UCI Earth Day Remarks by LADWP

1. Utility Perspectives on Earth Day and Beyond
2. Plug Load increases due to COVID-19 on LA City, California & US

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Plug Load with UCI’s Calit2

Calit2 divisions at UCI and UC San Diego leverage academic expertise with industry experience to benefit society and ignite economic development in the region and state.

Though LADWP’s close partnership with Calit2, our team spreads awareness of wasteful vampire loads and aims to reduce unnecessary plug load, the energy consumption that occurs from appliances plugged into wall outlets. We utilize their research to promote energy efficiency and sustainability by changing appliance controls and consumers’ behavior.
California Will Continue to Grow
2014 to 2030 Projections

California’s population may grow more than 13% by 2030...

In millions

<table>
<thead>
<tr>
<th>Year</th>
<th>Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>'14</td>
<td>38.8</td>
</tr>
<tr>
<td>'20</td>
<td></td>
</tr>
<tr>
<td>'30</td>
<td>44</td>
</tr>
</tbody>
</table>

...and economic output could rise more than 50%...

In trillions

<table>
<thead>
<tr>
<th>Year</th>
<th>Economic Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>'14</td>
<td>2.3</td>
</tr>
<tr>
<td>'20</td>
<td></td>
</tr>
<tr>
<td>'30</td>
<td>3.5</td>
</tr>
</tbody>
</table>

...while climate goals require a smaller carbon footprint.

In metric tons

<table>
<thead>
<tr>
<th>Year</th>
<th>Carbon Footprint</th>
</tr>
</thead>
<tbody>
<tr>
<td>'14</td>
<td>441.5</td>
</tr>
<tr>
<td>'20</td>
<td></td>
</tr>
<tr>
<td>'30</td>
<td>260</td>
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Note: 2020 and 2030 figures are estimates.
Sources: Legislative Analyst’s Office, California Air Resources Board, Public Policy Institute of California and the Center for Continuing Study of the California Economy.

@latimesgraphics
Virtuous Cycle of Emerging Technologies

Emerging Technology R&D (Technology Incubation)

Evaluation, Measurement, and Verification (Utility Program EM&V)

Commercialization (Business Incubation)

Market Adoption (Utility Incentives)

LA DWP

La Kretz Innovation Campus

www.ladwp.com
Plug Load Vision and Mission

Vision: Provide energy efficient solutions for plug load devices to improve control and reduce energy consumption and cost for customers and increase grid capacity for LADWP. To insure that manufacturers of plug load devices incorporate energy and demand reducing technology in all their devices.

Mission: To support efforts to ensure that electronic equipment and appliances will have reduced plug load demand and less wasted energy in accordance with LADWP’s Green City goal by evaluating and promoting plug load energy management devices and control algorithms.
Figure 1. PPLs account for 33% of the total energy consumed by commercial buildings. Graph by Chad Lobato, NREL; Data source: DOE (2010)
CA Residential Plug Load Consumption

- Refrigeration: 20%
- TV, PC, and Office Equipment: 20%
- Dishwasher and Cooking: 4%
- Laundry: 4%
- Miscellaneous: 11%
- Lighting: 22%
- Air Conditioning: 7%
- Water heating: 3%
- Pools and Spas: 7%
- Space heating: 2%

Plug-in equipment now more than 59%

Source: CA Residential Appliance Saturation Survey (RASS) 2010

*LADWP has been collaborating with UCI CalPlug since 2011 on plug loads.*
Increasing Plug Load impact on Grid:

- **Generation**
  - Higher cost
  - Environmental issues

- **Transmission**
  - Limited capacity
  - Increased losses
  - Grid stability
  - Fire risk

- **Distribution**
  - Limited capacity
  - Power quality
  - Reliability
Customer Engagement Lab (CEL) + Sustainable Living Lab (SLL) Demonstration Space
Case Study (Smart) Home

Smart Electric Washer and Dryer

Dural Purpose Air to Water Heat Pump for both space conditioning and Water Heating controlled by Smart Thermostat

Smart Induction Range

Smart Inverter Duty Refrigerator

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Covid-19 Impacts to Plug Loads

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