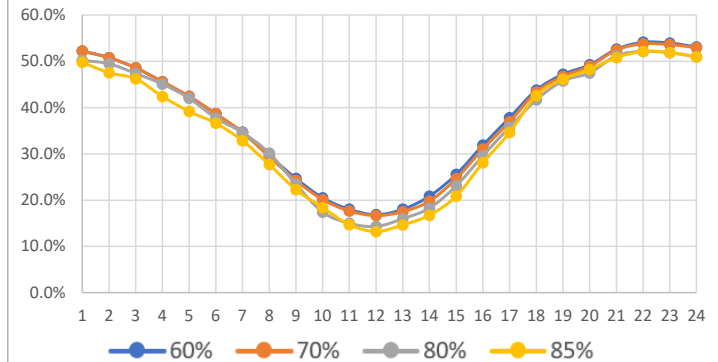
Wind QC, for July, using Exceedance Method



Solar QC, for July, using ENLR Method



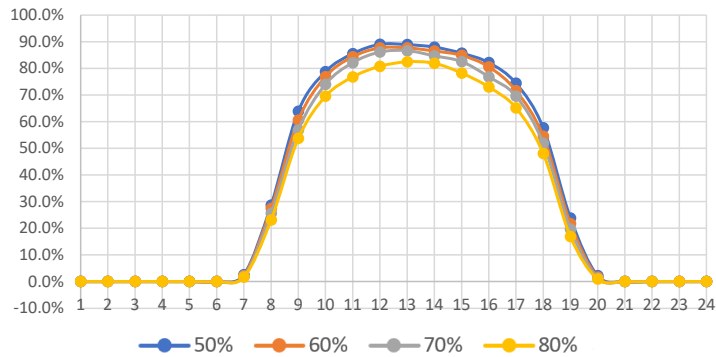
Wind QC, for July, using ENLR Method



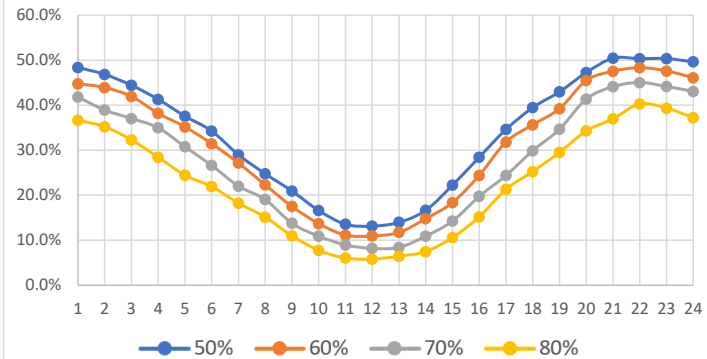


# August

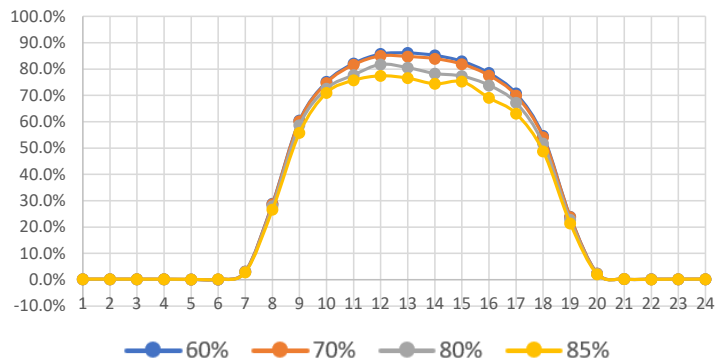
Solar QC, for August, using Exceedance Method



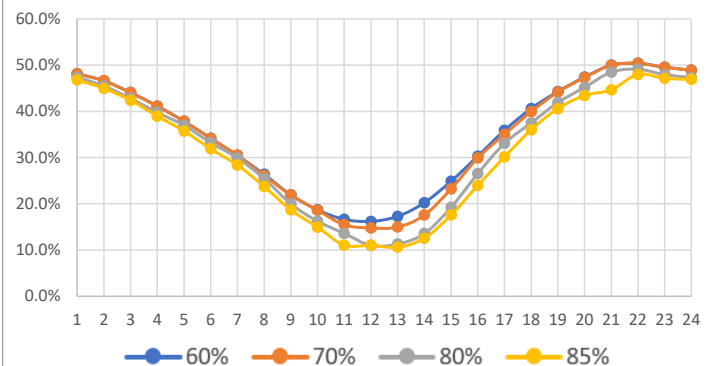
Wind QC, for August, using Exceedance Method



Solar QC, for August, using ENLR Method



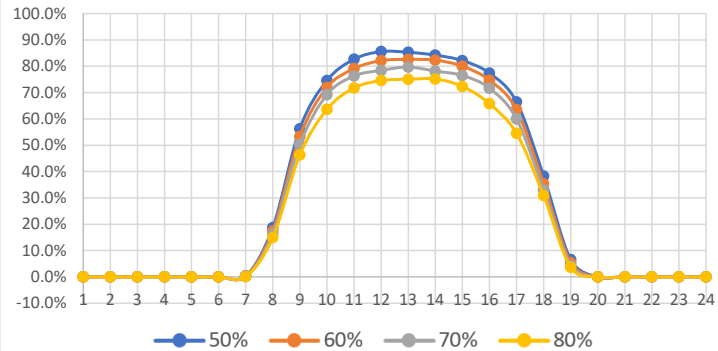
Wind QC, for August, using ENLR Method



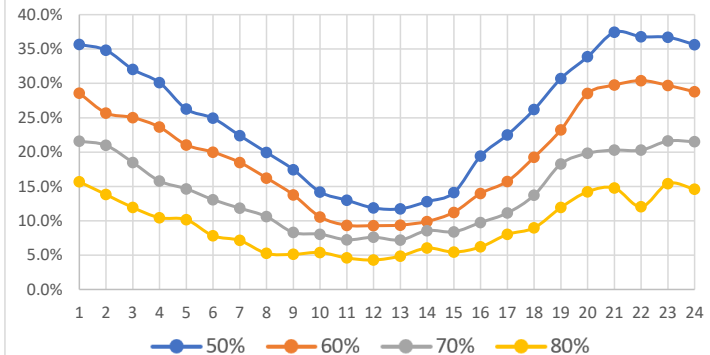


# September

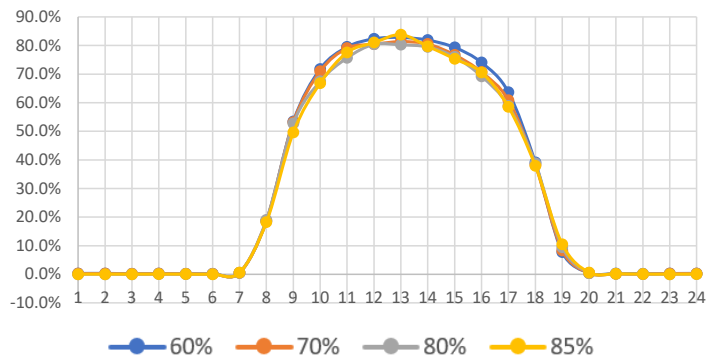
Solar QC, for September, using Exceedance Method



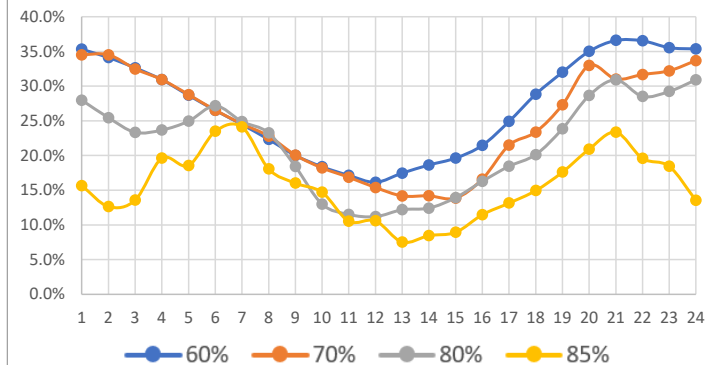
Wind QC, for September, using Exceedance Method



Solar QC, for September, using ENLR Method



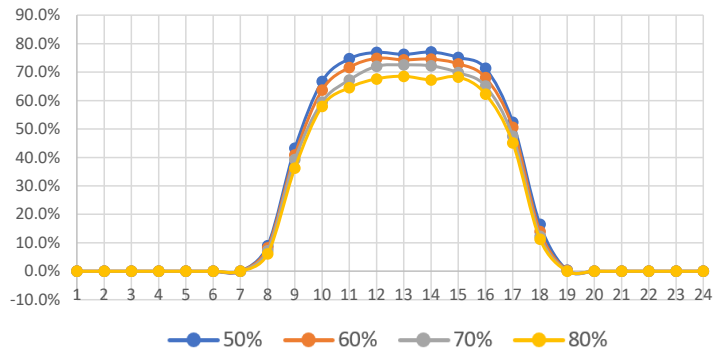
Wind QC, for September, using ENLR Method



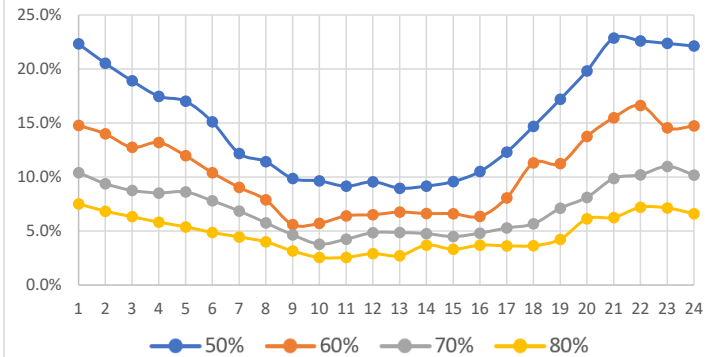


# October

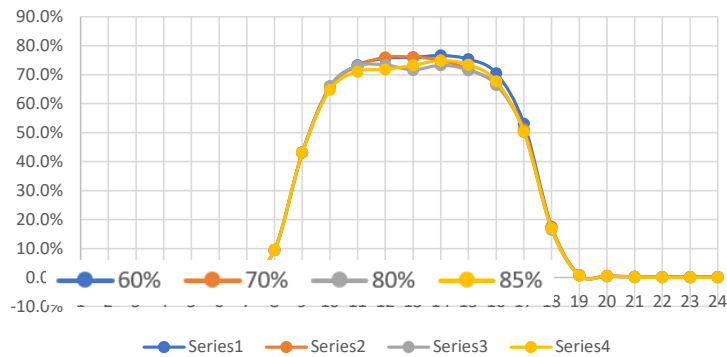
Solar QC, for October, using Exceedance Method



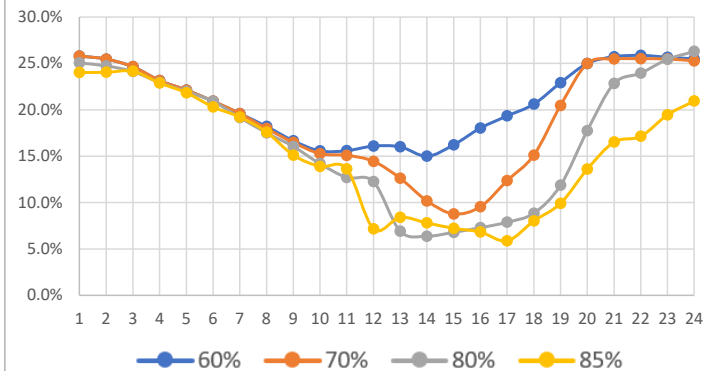
Wind QC, for October, using Exceedance Method



Solar QC, for October, using ENLR Method



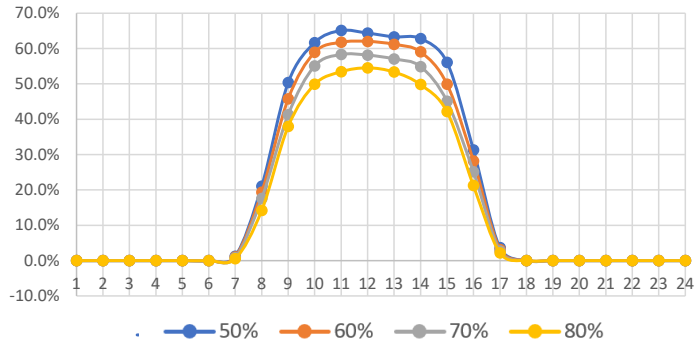
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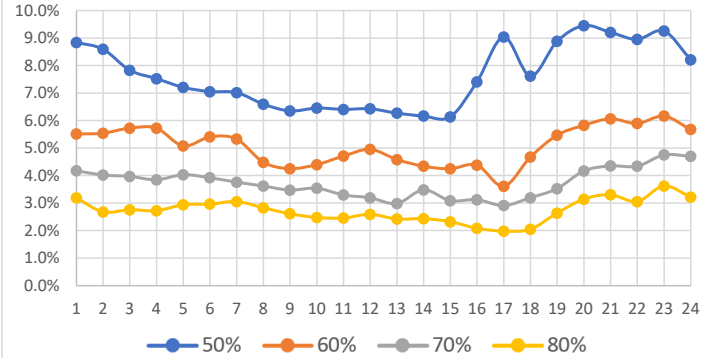


# November

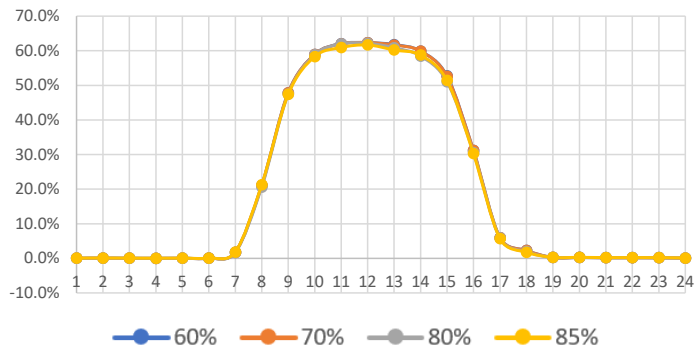
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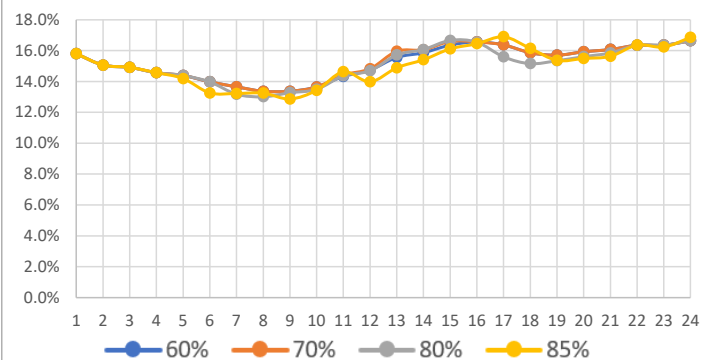
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Solar QC, for November, using ENLR Method



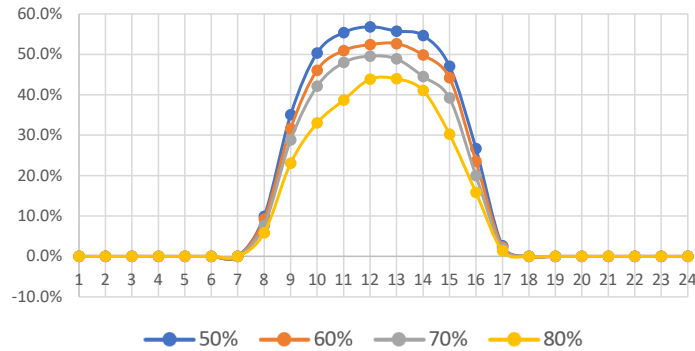
Wind QC, for November, using ENLR Method



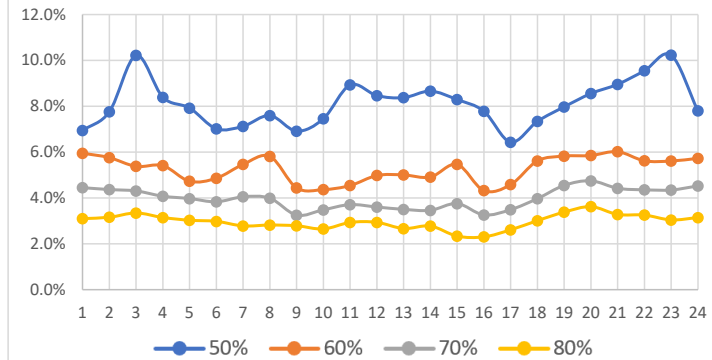


# December

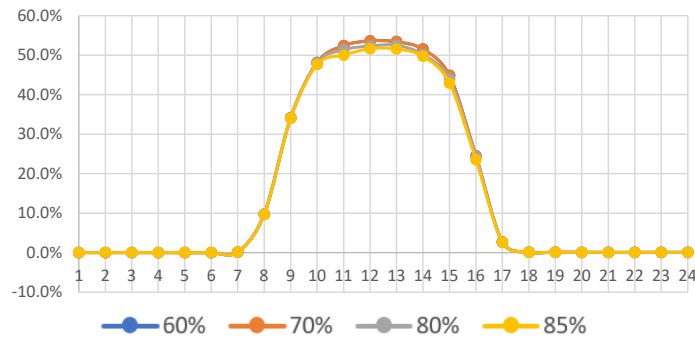
Solar QC, for December, using Exceedance Method



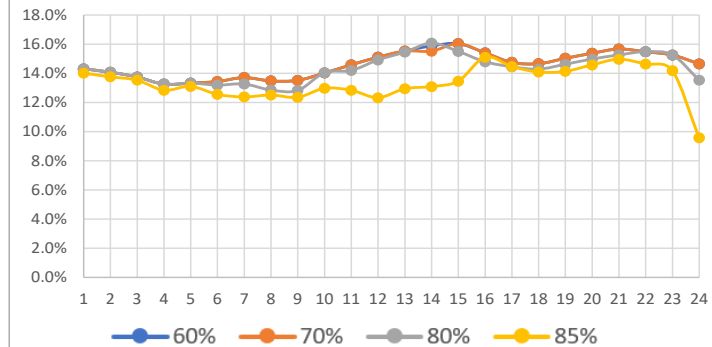
Wind QC, for December, using Exceedance Method



Solar QC, for December, using ENLR Method



Wind QC, for December, using ENLR Method





# Conclusions

- ✦ **Assuming that data provided by PG&E is accurate:**
  - Confirms that ENLR values are generally more stable than exceedance values
  - ENLR at high load threshold levels represents VERs' generation when it is needed to meet demand (similar to ELCC)