Peaks for September 2019

44,158 MW
Peak demand
September 3
Previous month:
44,301 MW

14,747 MW
Peak served by renewables
September 9
Previous month:
14,766 MW

11,090 MW
Solar peak
September 10
Previous month:
11,193 MW

4,675 MW
Wind peak
September 27
Previous month:
4,739 MW

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Historical stats & records

11,473 MW
Solar peak
July 2, 2019 at 12:53 P.M.
Previous record:
11,435 MW on July 1, 2019

5,309 MW
Wind peak
May 8, 2019 at 3:21 P.M.
Previous record:
5,193 MW on June 8, 2018

78%
Demand served by renewables
April 20, 2019 at 12:40 P.M.
Previous record:
73.9% on May 26, 2018

50,270 MW
Peak demand
July 24, 2006 at 2:44 P.M.
Next highest:
50,116 MW on September 1, 2017

15,639 MW
Steepest ramp over 3-hour period
January 1, 2019 at 2:25 P.M.
Next steepest:
15,070 MW on March 17, 2019 at 4:07 p.m.

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Western Energy Imbalance Market (EIM) benefits
Read ISO EIM Benefits Report Q2 here

ECONOMIC
2019 Q2 benefits: $86 million
Total benefits: $736.26 million since 2014 launch

ENVIRONMENTAL
Q2 avoided curtailments: 132,937 MWh
Q2 ISO GHG savings: 56,897 mTCO₂
Total ISO GHG savings: 403,546 mTCO₂
from avoided curtailment since 2014
Equivalent to removing emissions from 84,844 passenger cars
### Demand & resources (as of 10/01/2019)

Resource adequacy net qualifying capacity (NQC) = **50,898 MW**

*Does not include current outages*

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### Renewable resources (as of 10/01/2019)

**Renewables breakdown**

53.9% solar

28.8% wind

7.7% geothermal

5.3% small hydro

3.8% biofuels

0.6% storage battery

**Megawatts**

- **Solar** 12,572
- **Wind** 6,714
- **Small hydro** 1,244
- **Geothermal** 1,785
- **Biofuels** 880
- **Storage battery*** 136

**TOTAL** 23,331

*Includes stand-alone and hybrid units.

**See Today’s Outlook**

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### Wind and solar curtailment totals

**For more on oversupply, visit here.**

<table>
<thead>
<tr>
<th>Month</th>
<th>Megawatt hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan</td>
<td>50,000</td>
</tr>
<tr>
<td>Feb</td>
<td>100,000</td>
</tr>
<tr>
<td>Mar</td>
<td>150,000</td>
</tr>
<tr>
<td>Apr</td>
<td>200,000</td>
</tr>
<tr>
<td>May</td>
<td>250,000</td>
</tr>
<tr>
<td>Jun</td>
<td>50,000</td>
</tr>
<tr>
<td>Jul</td>
<td>100,000</td>
</tr>
<tr>
<td>Aug</td>
<td>150,000</td>
</tr>
<tr>
<td>Sep</td>
<td>200,000</td>
</tr>
</tbody>
</table>

**September = 59,637 MWh**

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### Steepest ramp over 3-hour period

As daily demand for energy increases and solar generation decreases, grid operators must call on flexible resources to meet the upward ramp in demand. For more on ramping, visit here.

**12,758 MW**

Sep 29 starting at 3:53 p.m.

**Previous months:**

- 11,981 MW on Aug 18 starting at 4:09 p.m.
- 10,981 MW on Jul 8 starting at 4:37 p.m.
- 12,744 MW on Jun 9 starting at 4:11 p.m.
**Annual peak demand**

NEW!  
2019: 44,301 MW  
Aug 15 at 5:50 p.m.

2018: 46,427 MW  
Jul 25 at 5:33 p.m.

2017: 50,116 MW  
Sep 1 at 3:58 p.m.

2016: 46,232 MW  
Jul 27 at 4:51 p.m.

**Installed solar growth**

<table>
<thead>
<tr>
<th>Year</th>
<th>Megawatts (MW)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018</td>
<td>11,960</td>
</tr>
<tr>
<td>2017</td>
<td>10,818</td>
</tr>
<tr>
<td>2016</td>
<td>10,157</td>
</tr>
<tr>
<td>2015</td>
<td>7,861</td>
</tr>
<tr>
<td>2014</td>
<td>6,012</td>
</tr>
<tr>
<td>2013</td>
<td>4,822</td>
</tr>
<tr>
<td>2012</td>
<td>1,887</td>
</tr>
<tr>
<td>2011</td>
<td>724</td>
</tr>
<tr>
<td>2010</td>
<td>512</td>
</tr>
<tr>
<td>2009</td>
<td>446</td>
</tr>
</tbody>
</table>

**2018 Energy use (as percentage of total resources available)**

- **Natural gas = 30%**  
  Up 2% from previous year

- **Net imports = 22%**  
  Unchanged from previous year

- **Nuclear = 10%**  
  Unchanged from previous year

- **Total hydro = 10%**  
  Down 7% from previous year

- **Wind = 7%**  
  Up 19% from previous year

- **Non-hydro renewables = 26%**  
  Up 3% from previous year

- **Wind = 7%**  
  Down 2% from previous year

- **Solar = 12%**  
  Up 9% from previous year

- **Biofuels = 2%**, a slight increase from previous year

**Other facts**

- 30 million consumers
- Serve ~80% of California demand
- Serve ~33% of WECC demand
- MWh of load served for 2018 = 232.9 million
- Total estimated wholesale cost of serving demand in 2018 = $10.8 billion or about $50/MWh*
- Total estimated wholesale cost of serving demand in 2017 = $9.4 billion or about $42/MWh*
- 1 MW serves about 750-1,000 homes (1 MWh = 1 million watts used for one hour)
- 18 participating transmission owners
- 25,715 (or about 26,000) circuit miles of transmission
- 217 market participants
- MWh of market transactions for 2018 = 32,635 (2017 = 31,208)
  - Daily average electricity delivered for 2018 = 222.8M MWh
- 9,696 pricing nodes for ISO & all EIM entities as of Apr. 4, 2018. ISO has 4,119 pricing nodes
- Western EIM has 9 active participants serving customers in 8 states (as of April 2019)

*Note higher cost mostly due to higher natural gas prices. After normalizing for natural gas prices and greenhouse gas compliance costs, total wholesale energy costs increased by about 4 percent.