Statistical Analysis
Limited Generation Profile

Together, Building
a Better California

Recommendation and Findings

- PG&E maintains the Joint IOU recommendation for 12 unique LGP values repeated 24x each month to produce a 288 profile.
- The scenarios studied has been ranked based on the risk of violations to highlight the risk and benefits associated with each case for stakeholders' review.

- **Risk:**
  - The thermal and voltage violations happen more frequently with more granular LGP profiles.
  - ~ 40% more violations are observed with 288 LGP compared to 12LGP.
- **Consequence:**
  - The thermal and voltage violations happen with higher magnitude with more granular LGP profiles.
  - ~30% increase is observed in average magnitude of violations for 288 LGP compared to 12LGP, for the 5 detail study cases.
- **Benefits:**
  - Higher energy could be exported with more granular LGP profiles.
  - ~ 10% more energy could be exported with 288LGP compared to 12LGP.
- **Observations:**
  - The limiting criteria varied by node and number of LGP values.
  - Voltage and thermal were the most common limiting criteria.

Overview of the Analysis

- 16 LGP scenarios have been studied, comparing ICA profiles from Period 1 and Period 2:
  - Period 1: January 2022 publication
  - Period 2: January 2023 publication

  } Common circuits and linesections

- System wide study: ICA results of circuits published in Period 1 and Period 2 are compared:
  - Total circuits: 339
  - Total sections: 155,105
  - Total section hours: ~ 44 M

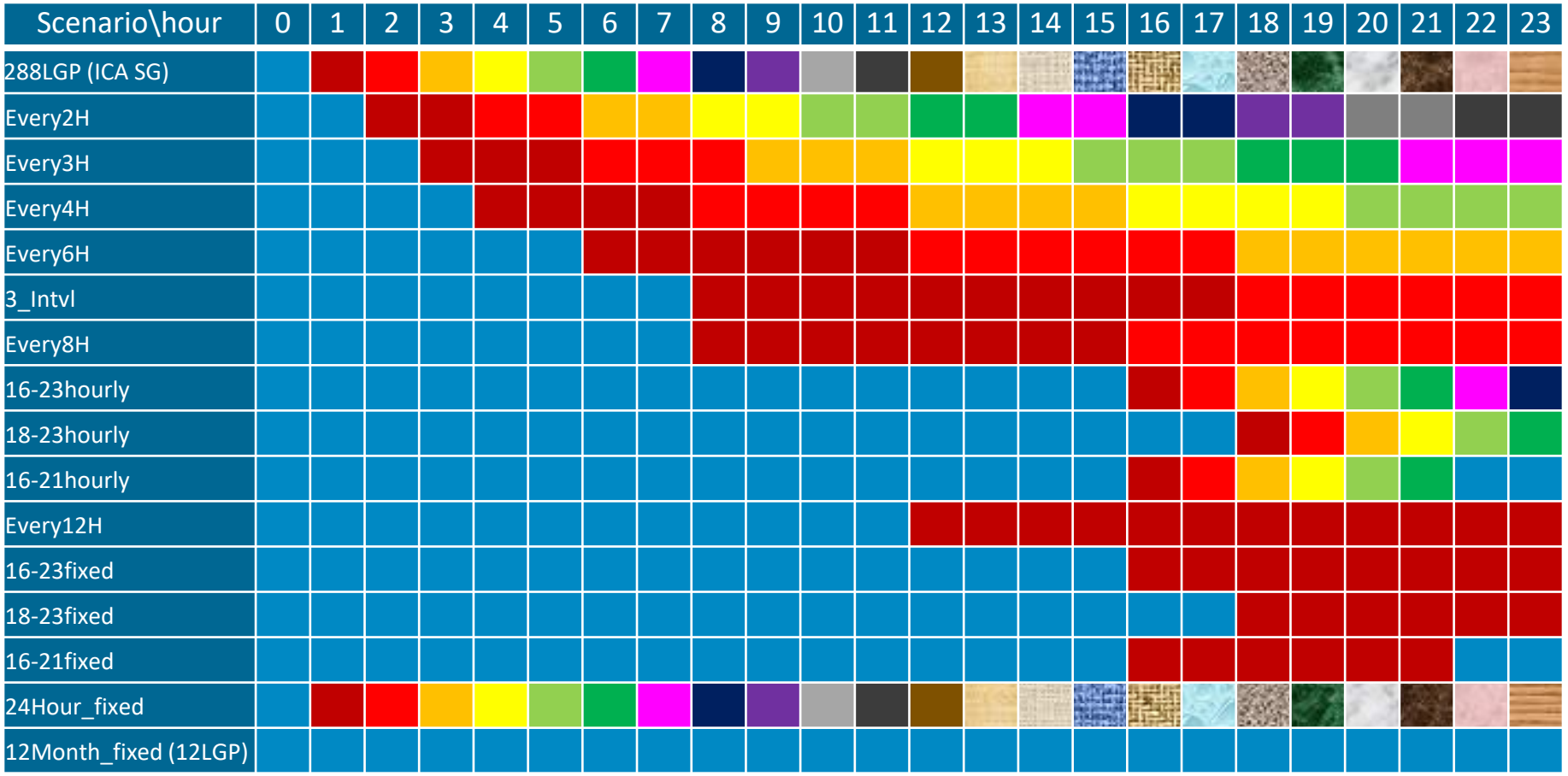
- Detail study: PG&E has five regions. One circuit/section from each region is selected for detail study.

- Assumptions:
  - For each LGP of Period 1 the values are compared to the 288LGP of Period 2.
  - The 288LGP of Period 2 is the maximum possible granularity (used as reference). Any generation more than this would result in violation of a voltage, thermal, and/or protection constraint.
  - All LGP scenario of Period 1 are multiplied by 90% to consider 10% buffer in hosting allowance.
  - PG&E reports the following:
    a) Energy (kWh): delivered over the course of the year for each of the LGP scenarios.
    b) Violation Hours Count: Number of hours where 288LGP of Period 2 is less than 90% of the LGP scenario of Period 1.
    c) Violation Magnitude: The difference between 288LGP of Period 2 and 90% of the LGP scenario of Period 1.
    d) Limiting criteria: Identify the criteria for each violation.

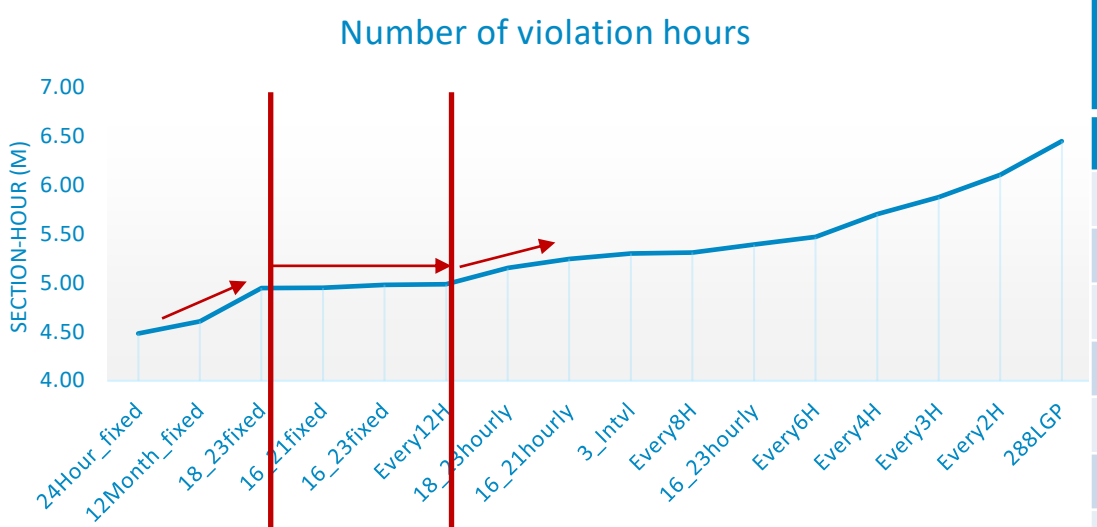
P.S. The difference in the connected amount of generation for ICA calculations in Period 1 vs. Period 2 is not accessible to report.

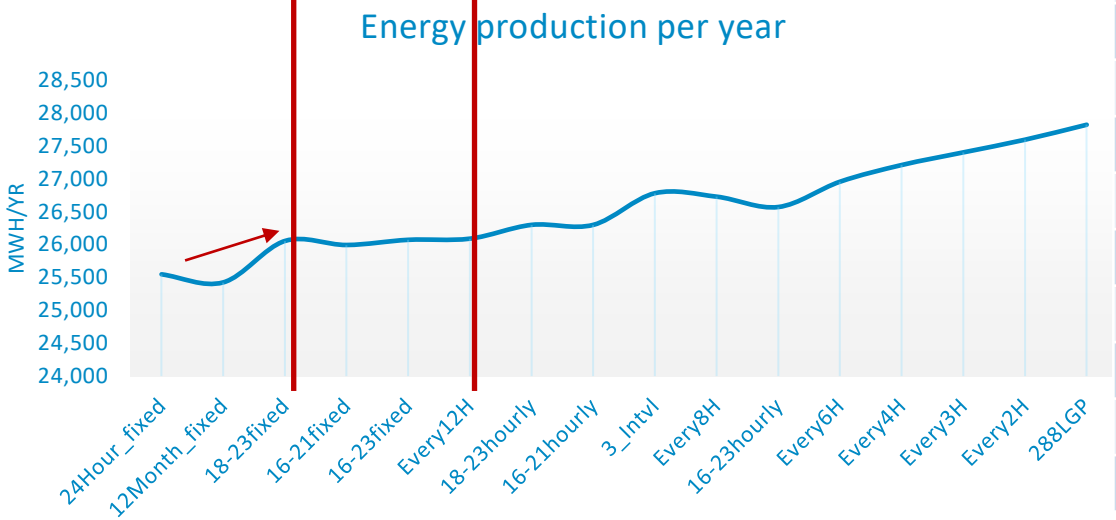
Scenarios

- In each scenario, hours with the same color should have the same LGP value.
- Except for 24Hour_fixed scenario which has same hourly values for all months, the values of other scenarios can change monthly.



System-Wide Study
Total Section Hours: ~ 44 M

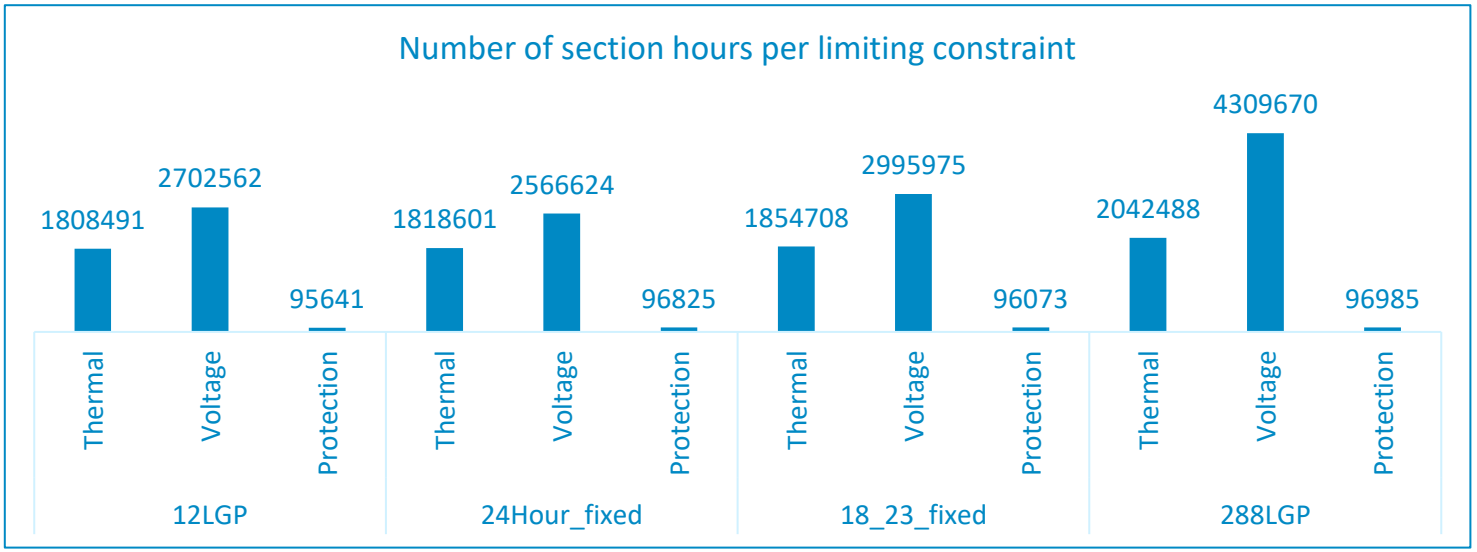


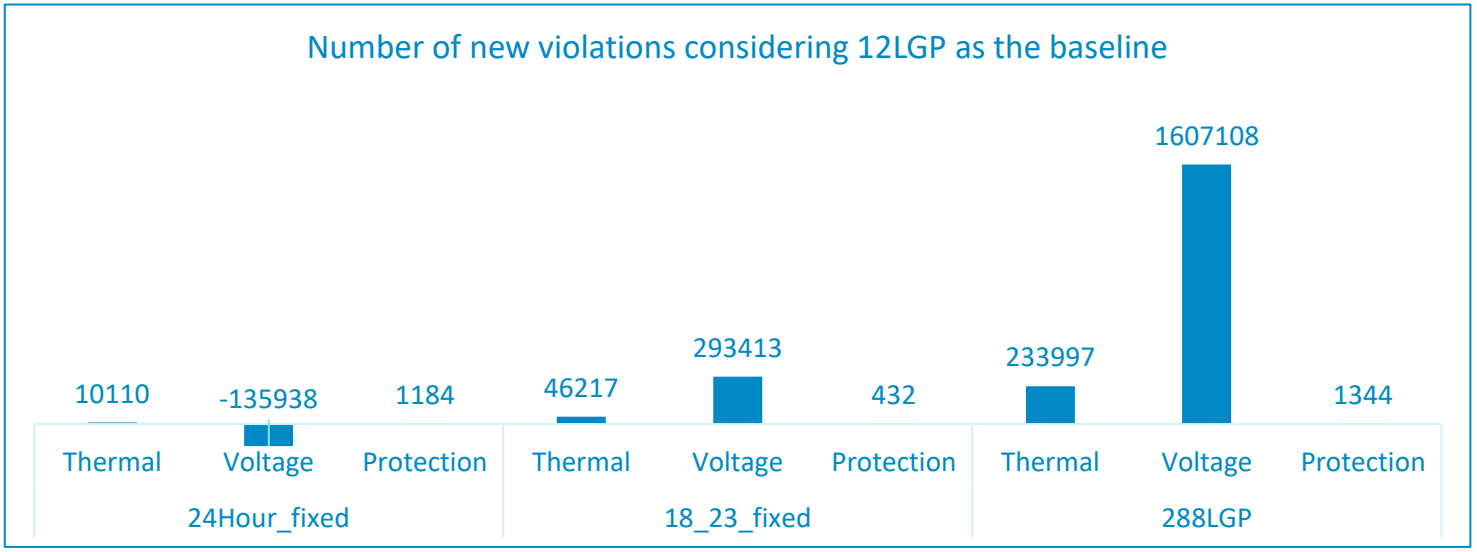


Percent of increase
12Month_fixed is the baseline
(Ranked based on violation)

Scenarios	Granularity	Energy	Violation
288LGP	288	9.4%	40.0%
Every2H	144	8.5%	32.5%
Every3H	96	7.8%	27.6%
Every4H	72	7.0%	23.8%
Every6H	48	6.0%	18.7%
16_23hourly	108	4.5%	17.0%
Every8H	36	5.1%	15.3%
3_Intvl	36	5.3%	15.0%
16_21hourly	84	3.4%	13.8%
18_23hourly	84	3.4%	11.8%
Every12H	24	2.6%	8.2%
16_23fixed	24	2.5%	8.1%
16_21fixed	24	2.2%	7.4%
18_23fixed	24	2.5%	7.4%
12Month_fixed	12	0.0%	0.0%
24Hour_fixed	24	0.5%	-2.7%

System-Wide Study

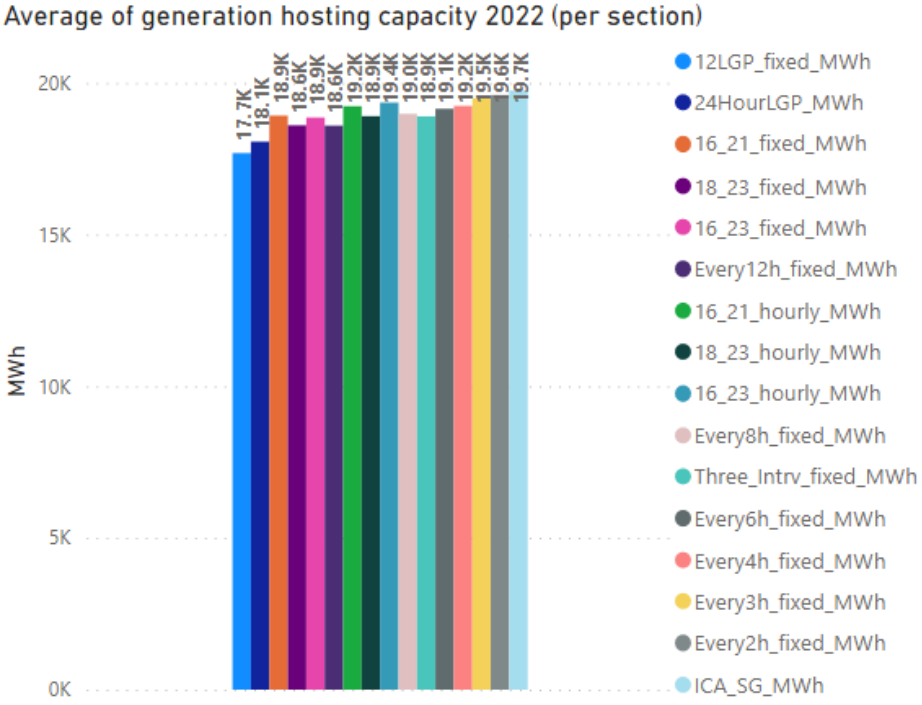


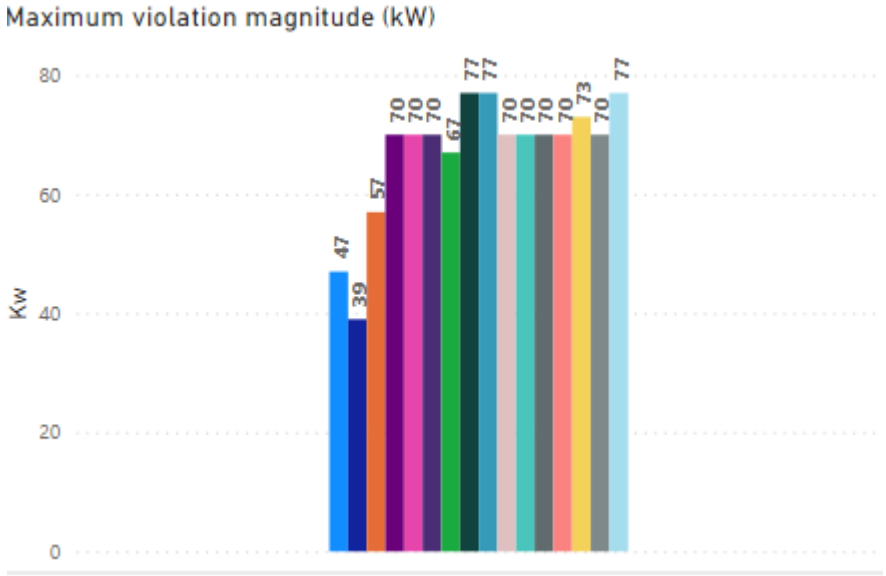


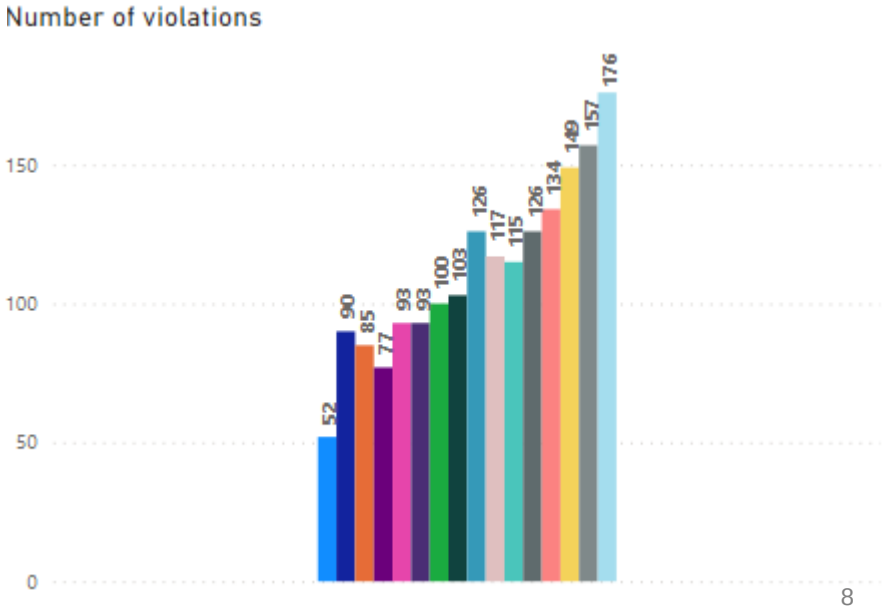
Selection of Detail Study Cases

- PG&E has divided its territory to 5 main regions.
- One circuit from each region is selected for detail studies in this analysis.
- Circuits for each region are selected randomly.

Example 1: North Coast Region
Circuit: 042631110 / Section: 3720501





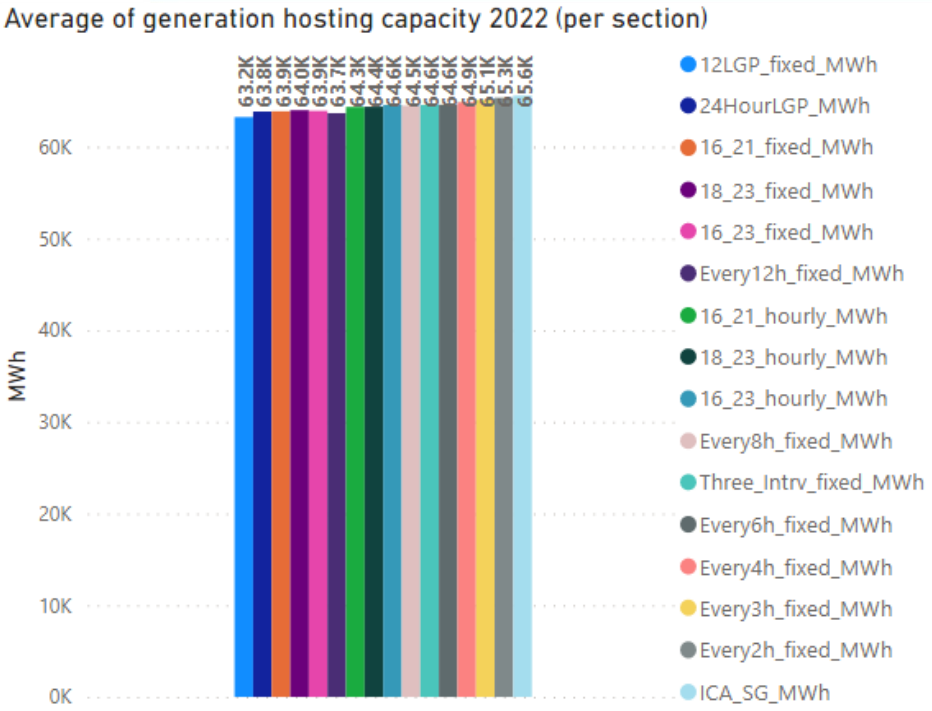


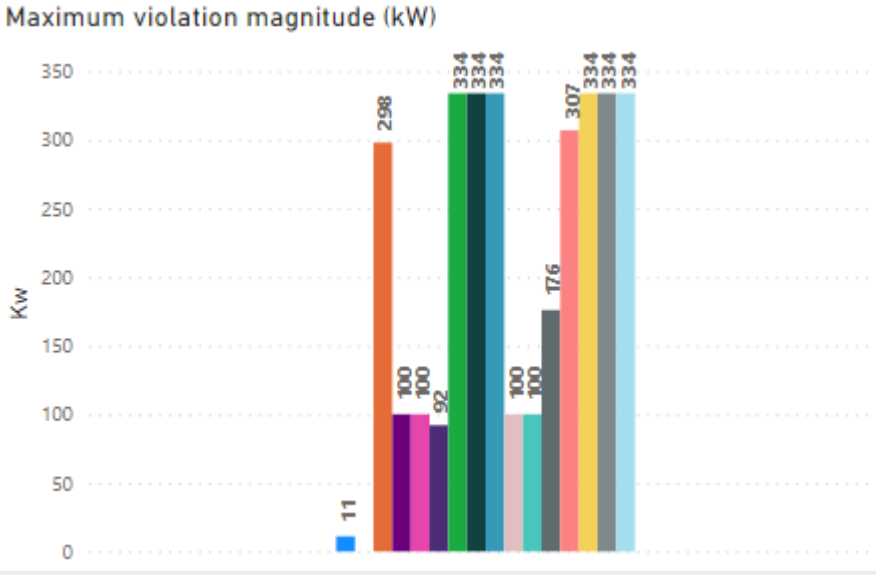
Scenario	Energy (MWh)	Max Violation Magnitude (kw)	Number of Violation
12LGP	17.7k	47	52
288LGP	19.7k	77	176
18-23 fixed	18.6k	70	77

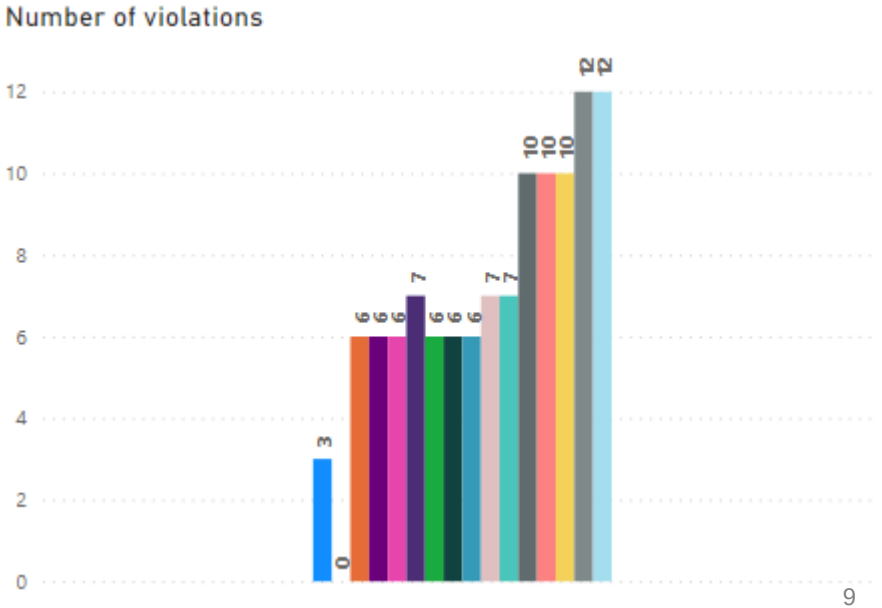
Violation criteria for maximum violation magnitude:

- 12 months thermal

Example 2: North Valley Region Circuit: 102041101 / Section: 3291545





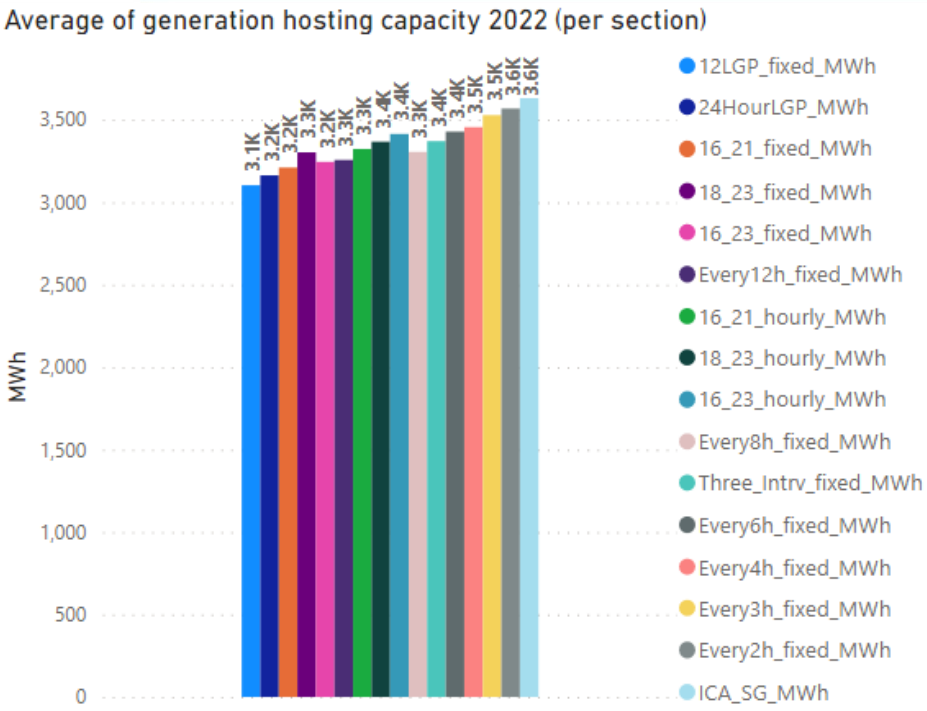


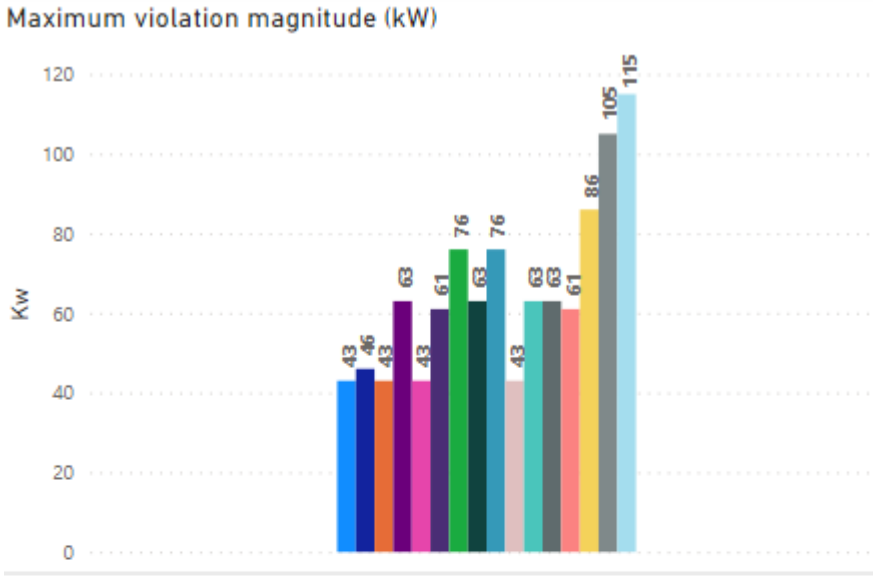
Scenario	Energy (MWh)	Max Violation Magnitude (kw)	Number of Violation
12LGP	63.2k	11	3
288LGP	65.6k	334	12
18-23 fixed	64.0k	100	6

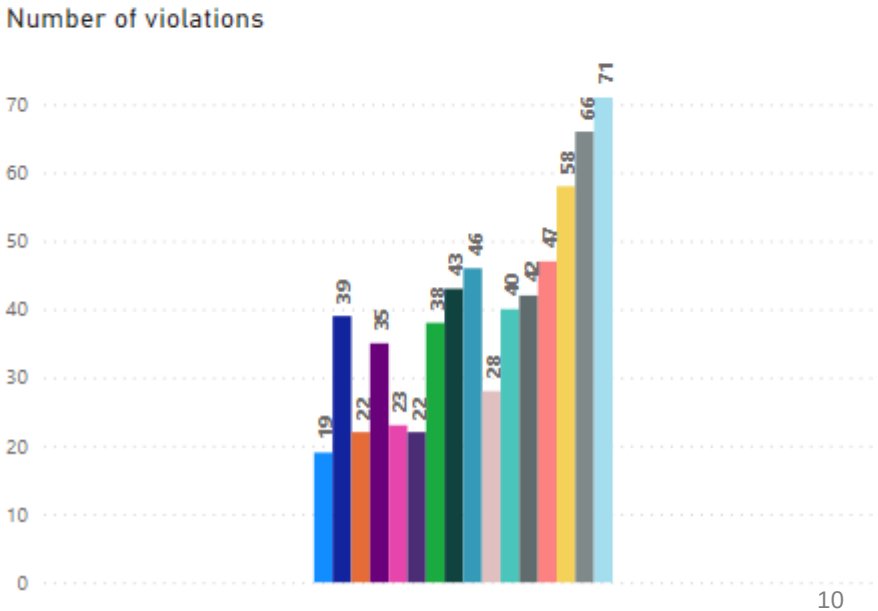
Violation criteria for maximum violation magnitude:

- 2 months thermal & 1 month voltage

Example 3: Bay Area Region
Circuit: 013111151 / Section: 4045214





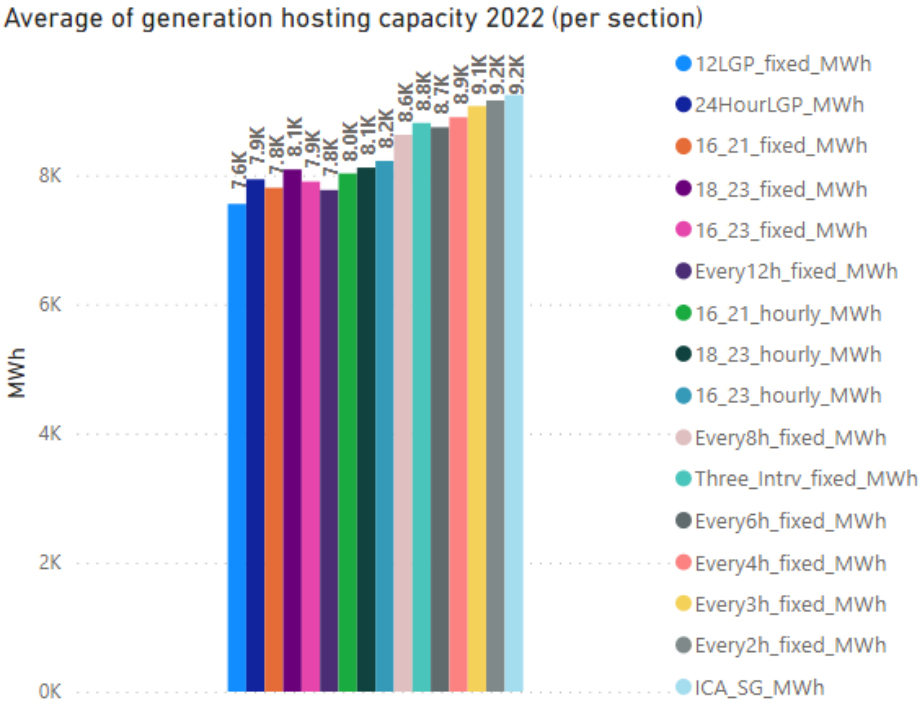


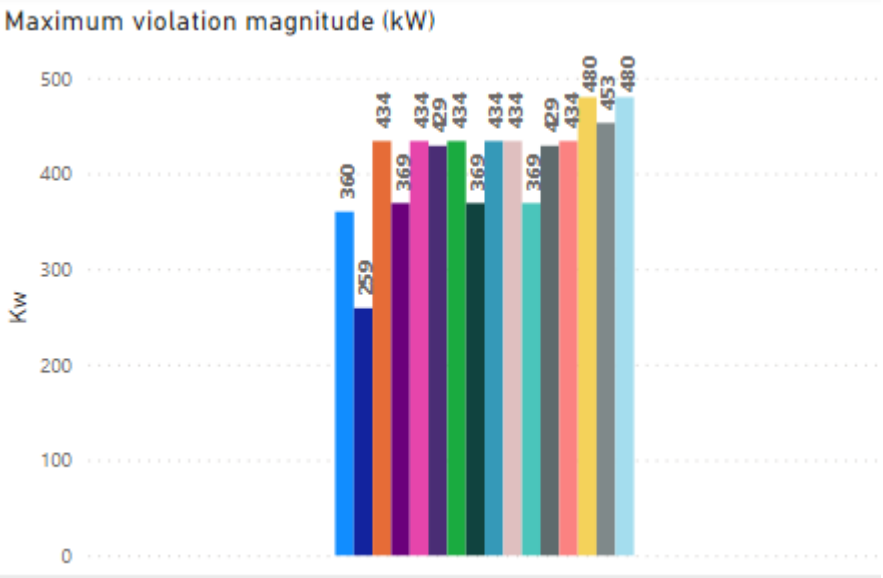
Scenario	Energy (MWh)	Max Violation Magnitude (kw)	Number of Violation
12LGP	3.1k	43	19
288LGP	3.6k	115	71
18-23 fixed	3.3k	63	35

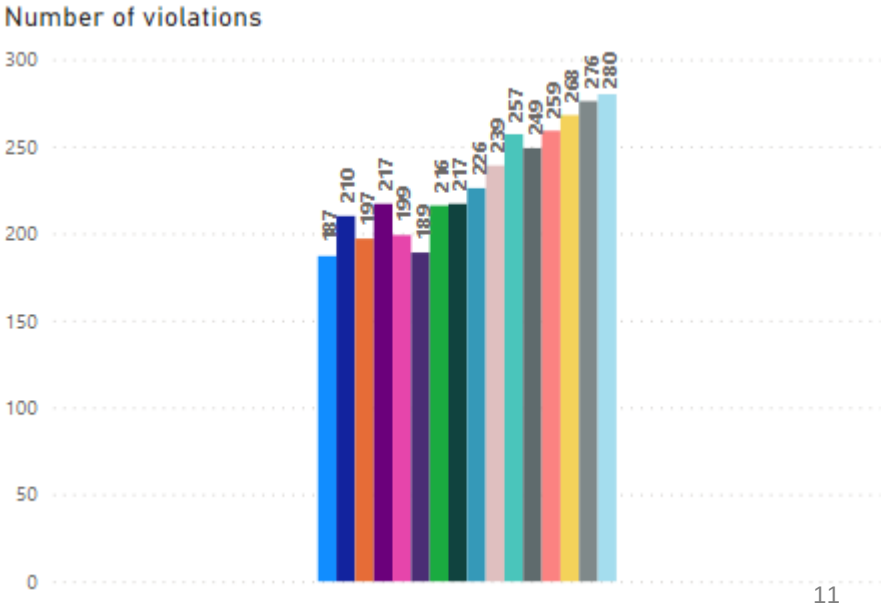
Violation criteria for maximum violation magnitude:

- 5 months voltage

Example 4: South Bay & Central Coast Region Circuit: 083631108 / Section: 5088282





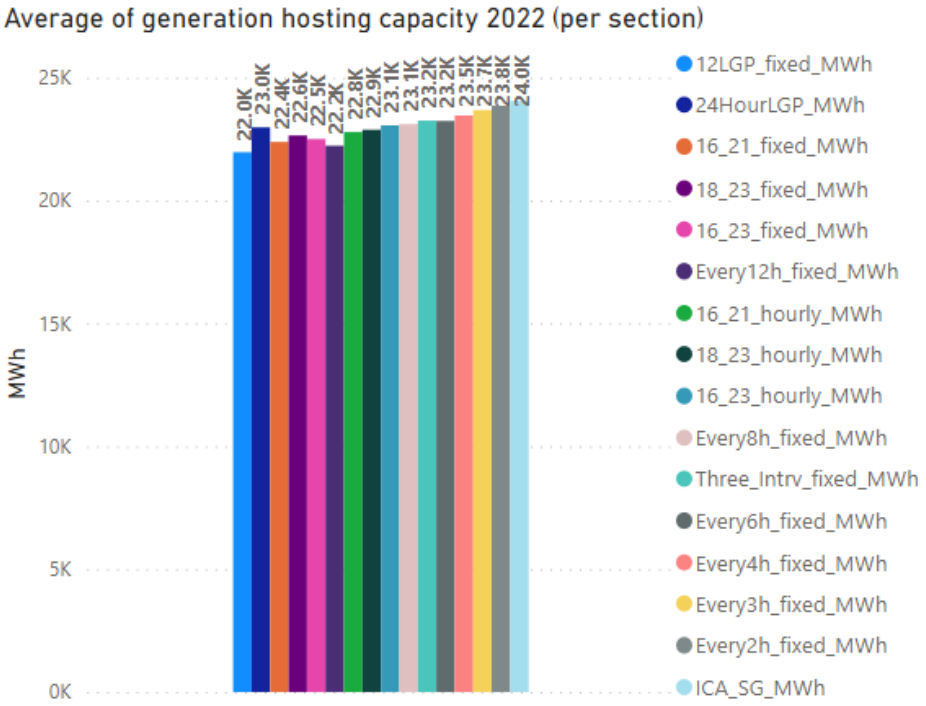


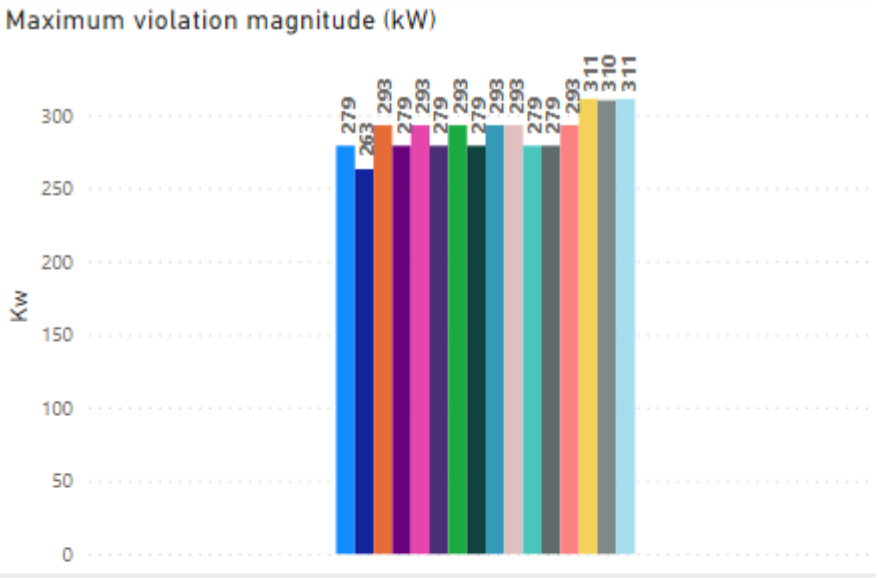
Scenario	Energy (MWh)	Max Violation Magnitude (kw)	Number of Violation
12LGP	7.6k	360	187
288LGP	9.2k	480	280
18-23 fixed	8.1k	369	217

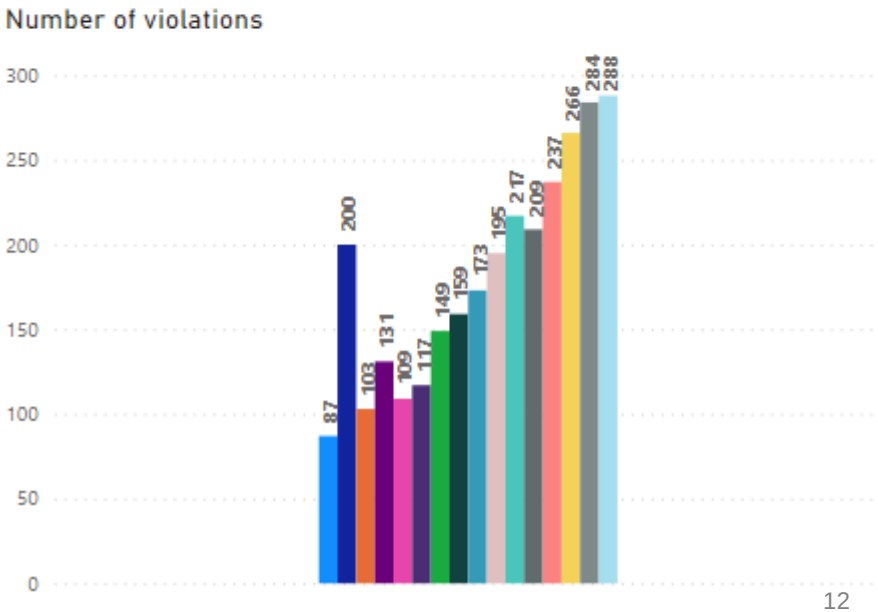
Violation criteria for maximum violation magnitude:

- 11 months thermal & 1 month voltage

Example 5: Central Valley Region Circuit: 163301105 / Section: 3307444







Scenario	Energy (MWh)	Max Violation Magnitude (kw)	Number of Violation
12LGP	22.0k	279	87
288LGP	24.0k	311	288
18-23 fixed	22.6k	279	131

Violation criteria for maximum violation magnitude:

- 12 months thermal