



Workshop on Flexible Resource Adequacy and Capacity Requirements



R.14-10-010

April 5, 2016

California Public Utilities Commission





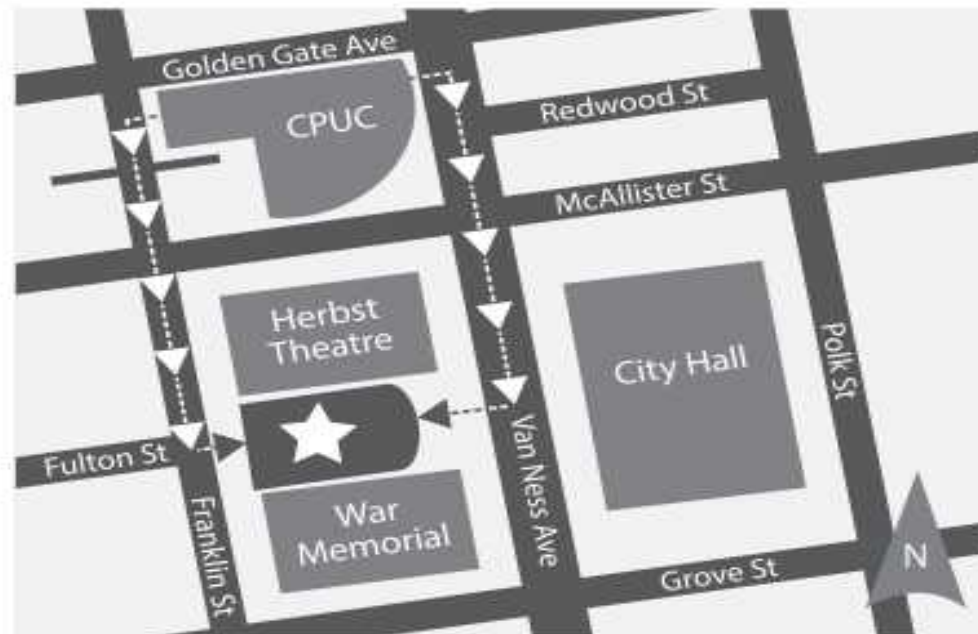
Evacuation Procedure

In the event of an emergency evacuation, please calmly proceed out the nearest exit.

Our assembly point is the park between Herbst Theater and War Memorial Theater

San Francisco Evacuation site:

The Garden Plaza Area Between Herbst Theater and the War Memorial Opera House Buildings





Remote Access

- Please place yourself on mute, and remain on mute unless you are asking a question
- **To mute / unmute press *6**
- **PLEASE DO NOT PUT YOUR LINE ON HOLD!**

To join by phone:

Teleconference number: **866-811-4174**

Participant code: **4390072#**

Join WebEx meeting

Meeting number: 748 887 805

Meeting password: !Energy1





Purpose of Workshop

- Address issues in scope of Track 2
- Consider and discuss party proposals in Track 1 related to flexibility
- Discuss staff and party proposals for modifying existing flexible RA requirements
- Consider analysis of operational needs for flexibility





Purpose of Track 2

“The primary focus of Track 2 (anticipated late 2016 decision) is to adopt a durable flexible capacity requirement program.

In D.14-06-050, the Commission anticipated the evolution of the FCR program; the Track 2 Decision will potentially be the first major step in that process of evolution.”





Purpose of Track 2 cont...

- “To provide market certainty, we must strive to limit the frequency of substantial changes to the FCR program and product design.”
- “We intend the definition of the flexible capacity product(s) and process for setting FCRs to remain constant beginning with RA compliance year 2018. Therefore, parties are encouraged to take a long view in making proposals”





Fundamental Questions

1. What reliability need(s) must FCRs be designed to meet?
 - a) Has our understanding changed since 2014?
2. What definition of flexible capacity product(s) should be adopted to meet this need or needs?
3. How should annual & monthly FCR requirements be set to meet needs?
4. What, if any, related changes to the RA program should be made to best meet the reliability needs?





Presentation of Staff Analysis

Simone Brant, Energy Division

Current Requirements

- Flex Categories
- Number of Starts

Category 1

- Is it working as intended?
- What improvements are needed?

Potential Alternatives – minor and major adjustments





Calculation of Flexible Requirements

- Total requirement based on largest 3-hr ramp of the month plus 3.5% of peak load
- Category 1 (Base): based on largest secondary net load ramp
 - In flex study based on maximum am and pm ramp
- Category 2 (Peak): Difference between 95% of the max 3-hr net load ramp and largest 3-hr secondary ramp
- Category 3 (Super Peak): 5% of max 3-hr net load ramp





Current Flexible Requirements

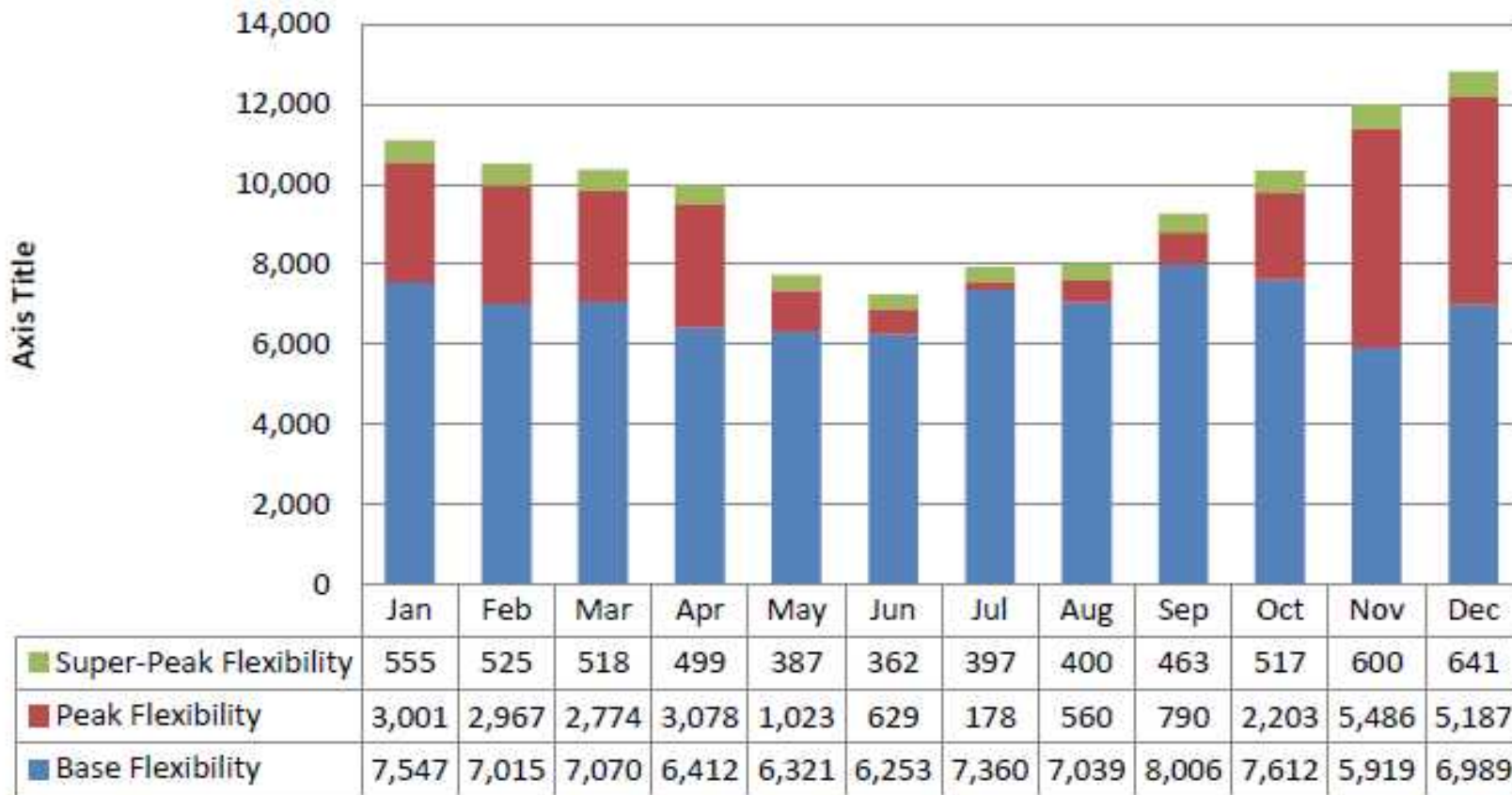
	Category 1	Category 2	Category 3
Must-offer obligation	17 Hours	5 Hours	5 Hours
	5 AM- 10 PM Daily For the whole year	12 PM to 5 PM for May – September	12 PM to 5 PM for May – September
	5 AM- 10 PM Daily For the whole year	3 PM- 8 PM for January- April and October-December	3 PM- 8 PM for January- April and October- December
	Daily	Daily	Non-holiday weekdays
Energy limitation	At least 6 Hours	At least 3 Hours	At least 3 Hours
Starts	The minimum of two starts per day or the number of starts feasible with minimum up and down time	At least one start per day	Minimum 5 starts a month
Percentage of LSE portfolio of flexible resources	At least 87 % for May – September	Up to 13% for categories 2 and 3 combined	Up to 5%
	At least 63 % for January- April and October-December	Up to 37% for categories 2 and 3 combined	Up to 5%





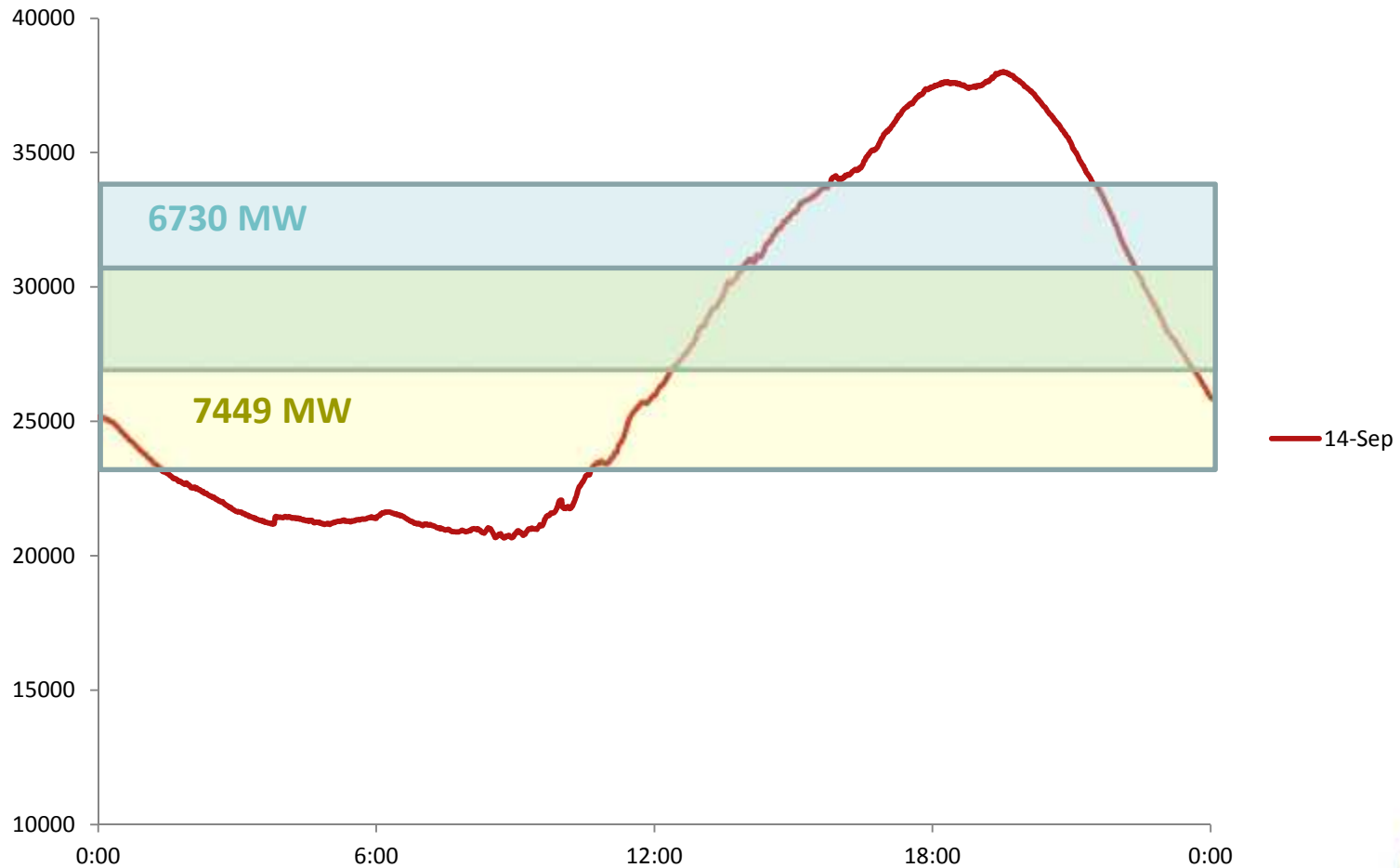
2016 Flexible Need Calculation

Total Flexible Capacity MW Need by Category



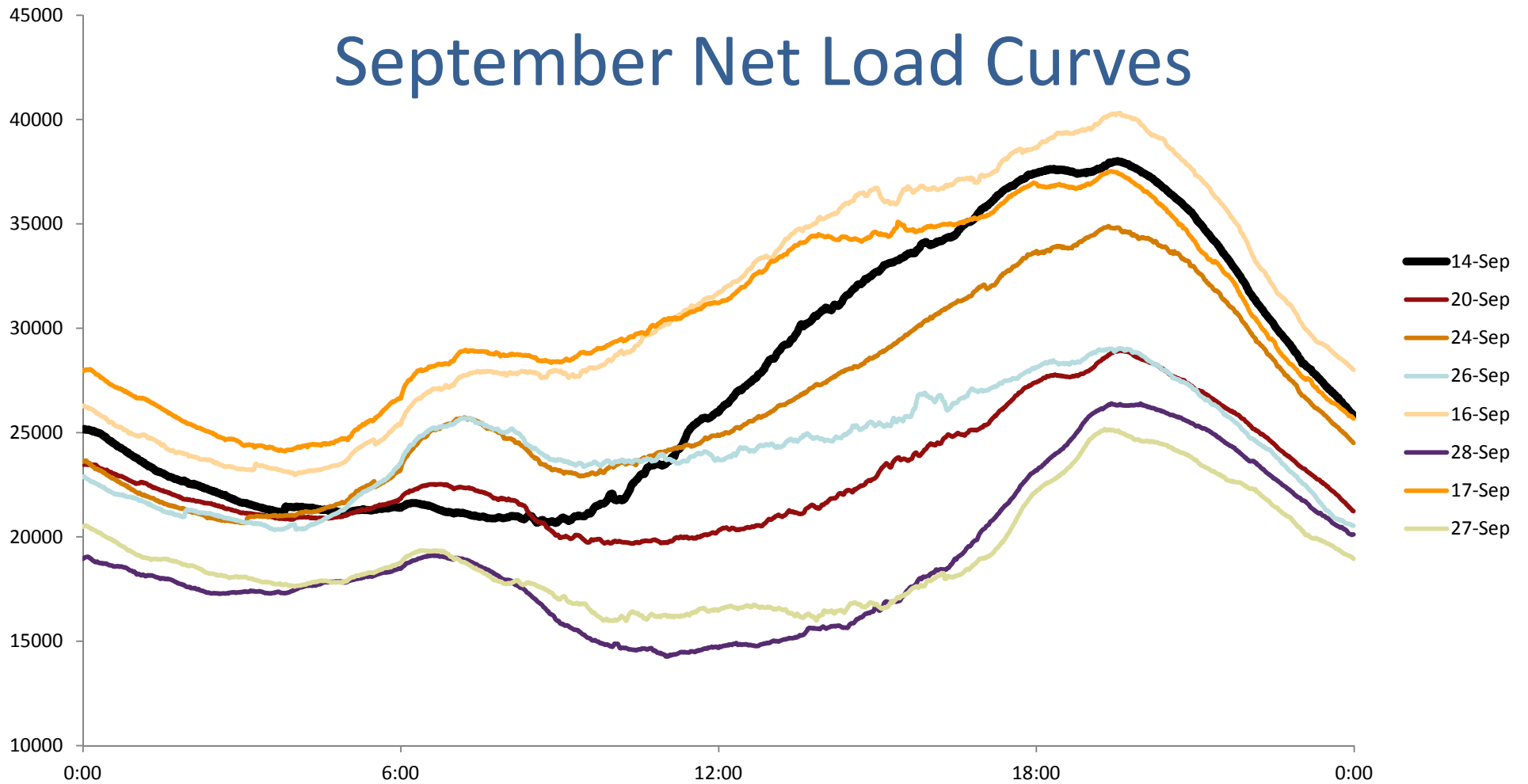


September 2016 Requirement





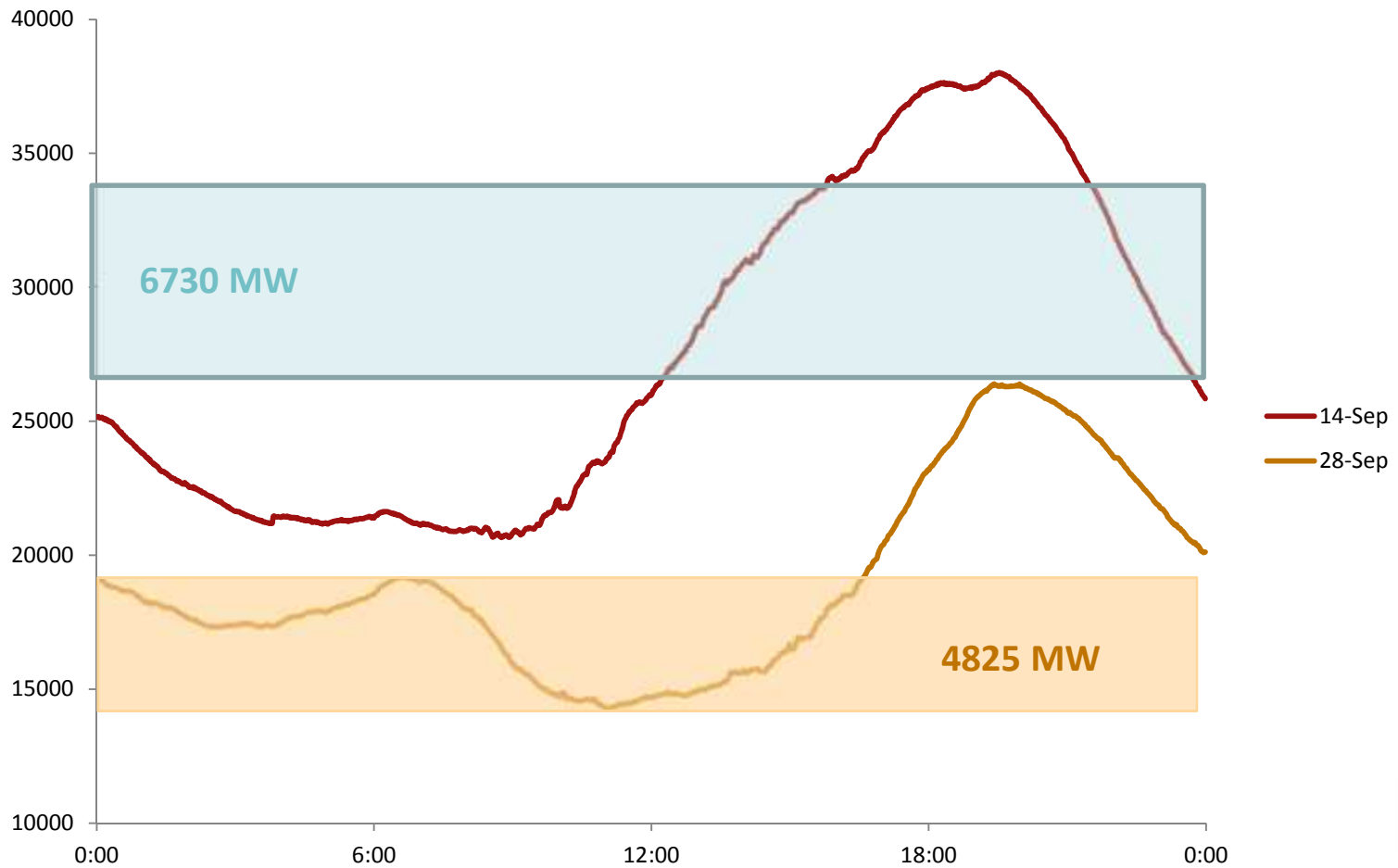
September Net Load Curves





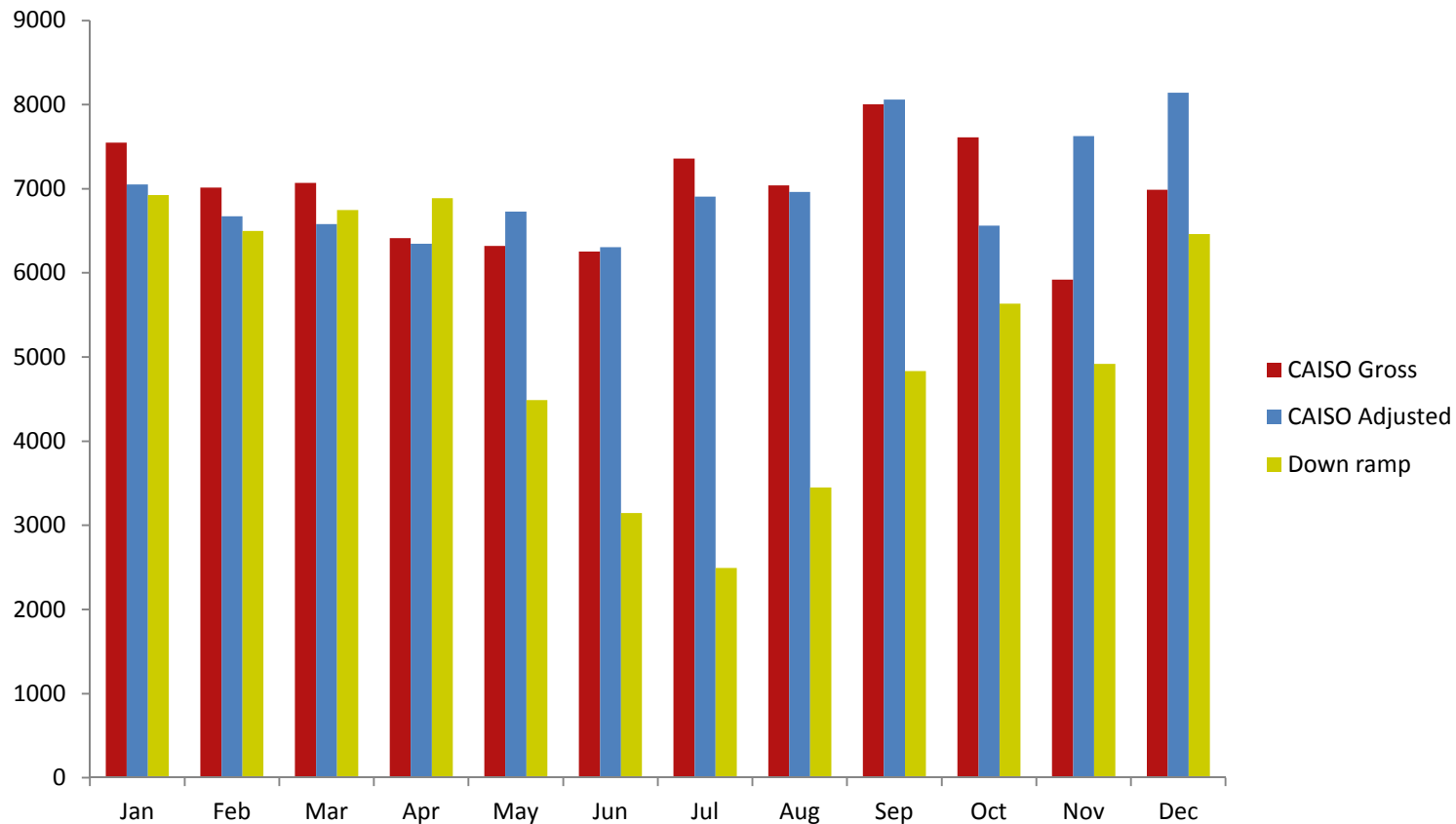
September Alternative

Day with largest downward ramp vs. largest secondary ramp





Current Category 1 vs. Down Ramp Alternative

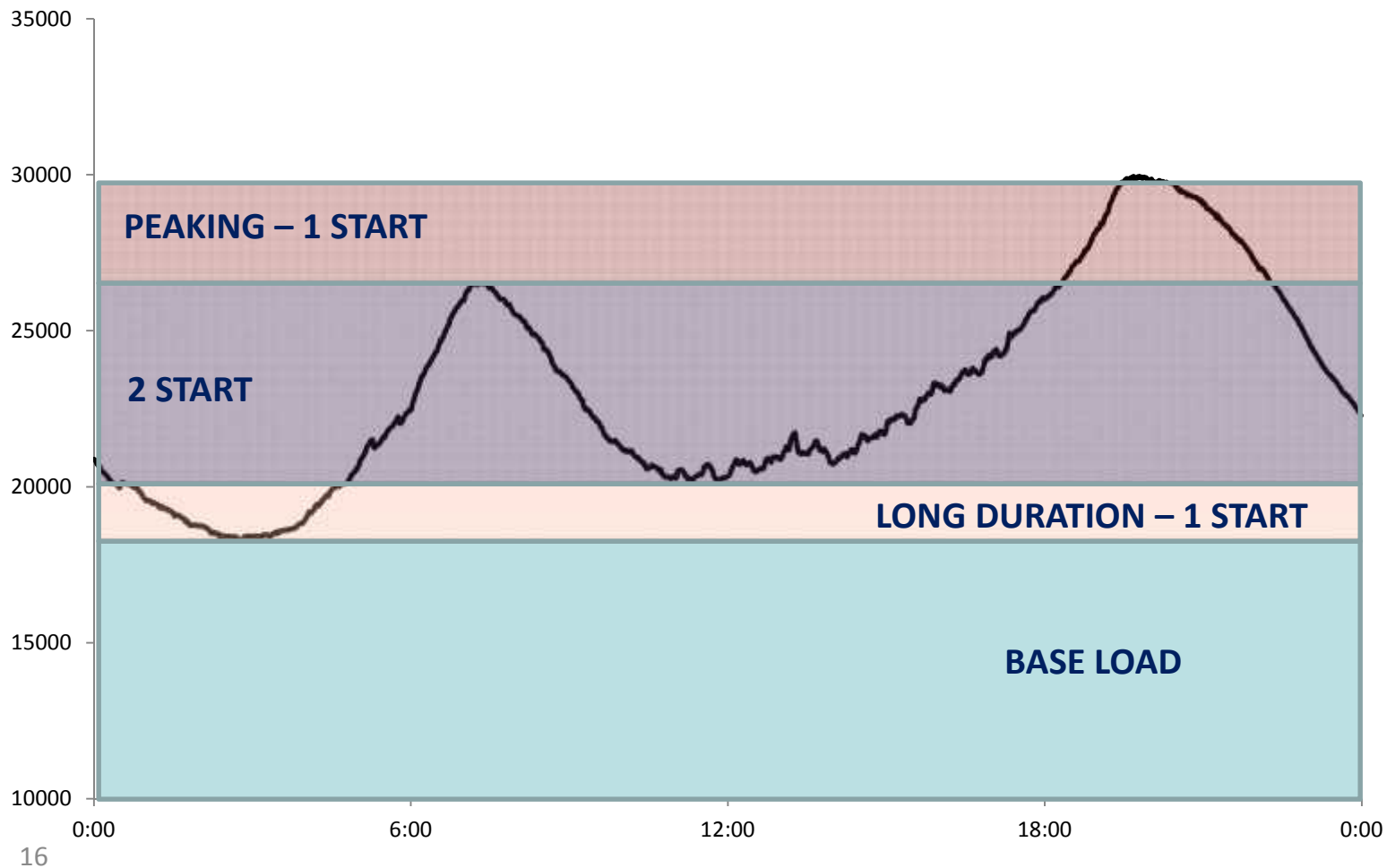


Results in similar requirements for most months (except summer which is significantly lower)



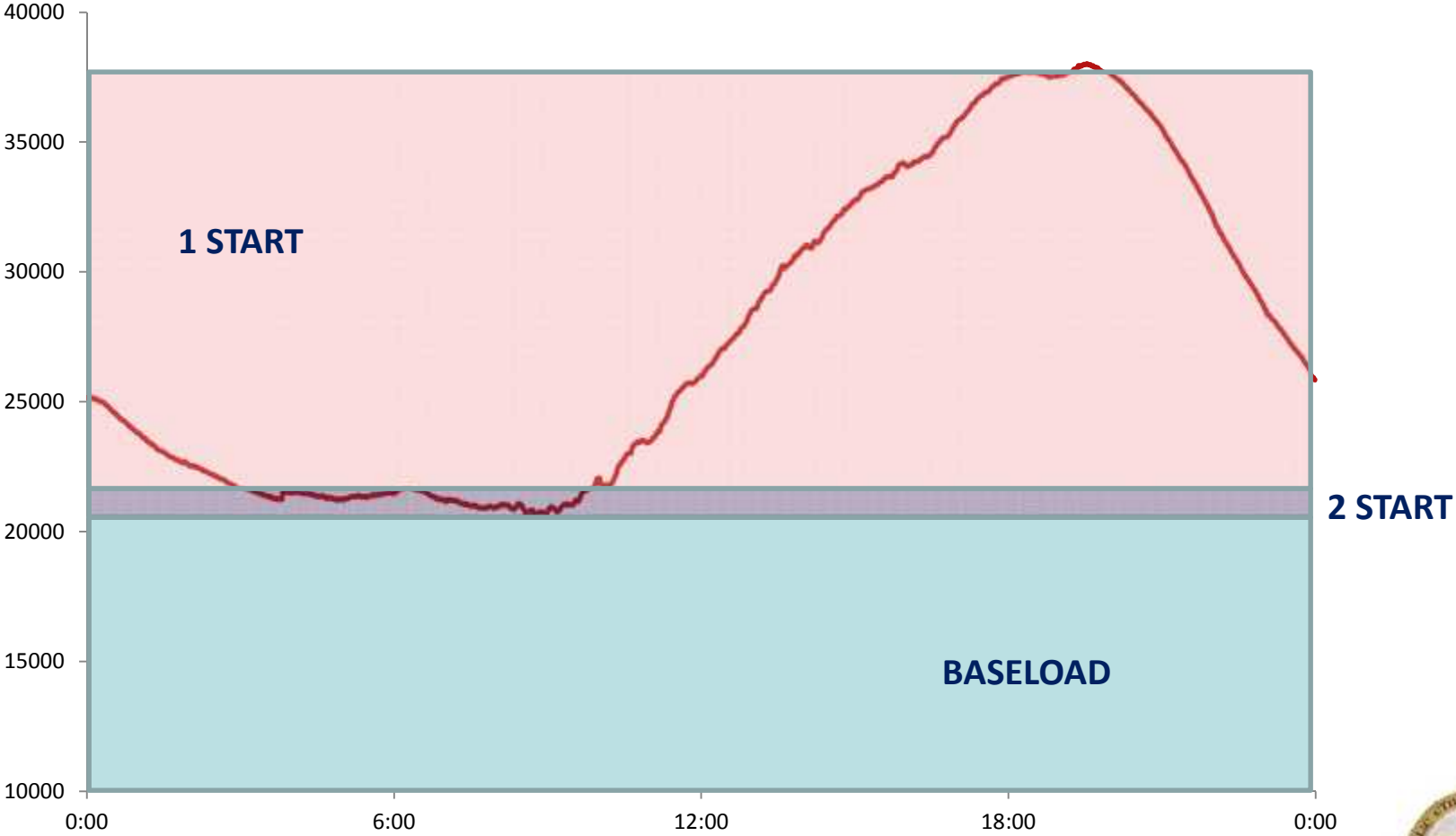


Alternate Approach – Spring Day



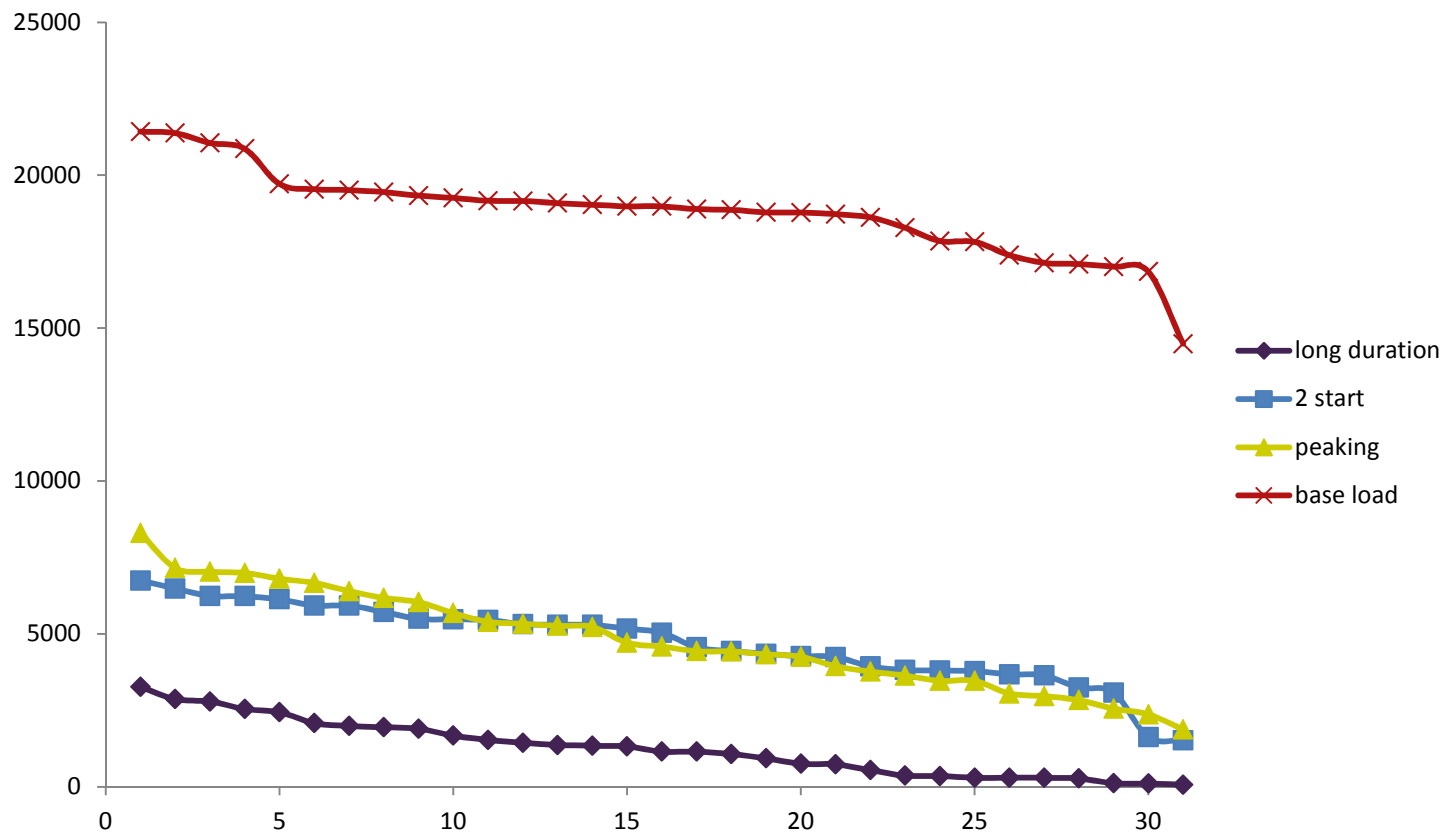


Summer Day





Daily Distribution - March

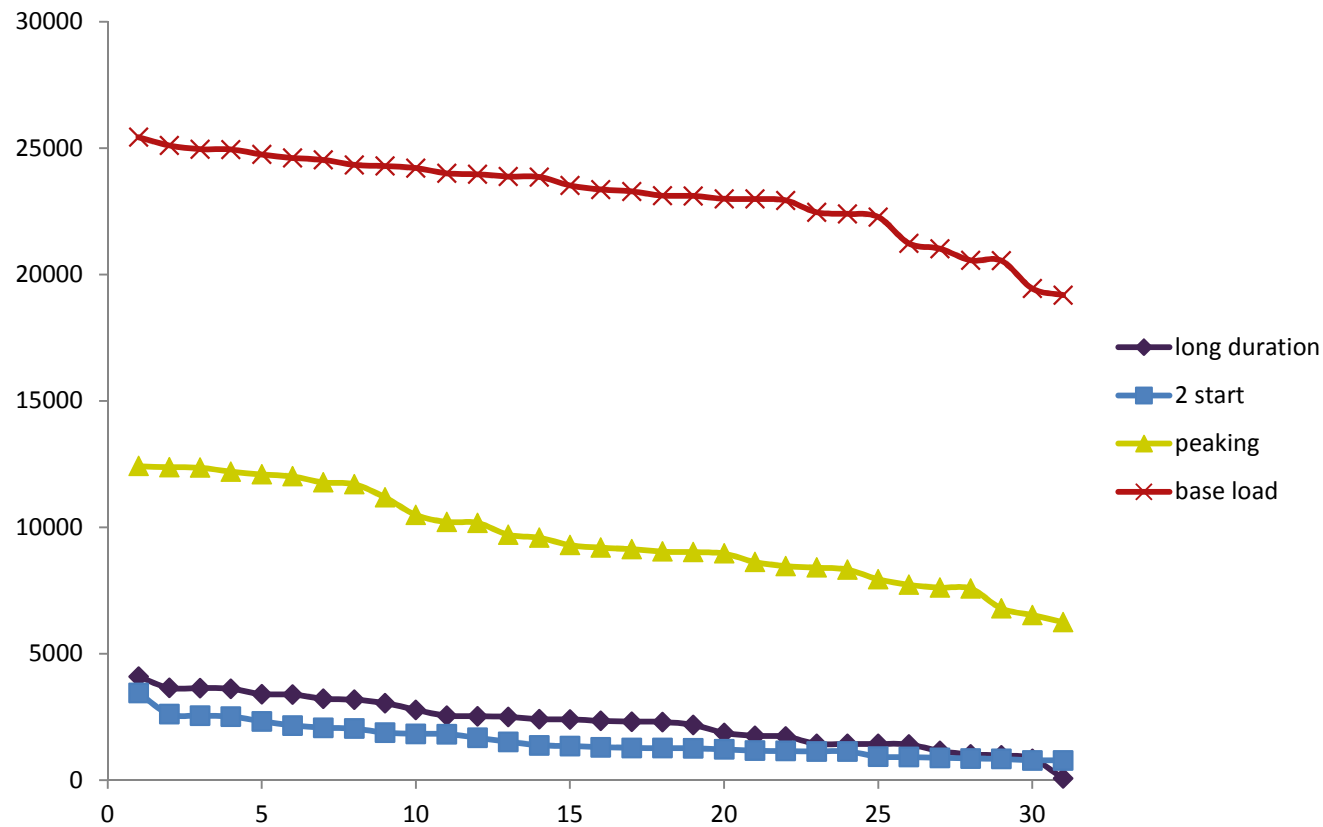


* Values are sorted largest to smallest so do not represent one day





Daily Distribution - September

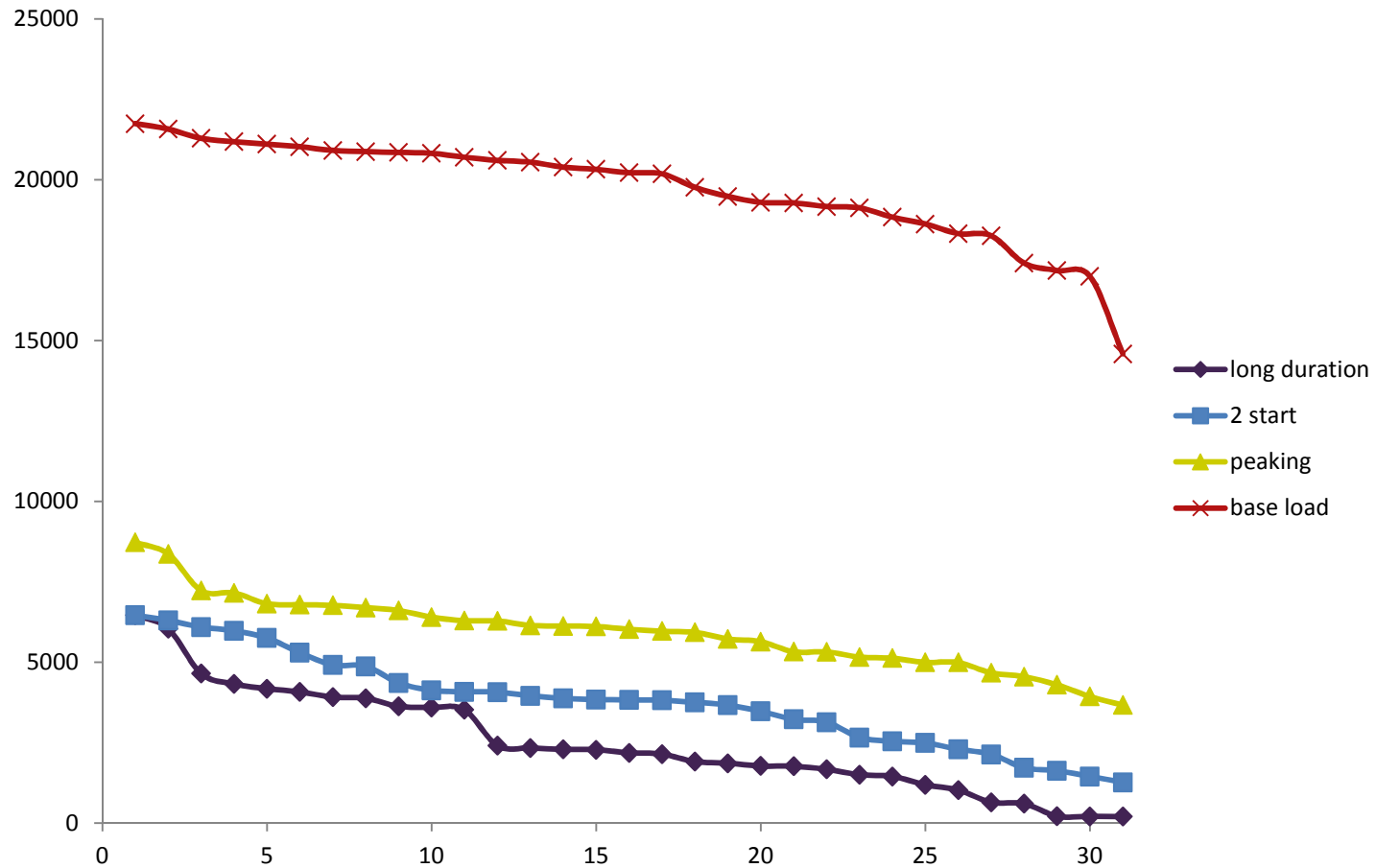


- Peaking, long duration and 2 start may not be separate categories in summer months



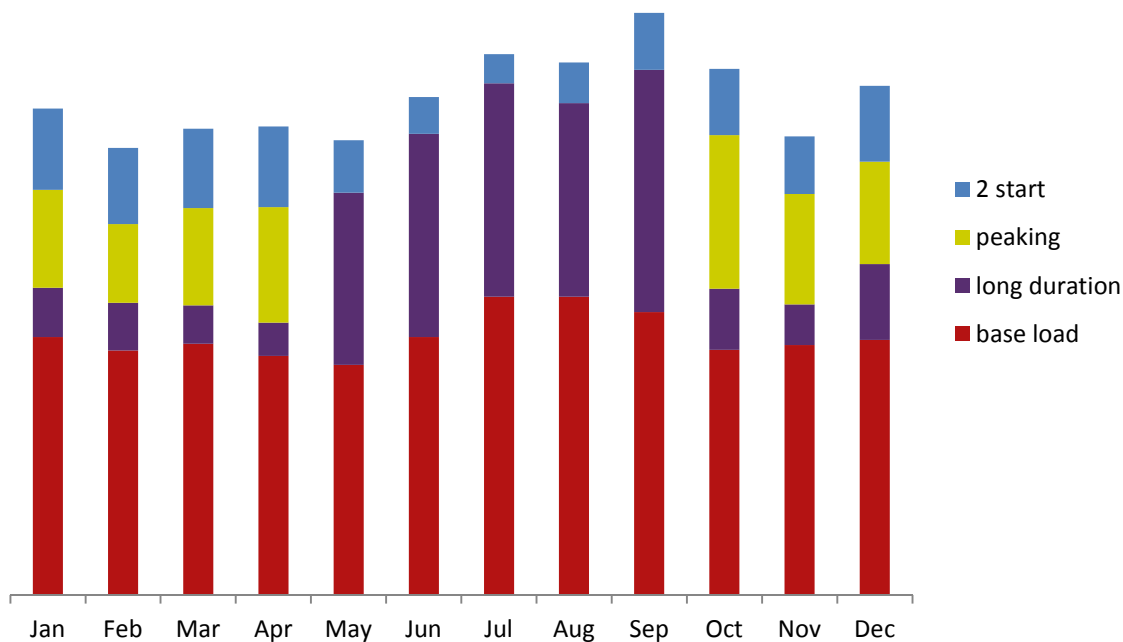


Daily Distribution - December





Illustrative System/Flexible Calculated Categories



- Not scaled to PRM
- Worst Case Scenario for Need – have to examine need on any single day and how to cap at total system need
- 2 start requirement may be unnecessary in summer
- Additional analysis needed to determine bidding requirements





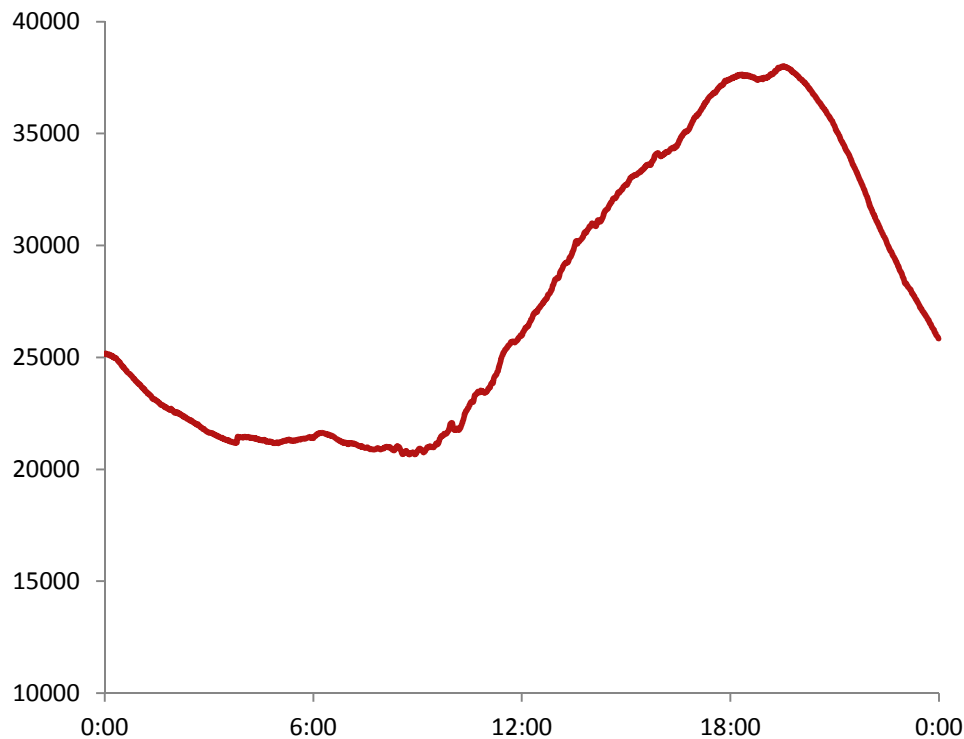
Must-Offer Obligations based on alternative capacity categories?

Capacity Category	Must Offer Obligation
Baseload	Bid or self-schedule (same as current generic requirement) ?
Long Duration	Bid or self-schedule ?
Peaking	5? hour must offer ?
2 start	17? Hour must offer?





Options for Durable Flexible Product



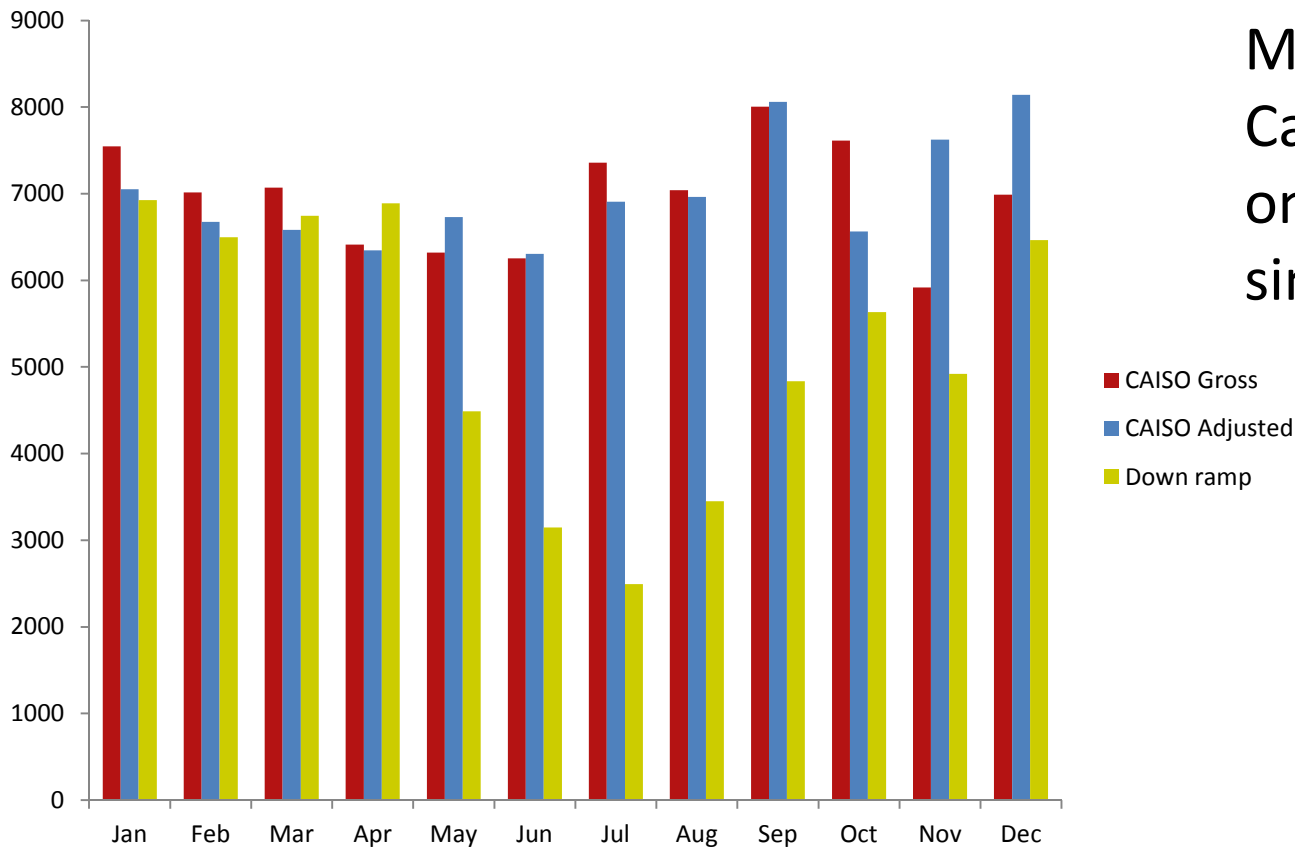
- Alternative 1: Minor Adjustments –
- Revise methodology for Category 1 so that secondary peak must be on a day with 2 ramps of a certain size
- No 2 start requirement May - September





Options for Durable Flexible Product

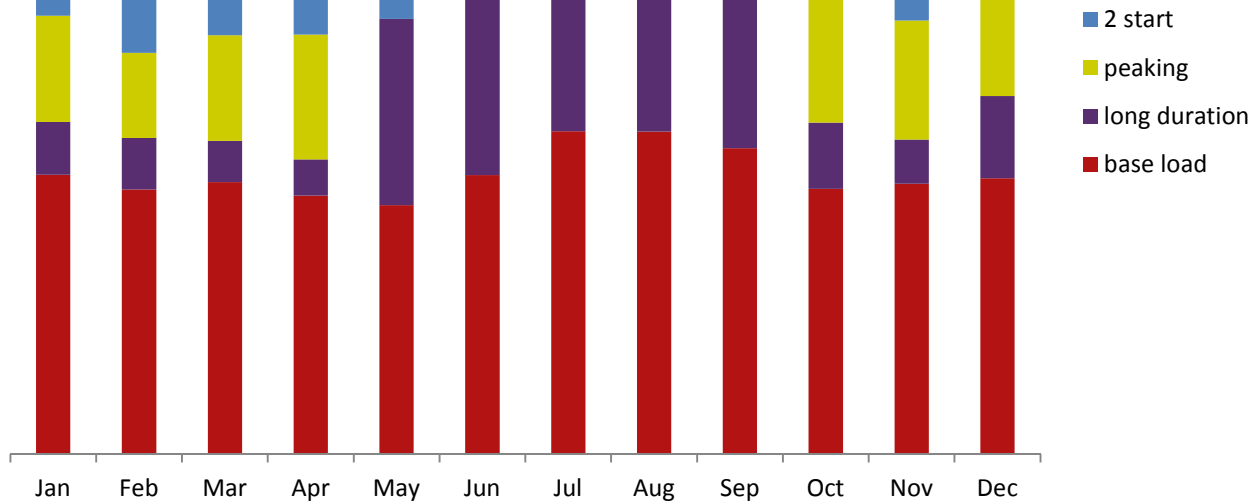
Alternative 2:
 Medium Change -
 Category 1 based
 on down ramp or
 similar





Options for Durable Flexible Product

Alternative 3: Major Redo of System and Flexible RA based on need for specific resource types





Questions and Discussion

- Reaction from parties on options & alternative methodologies presented for Category 1?
- Which are worth pursuing in Track 2 in 2016/ 2017?

Next Steps: further analysis required to develop alternatives, additional workshops and Staff/ party proposals





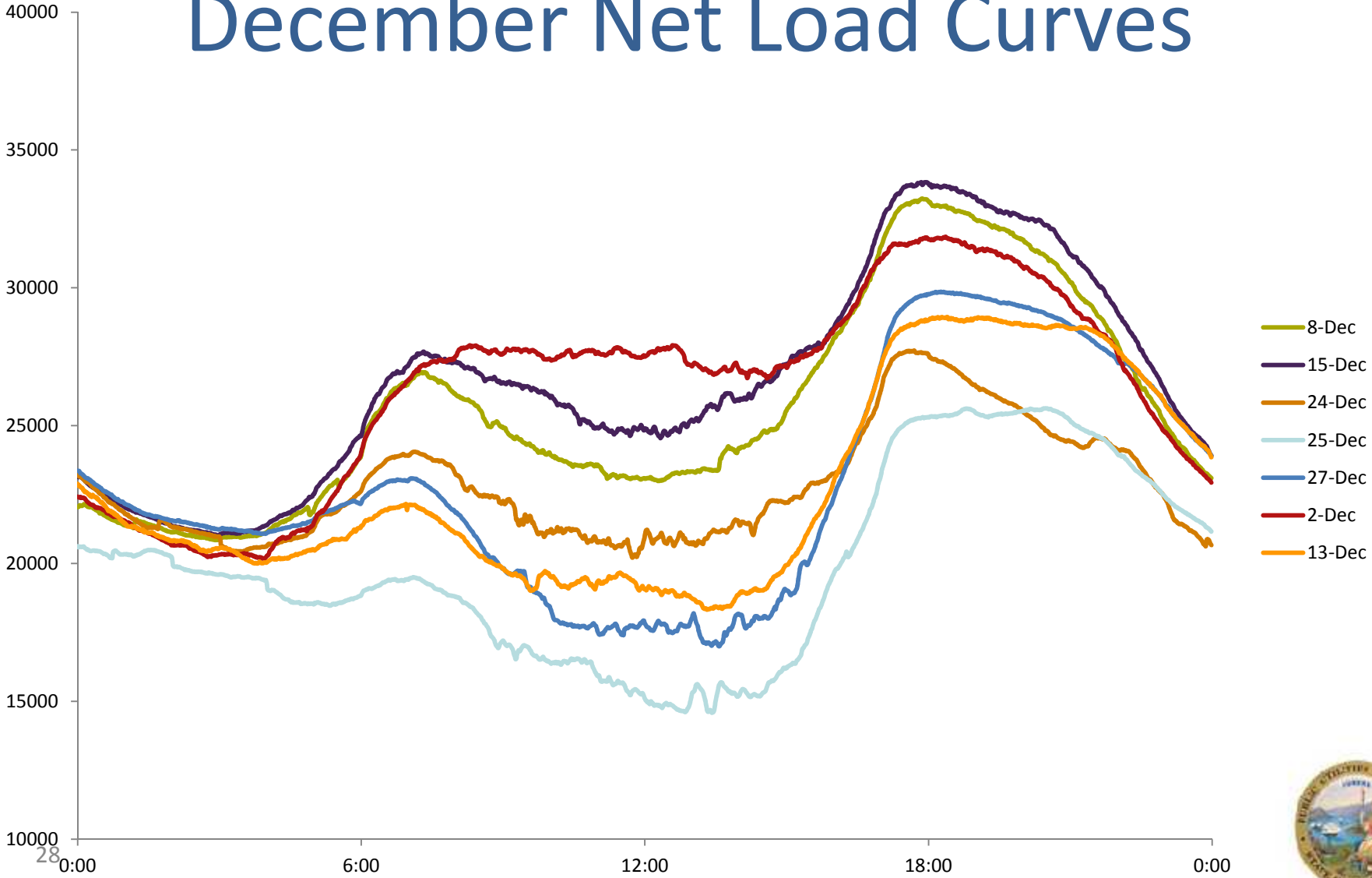
Thank you!
For Additional Information:

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415-703-5239





December Net Load Curves



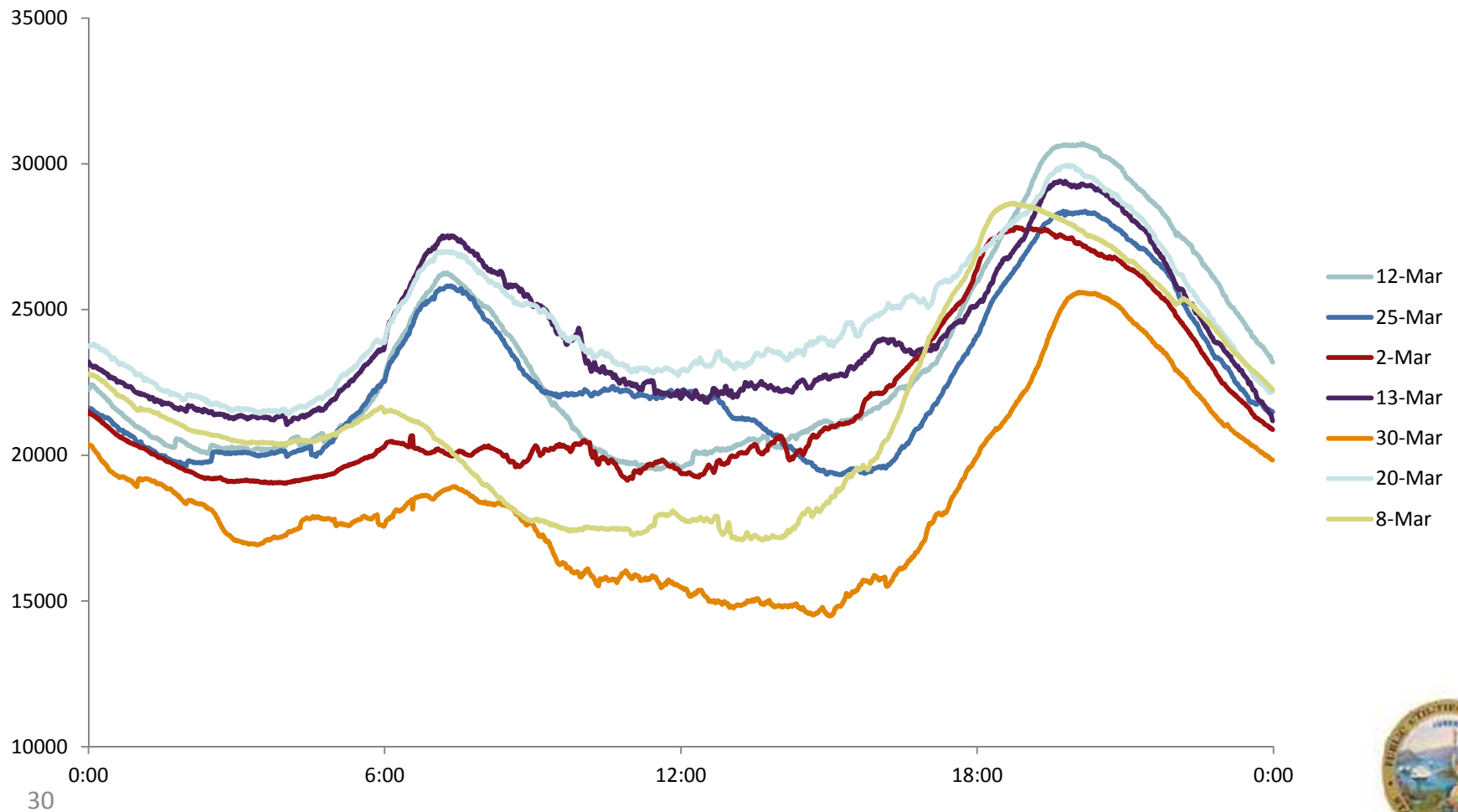


Appendix Slides





March Net Load Curves





Background of MCC Buckets

Donald Brooks, Energy Division

Current Requirements

- 5 Buckets of Resources – differentiated by contracted limits
- Same percentages apply each month, all maximum portfolio limits

Procedural History

- Attempt to reorganize in 2012, result in recalculation but maintaining same structure
- Added DR Bucket in 2012

Potential Realignment that combines Flexible Categories with limit on Base load (inflexible) generators





Background – Where are we now?

- D.05-10-042 adopted a combination of bottom up and top down categories.
- Buckets were differentiated by contractual hours of availability and all resources were required to prioritize availability in peak hours
- Buckets were designed around existing standard energy products





Current MCC Buckets

Summary of Resource Categories		Maximum Cumulative Percentage
Category	Resources fall into categories based on hours of availability. All resources are expected to be available over peak.	
DR	Demand Response resources available for \geq to 24 hours per month.	Unlimited
1 – 5x4 products	\geq the ULR [Use Limited Resource] by month – 30 hours in May, 40 hours in June, 40 hours in July, 60 hours in August, and 40 hours in September, which total 210 hour and have been referred to as “the 210 hours.”	Bucket 1 - 16.21%
2 – 5x8 products	\geq 160 hours per month	Bucket 1 + 2 – 21.71%
3 – 6 x 16 products	\geq 384 hours per month	Bucket 1 + 2 + 3 = 33.76%
4 7x24 products	All Hours of Month (7x24 - planned availability is unrestricted)	Bucket 1 + 2 + 3 + 4 = 100%





Current Methodology

Old definitions:

- Broad methodology adopted in D.05-10-042
- Analysis conducted and Implemented by Energy Division staff in December 2005
- Based on load duration curve made up of average ranked month specific loads from last three years
- Need to accommodate existing energy contracts

Possibilities for revisions

within current methodology:

- Standard energy contracts outdated and phased out
- Hours of availability do not adequately characterize dispatchability or other technical operating limits
- Since Flexible RA paradigm, portfolios have become more complicated
- Possible value in products that last shorter than four hours





Broad Outline of Durable Flexible Realignment

Elements to remove

- MCC Bucket structure
- MW based Flexible RA obligation
- Flexible RA Categories

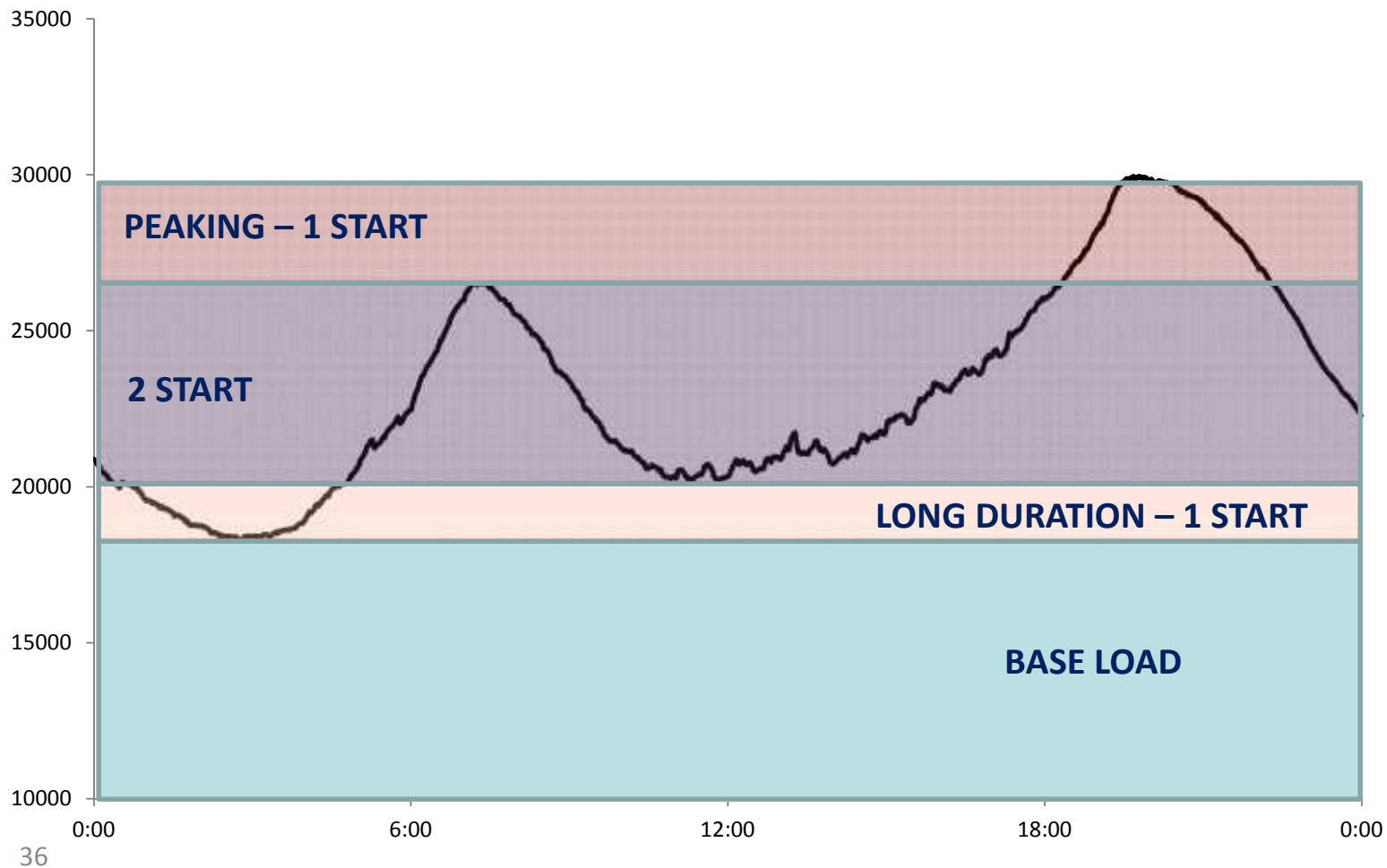
Elements to add

- Portfolio limits for non-flexible resources
- Portfolio minimums for flexible RA categories
- Minimums and limits change each month
- RA Capacity still totals System RA obligation



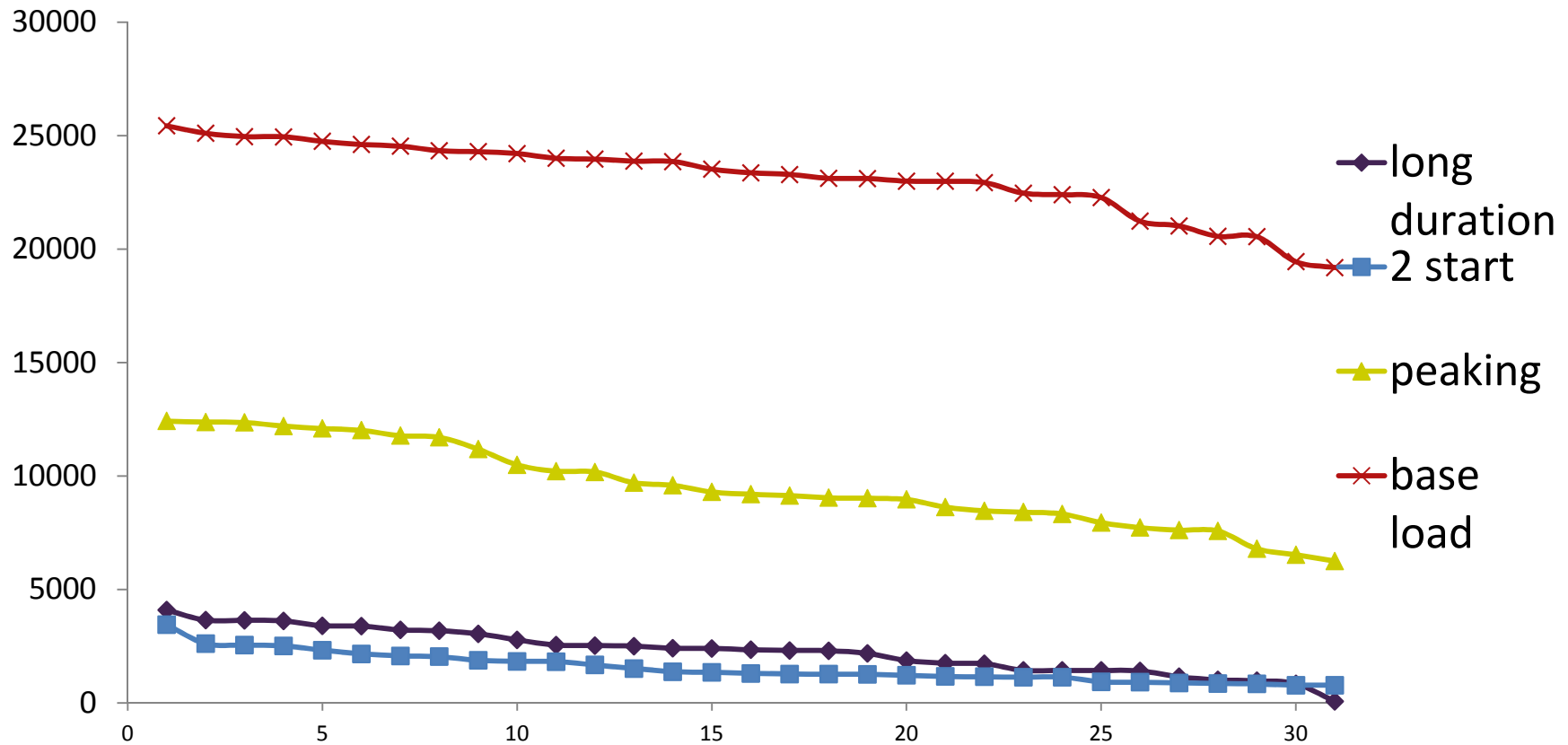


Four Categories





Daily Distribution - September



- Peaking, long duration and 2 start may not be separate categories in summer months





Elements of Realignment

- Four categories
 - Limit on non-flexible resources (self-scheduling)
 - Minimum level of long running rampable and short running rampable resources (1 start) resources
 - Portfolio requirements are monthly dependent on net load curves
 - ED staff can analyze previous five (or more) years of net load curves, scaled to wind/solar installation and peak load levels
 - ED staff can analyze requirements given production of non-dispatchible baseload resources





Resource Categories

- Maximum Category 1 – non-flexible non-bidding – resources that self schedule and don't readily ramp much (nuclear, non-dispatchable CHP, geothermal)
- Minimum Category 2 – resources with significant ramping room or start twice per day
- Minimum Category 3 – resources that are able to start more than once per day but maybe run short periods of time (peakers)
- Maximum Category 4 – peak only resources – one contracted start and very little available energy (DR, storage)





Broad Outline of Annual Analysis

- ED staff will analyze previous five years (or more) of daily net load shapes scaled to current wind/solar installation levels and current peak load
- Calculate distribution of monthly category limits, rank category limits from highest to lowest
- Set category maximums and minimums at point on curve (95%? 75%? Etc.)
- Loads and wind/solar production curves derived from either ISO analysis or production/load profiles developed for SERVM analysis





Next Steps

- ED staff does not have a proposal now – possible outline but more analysis is needed before proposal is complete
- ED staff will develop proposal over summer with intent to issue later for consideration before end of 2016
- Additional analysis on peaking needs and duration of peak

