

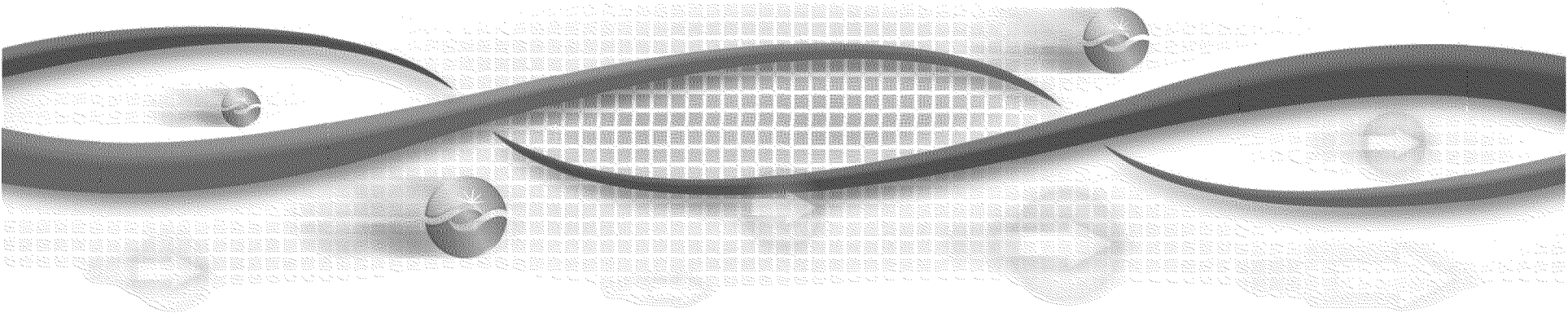


California ISO
Shaping a Renewed Future

Methodology for Determining Flexible Capacity Procurement Requirements

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Methodology for determining flexible capacity procurement requirements

- CPUC/CEC LTPP Portfolios
 - Work with IOUs to choose a portfolio that best represents their RPS trajectory
- Methodology for 2014 through 2016
 - Develop 1-minute data by RPS CREZs
 - Calculate intra-hour flexibility needs
 - Calculate maximum monthly reserve requirements
- Calculating maximum continuous ramp
- Calculate maximum 3-hour ramps

Recommended methodology for determining monthly flexible capacity – Interim proposal

- Methodology

$$\text{Flexibility Need}_{\text{MTHy}} = \text{Max}[(3\text{RR}_{\text{HRx}})_{\text{MTHy}}] + \text{Max}(\text{MSSC}, 3.5\% * \text{E}(\text{PL}_{\text{MTHy}})) + \varepsilon$$

Where:

$\text{Max}[(3\text{RR}_{\text{HRx}})_{\text{MTHy}}]$ = Largest three hour contiguous ramp starting in hour x for month y

$\text{E}(\text{PL})$ = Expected peak load

MTHy = Month y

MSSC = Most Severe Single Contingency

ε = Annually adjustable error term to account for load forecast errors and variability

- Methodology beyond 2016 needs to be developed

Joint Parties proposed flexible capacity counting conventions for non-hydro

Start-up time greater than 90 minutes

$$\text{EFC} = \text{Minimum of (NQC-Pmin) or (180 min * RRavg)}$$

Start-up time less than 90 minutes

$$\text{EFC} = \text{Minimum of (NQC) or (Pmin + (180 min - SUT) * RRavg)}$$

Where:

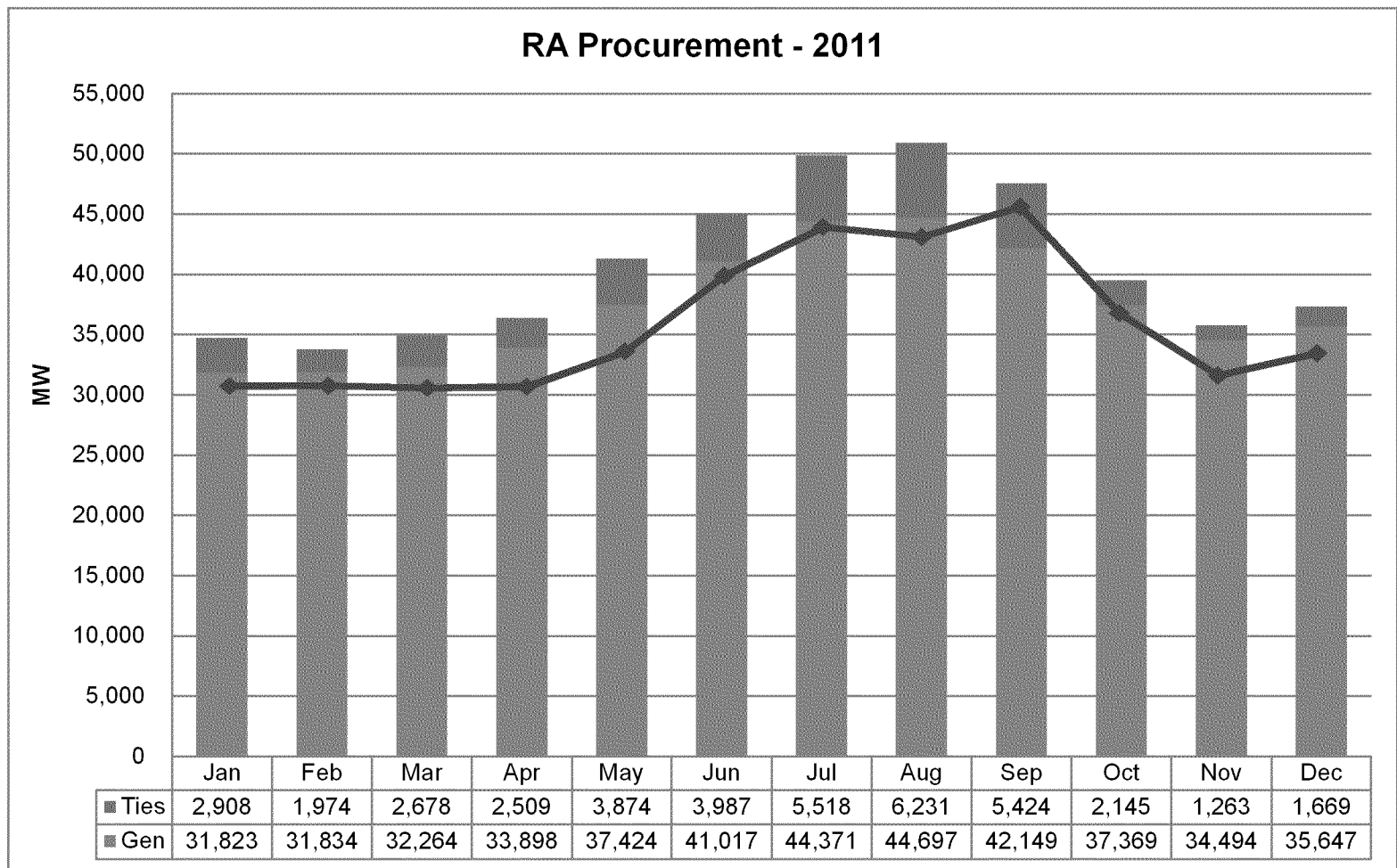
EFC: Effective Flexible Capacity

NQC: Net Qualifying Capacity

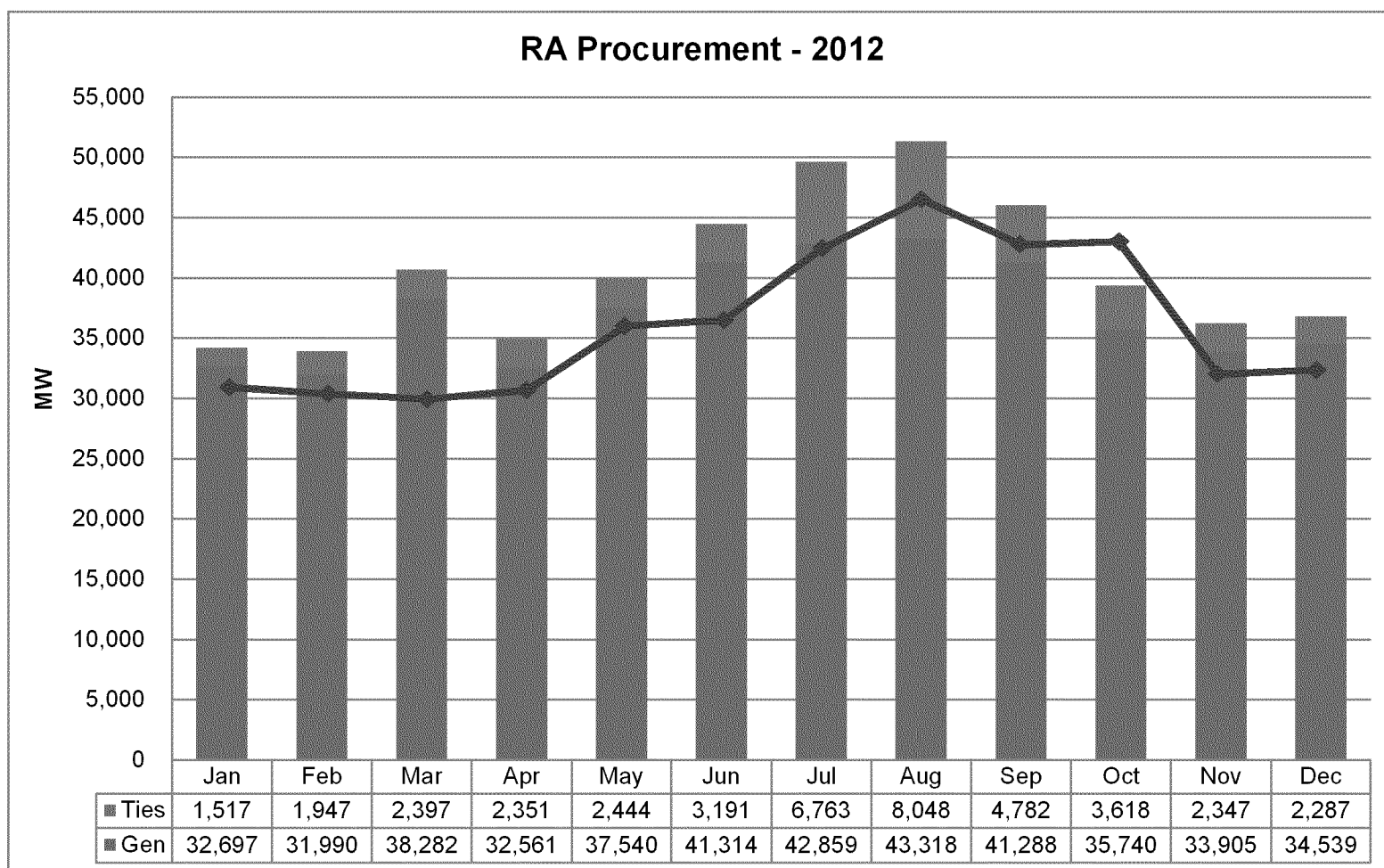
SUT: Start up Time

RRavg: Average Ramp Rate

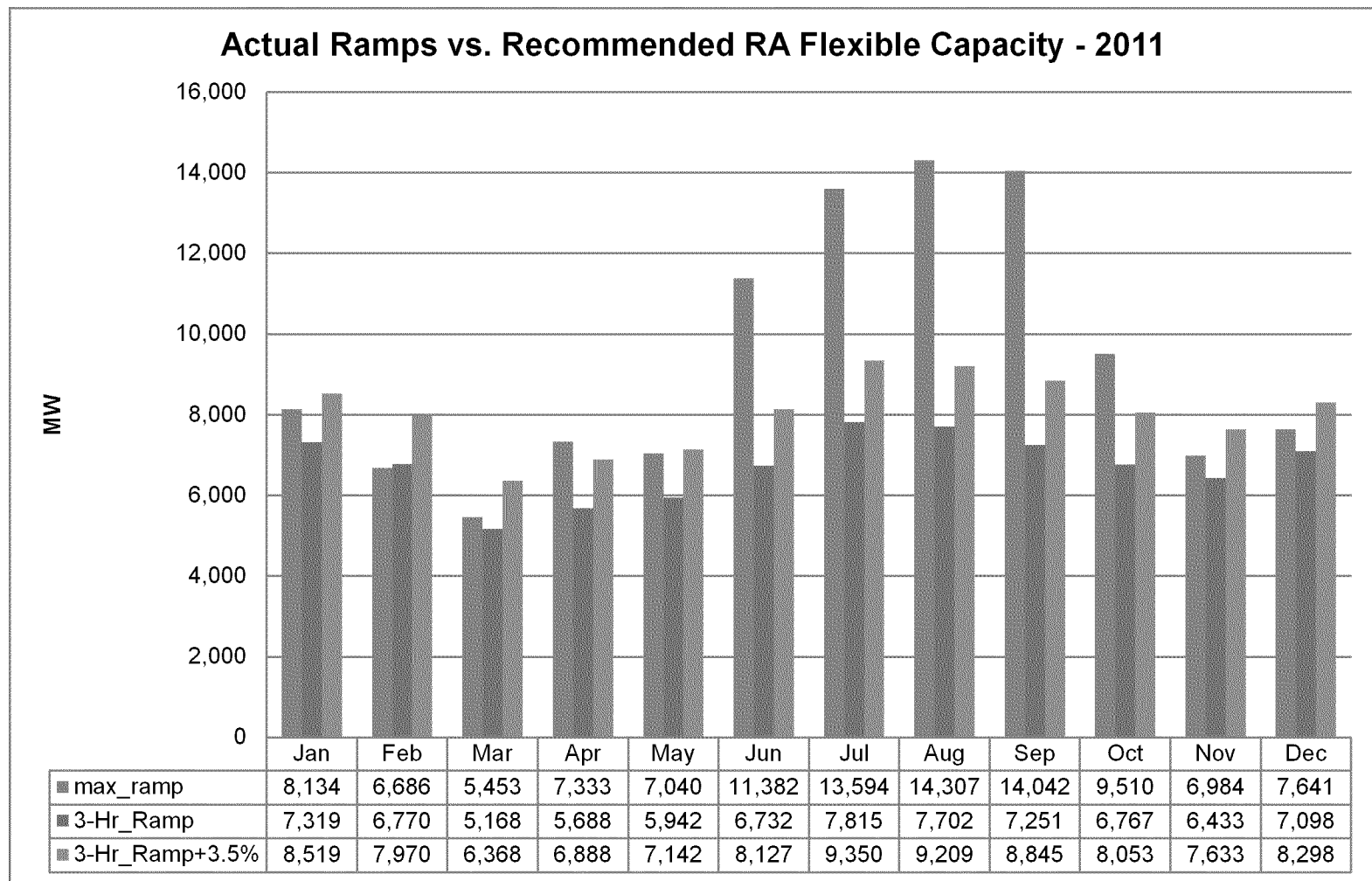
Monthly RA Procurement & Peak Load – 2011



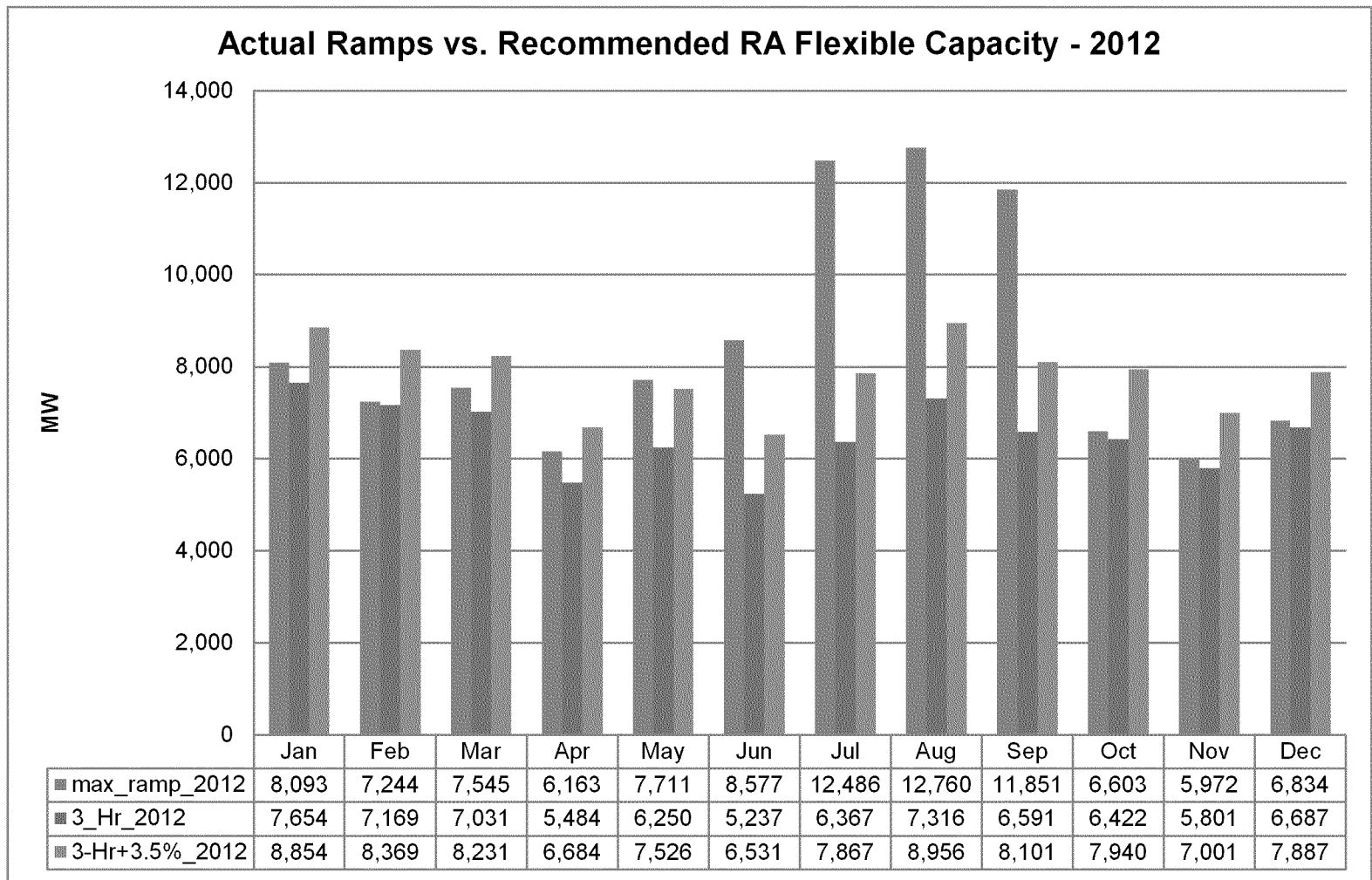
Monthly RA Procurement & Peak Load – 2012



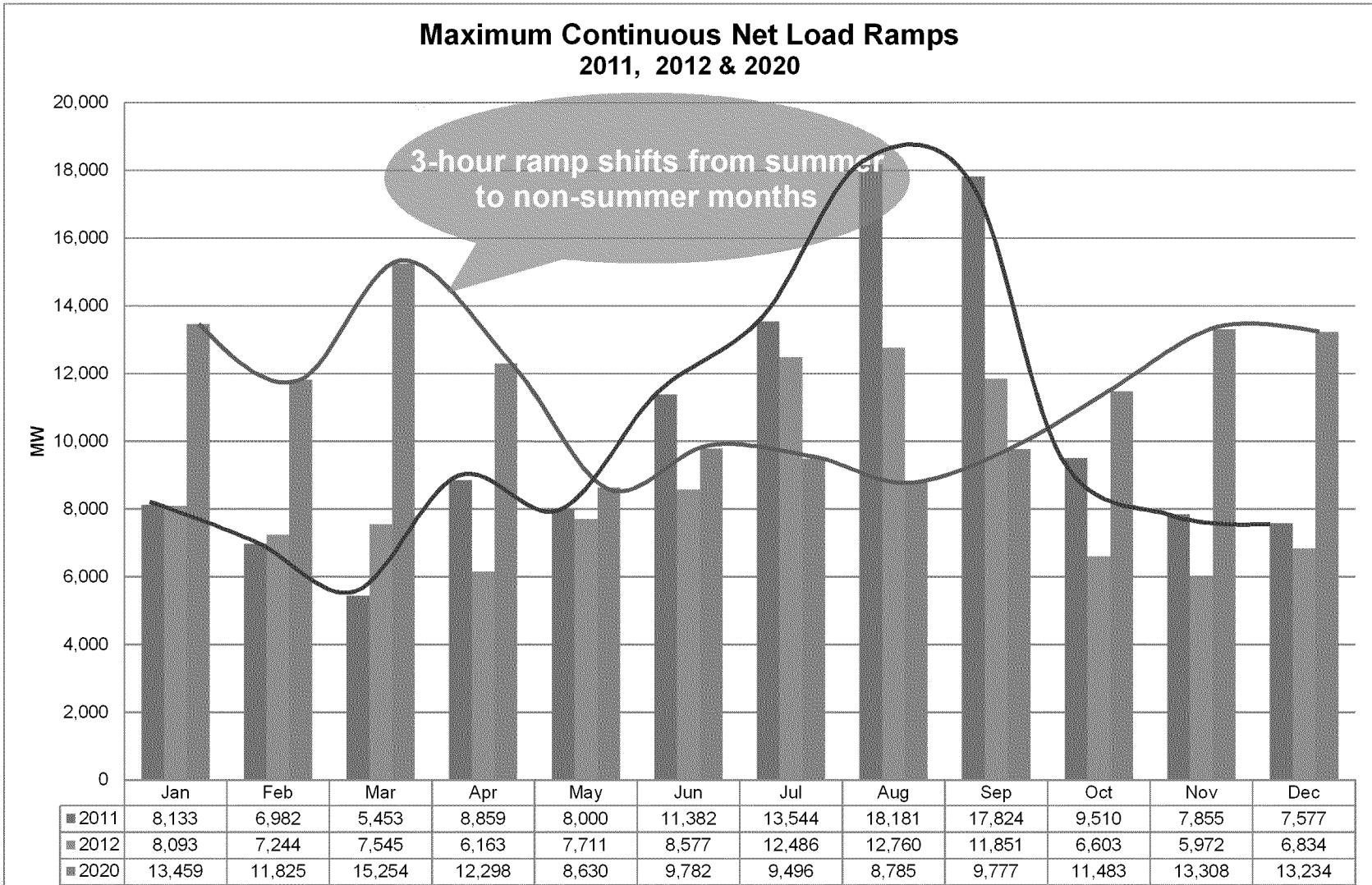
Actual Ramps vs. Recommended RA Flexible Capacity - 2011



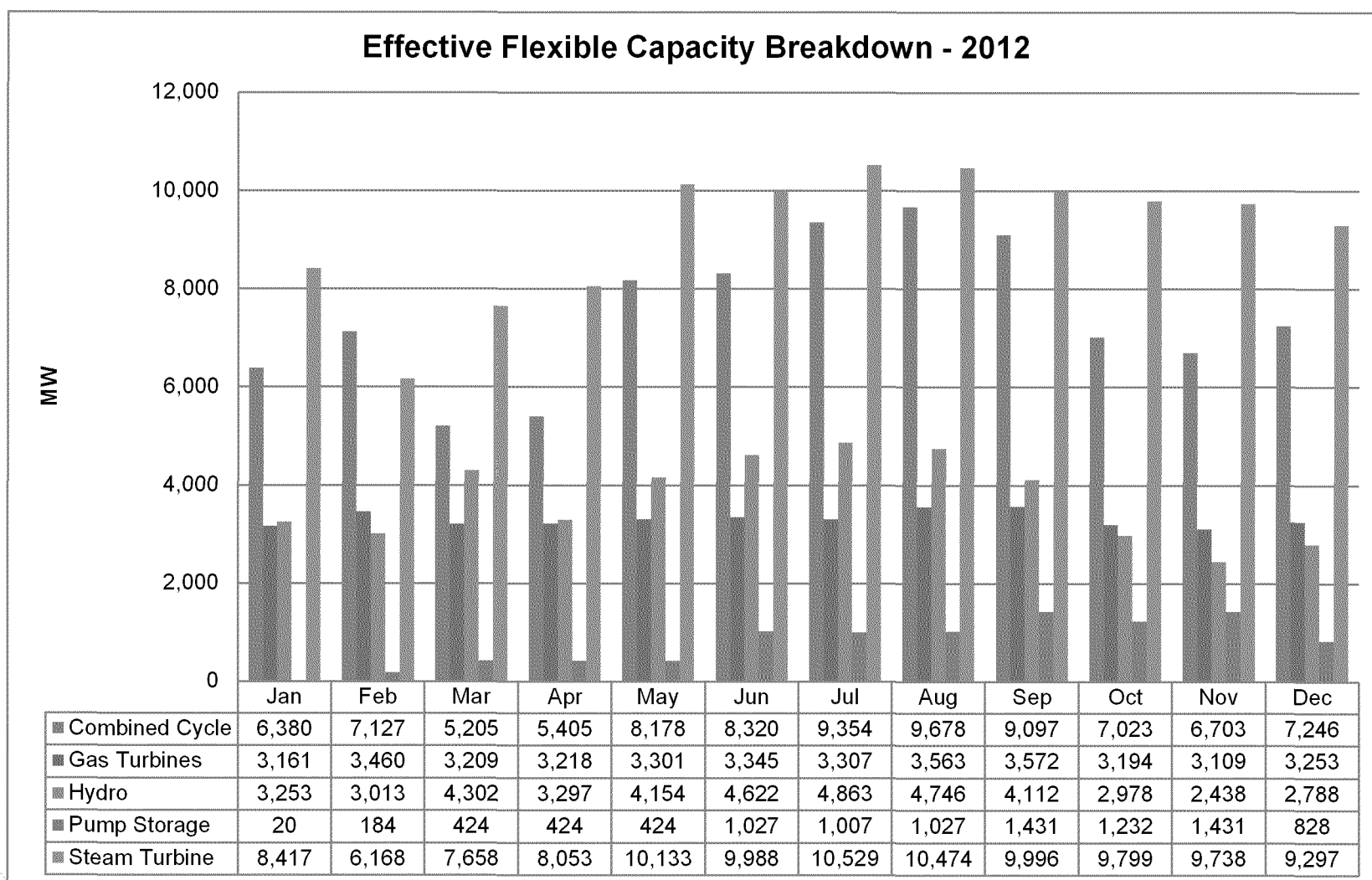
Actual Ramps vs. Recommended RA Flexible Capacity - 2012



Maximum Continuous Net Load Ramps 2011, 2012, 2020

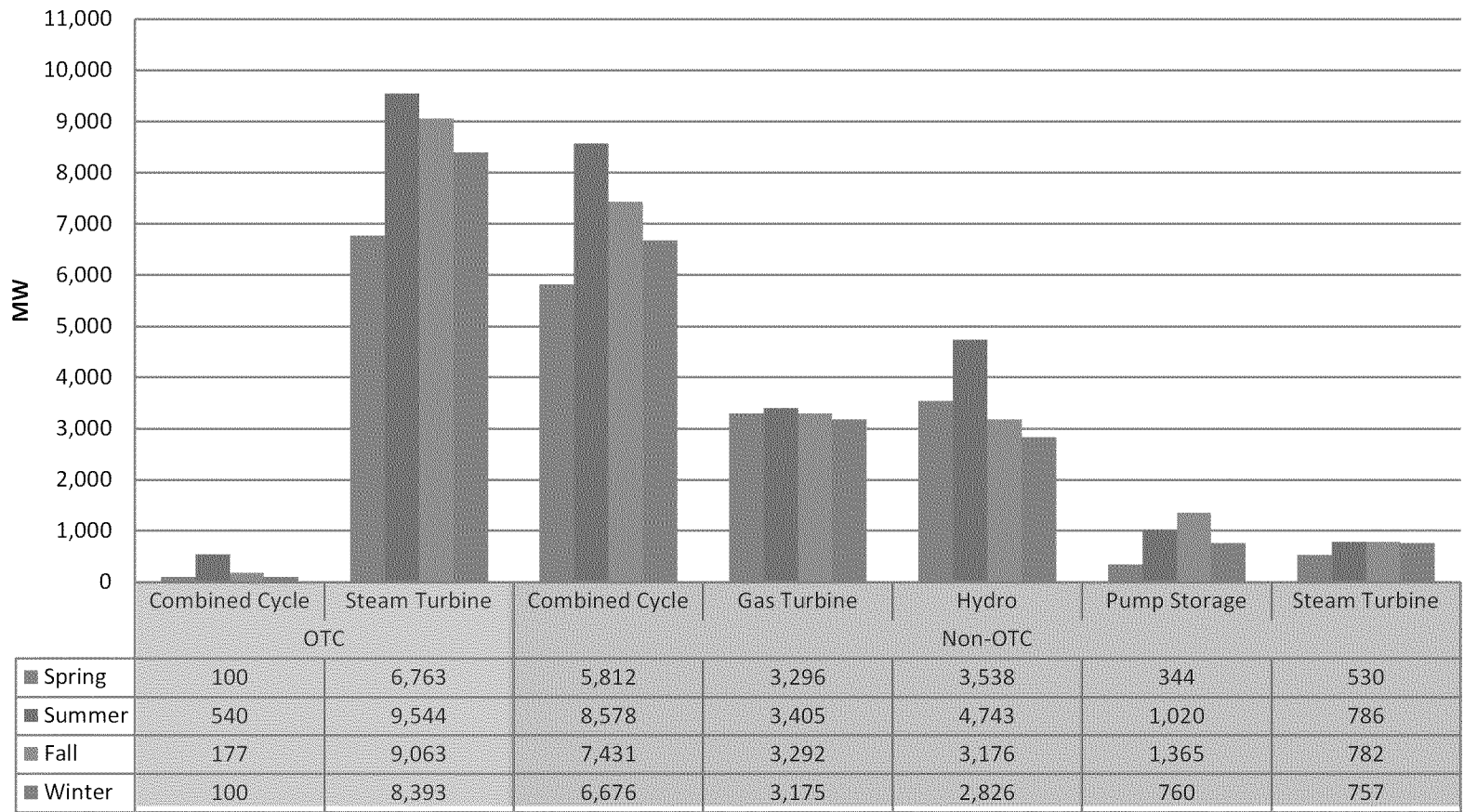


Monthly breakdown of available flexible capacity - 2012

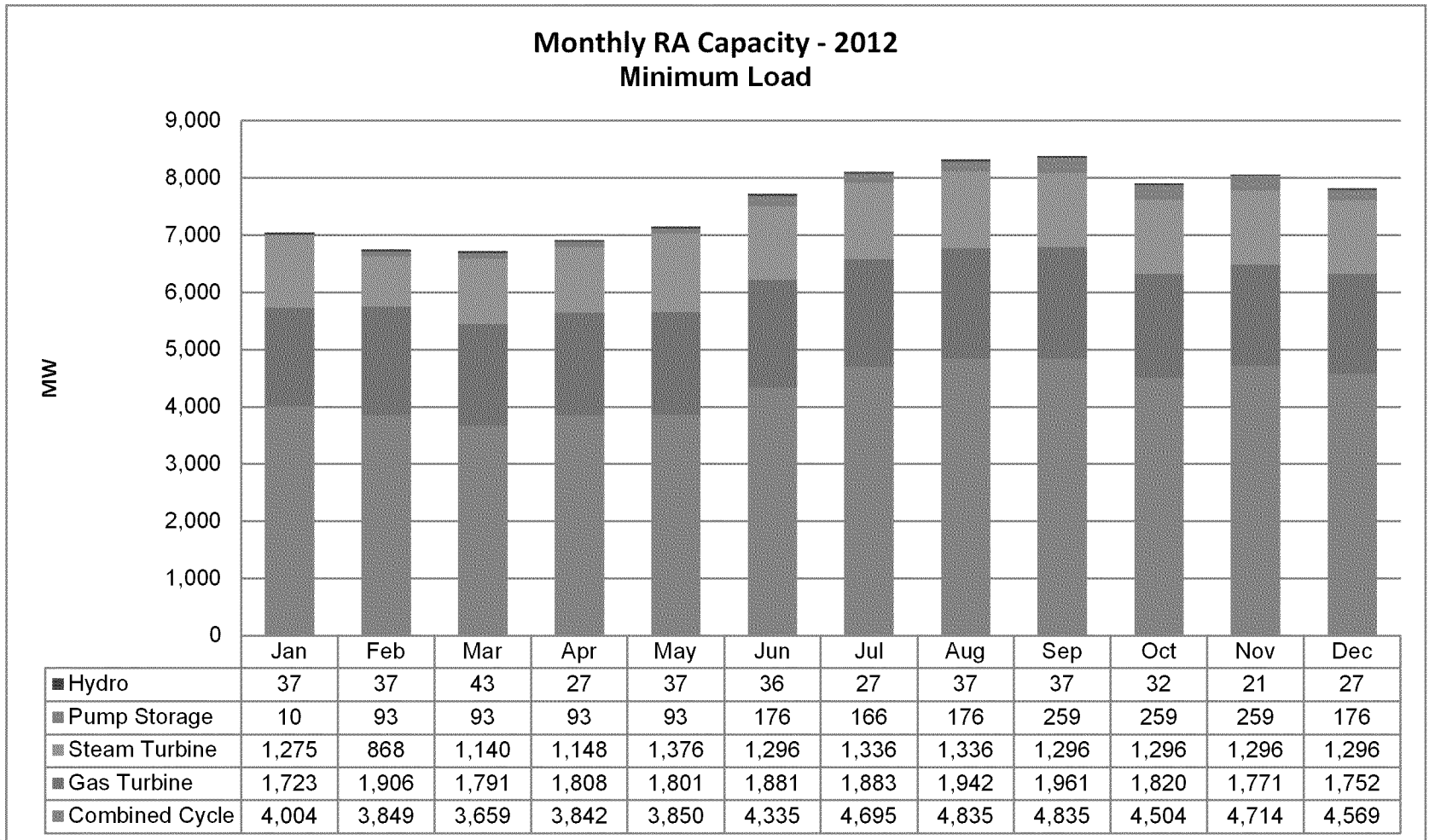


Monthly breakdown of available flexible capacity - 2012

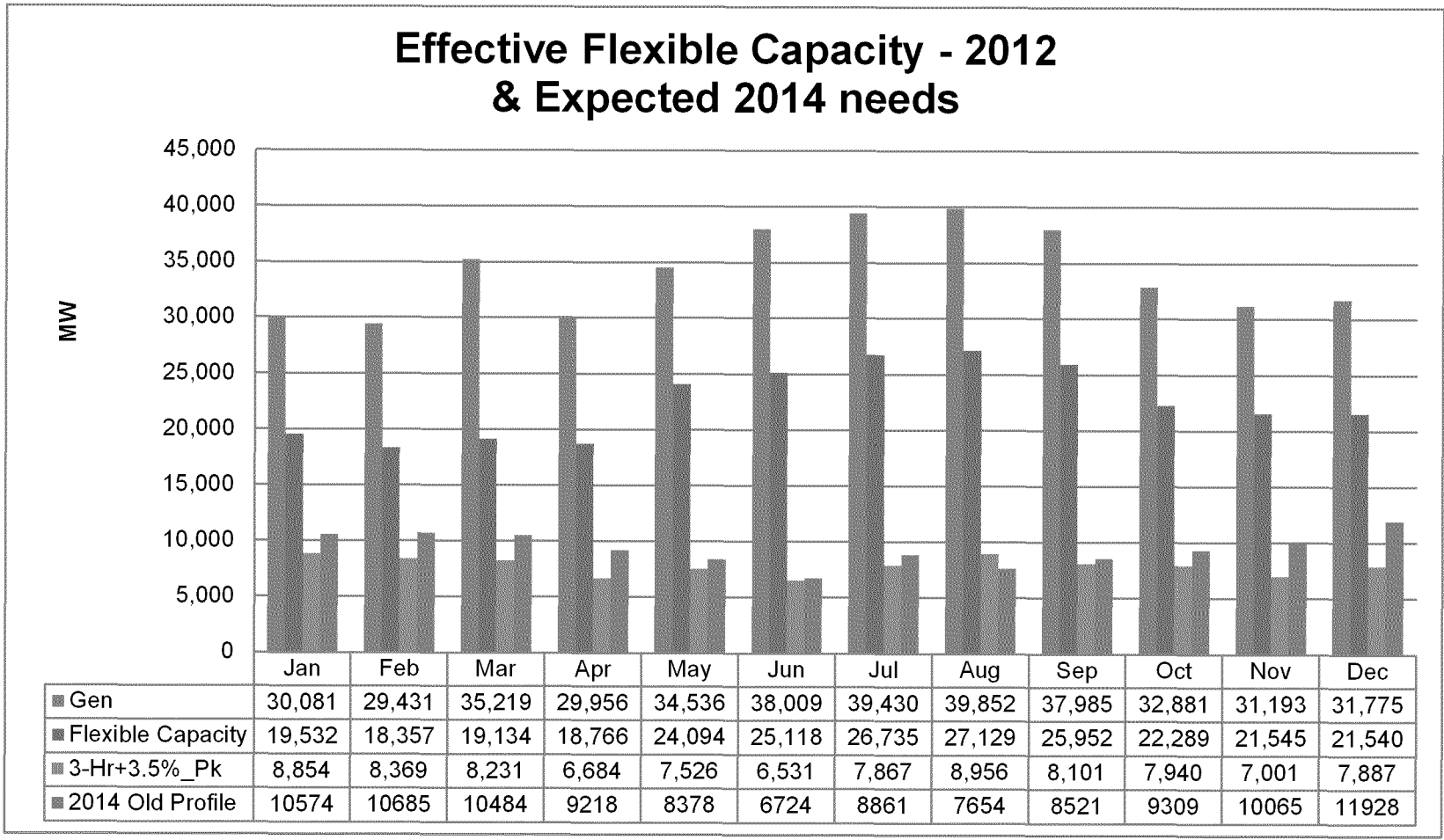
Effective Flexible Capacity - 2012
OTC vs. Non-OTC



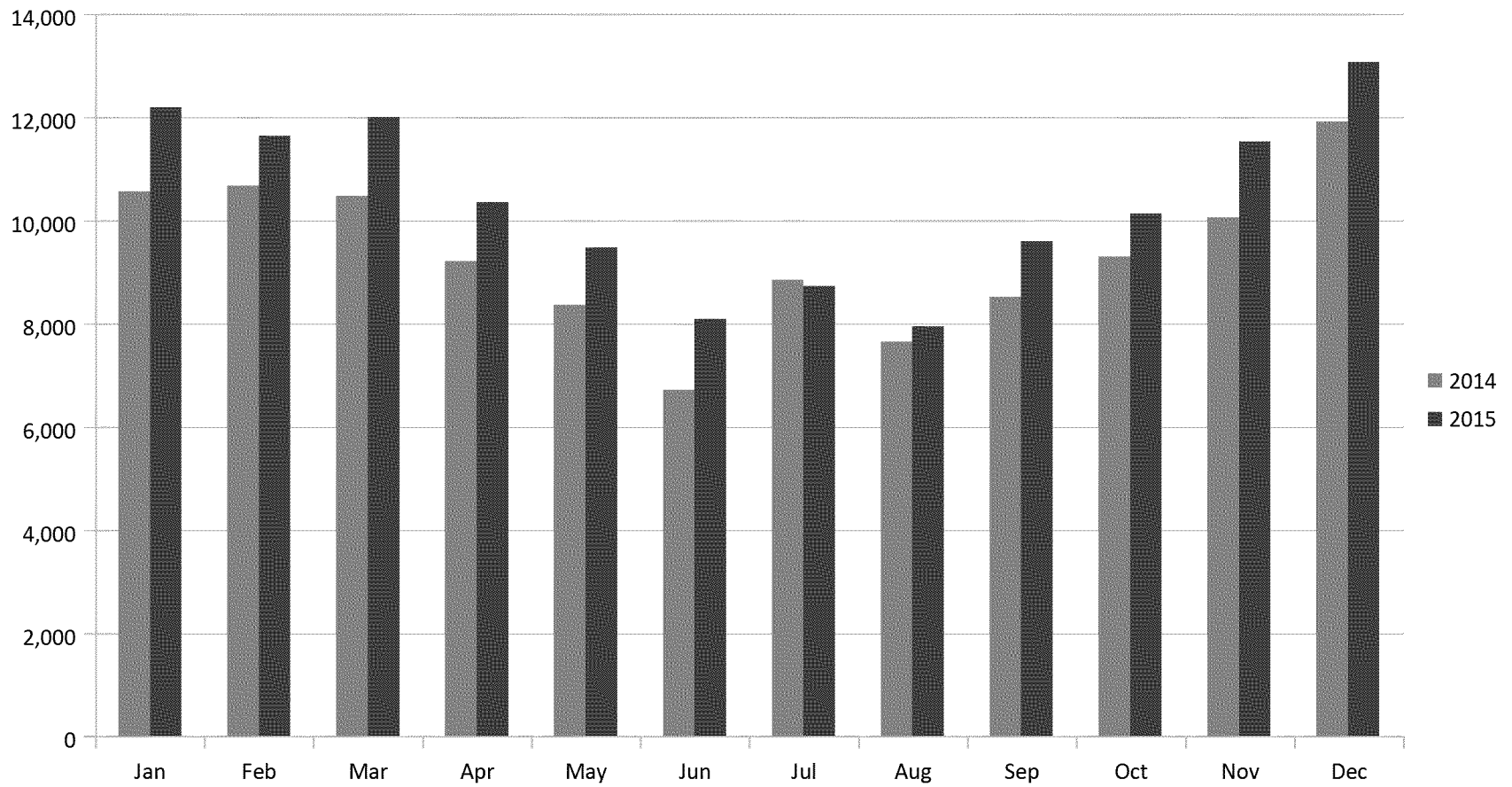
Pmin of Monthly RA capacity - 2012



Available EFC (less 8% for forced outages & forecast errors) vs. Required Flexible Capacity - 2012



Estimated flexible capacity needs for 2014 and 2015 using 2020 RPS portfolios and profiles



Contact information

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