High DER Future Grid Study Workshop #2 Gaps in Operations Needed

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Operations Needed : Gaps

- Operation Needed: Set policy on, authorize, and implement interconnection; **establish DER operating limits** and (smart) inverter requirements.

- Gap: DERs are not always allowed to operate when and as would be most societally optimal.

  - This could be due to inaccurate (or overly conservative) integration capacity analysis (ICA), or other limits, both for imports and exports.

- At present, import and export limits use separate single values of grid capacity: the annual minimum capacity for imports and exports, respectively; this is highly conservative and limits grid utilization.

Status and recommendation:

- The Commission is in the process of applying more than one value per year for export limits, using Limited Generation Profiles (LGP), in the interconnection proceeding.

- The Commission could take a similar approach with respect to load.

  - The Utilities have begun to propose such programs, for example, through Advice Letter 5138-E: *Establishment of Southern California Edison Company's Customer-Side, Third Party Owned, Automated Load Control Management Systems Pilot*.
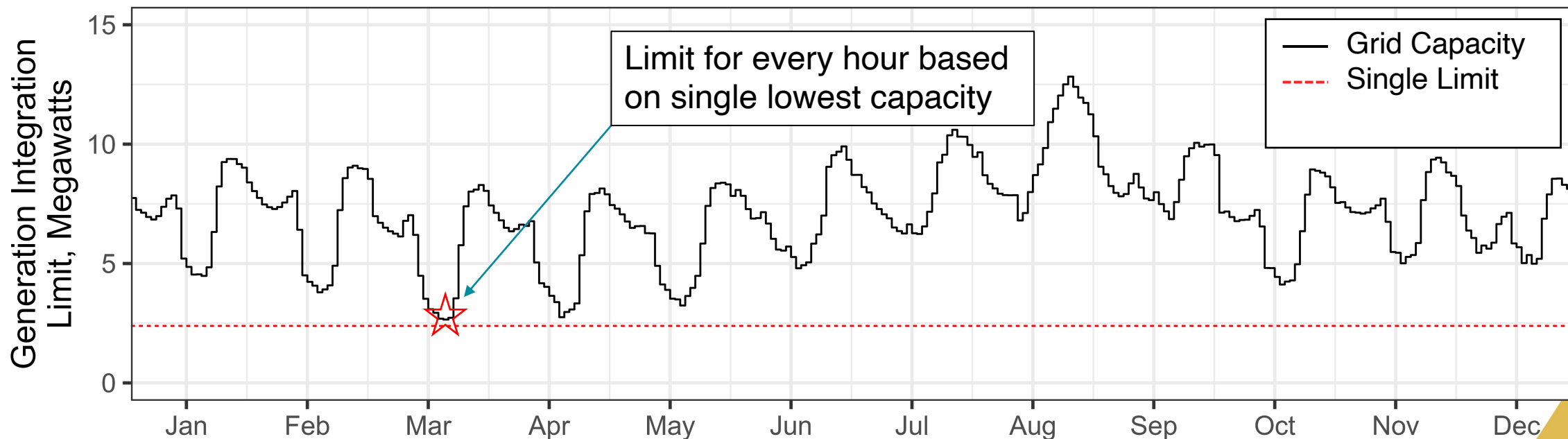
Flexible import limits

- ICA profiles, as below, provide 288 values per year (12 months X 24 hours = 288).
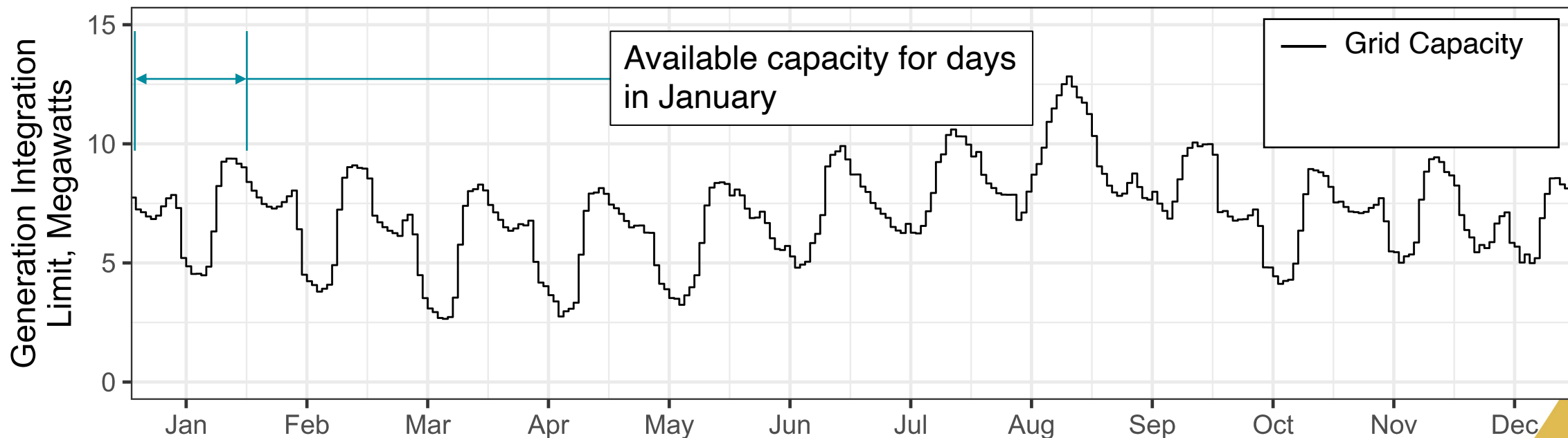
Data from ICA Release 4, Mulholland 16-kilovolt feeder in the Santa Monica Maintains
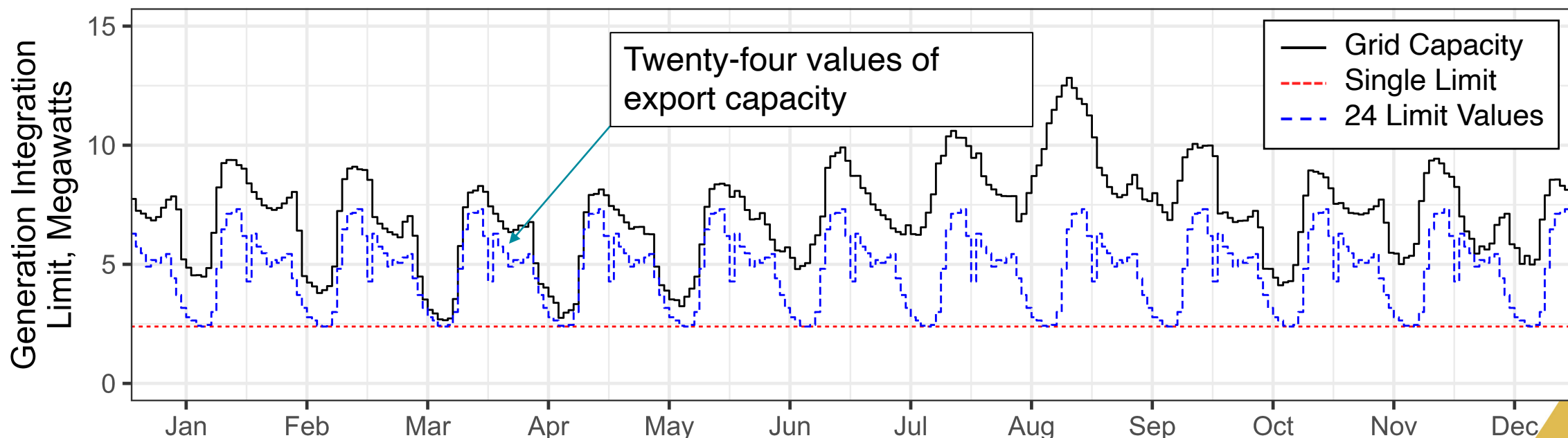
Flexible import limits

- At present, the capacity allowed for interconnection is the single lowest value among the 288.

- The same type of limit is applied to load (though not through the ICA).

Data from ICA Release 4, Mulholland 16-kilovolt feeder in the Santa Monica Maintains

Flexible import limits

- Moving from a single value to multiple values (for exports **and** imports) can unlock grid capacity.

  - Draft Resolution E-5296 envisages LGPs that use 24 values per year for export limits.

  - Limits can, in principle, be preset, real-time, or a combination (e.g., preset limits with real-time curtailments under grid emergency conditions).

Data from ICA Release 4, Mulholland 16-kilovolt feeder in the Santa Monica Maintains

Flexible import limits

- A Commission decision that leads to use of flexible import limits could create a standard for Utilities' automated load control systems (otherwise known as flexible interconnections, or flexible import limits).

  - Flexible import limits could provide the short-term benefit to all ratepayers of increased energy sales, which tend to lower rates.

  - Customers in capacity-constrained areas could be energized earlier than they would be if additional capacity had to be built first ("bridge-to-wires").

  - In the long term, the downward pressure on rates* could increase as more customers benefit from flexible import limits.

- Flexible import limits should be standardized. Are standards needed beyond Underwriter Laboratories' UL 3141 (for Power Control Systems)?

> *Downward pressure on rates means that rates with flexible import limits could be lower than counterfactual rates, all other things being equal. Rates may still increase overall due to other factors such as wildfire mitigation or clean energy procurement.

Appendix

Operations needed - reduced

1. Operate distribution grids: Maintain operational flexibility, voltage stability, safety, etc.

2. Maintain grid frequency: Ensure sufficient (local and bulk) inertia, generation capacity, and frequency response.

3. Set policy on, authorize, and implement interconnection; **establish DER operating limits** and (smart) inverter requirements.

4. Choose when to operate (*i.e.*, schedule) DERs.

5. Operate (*i.e.*, dispatch) DERs.

7. **Model and monitor DER and non-DER data and convey to transmission operator.**

8. *e.g.*, develop the function $Net\ Demand = f(Price)$.
   Manage data access for all data relevant to distribution grid operation: Track DER performance and interconnection characteristics, DER state-of-charge, cost of operation, historical performance, aggregator data, real-time prices. Manage confidentiality and data access.

9. **Set appropriate rates for consumption and generation based upon cost causation.**

   - Prevent market manipulation.

10. System defense and restoration (*e.g.,* cybersecurity, emergency load reduction, resiliency, black start).