BOLDLY MOVING TO ZERO

Striving for Zero: LAX Ground Support Equipment Emissions Reduction Program

March 3, 2020
BOLDLY MOVING TO ZERO

• LAWA’s sustainability program focuses on the core environmental aspects of the triple bottom line. The ultimate goal is to zero environmental impacts from the airports’ operations.

• **Zero Carbon Electricity by 2045 for LAX and VNY**

• **Zero Potable Water for non-potable uses such as landscaping and LAX’s Central Utility Plant by 2045**

• **Develop Road Map to Zero Waste Facilities by 2020**

• **Carbon Neutral LAWA Operations by 2045**

• LAWA publishes annual sustainability reports and LAWA’s Board recently adopted the Sustainability Action Plan.
LAWA has one of the largest clean fleets in the nation....and growing!

- **Clean Fuel Programs**
  - **Alternative Fuel Vehicle Requirement** – policy requires commercial medium and heavy duty operators to use clean vehicles at LAX
  - **Ground Service Equipment Emissions Reduction** - policy requires reduction of emissions from GSE; has helped to reduce GSE emissions nearly 45%; GSE Incentive Program and GSE pooling underway
  - **EV Charger Installation** – designing today for as much as 35% of new parking stalls to provide for future charging stations
  - **Gate Electrification** – plan to provide ground power to aircraft at all aircraft parking positions to replace use of jet fuel to power auxiliary power units
Air Quality Initiatives

• Trip Reduction Programs
  o **Encouraging Employee Rideshare** – 23% participate in rideshare
  o **FlyAway** – LAX Dedicated bus fleet from multiple locations across Southern California: nearly 1.9 million riders in 2018

• Clean Construction
  Mitigation measures mandate:
  o Use of cleanest equipment available
  o Designated haul routes and hours of construction
  o Recycling of construction and demolition debris
  o Monitoring to ensure compliance
LAX GSE Emissions Reduction Policy

• Developed GSE Policy in collaboration with airlines and GSE Operators

• 2015 Policy required Operators at LAX to meet statewide CARB target of 2.65 grams per horsepower-hour of hydrocarbons plus nitrogen oxides (g/bhp-h of HC + NOx) at LAX no later than December 31, 2021
  • Target originated with 2006 South Coast GSE MOU
  • Mandate to develop a policy included in LAX Community Benefits Agreement, 2005

• LAWA updated the Policy in 2019. Updated policy requires operators reduce GSE emission factors to
  • 1.8 g/bhp-h of HC + NOx by Dec. 31, 2022; and
  • 1.0 g/bhp-h of HC + NOx airport-wide emission factor by December 31, 2030

• Policy also requires that operators
  • Must maintain target (no backsliding)
  • Must submit annual report on fleet mix and emissions
## LAX GSE Inventory

<table>
<thead>
<tr>
<th></th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total Airport Equipment</strong></td>
<td>2,325</td>
<td>2,606</td>
<td>2,717</td>
<td>2,608</td>
</tr>
<tr>
<td><strong>Airport Average Emission Factor</strong> (g/bhp-h of HC HC + NOx)</td>
<td>3.31</td>
<td>2.62</td>
<td>2.24</td>
<td>1.94</td>
</tr>
<tr>
<td><strong>Ground Service Providers (# of equipment)</strong></td>
<td>423</td>
<td>438</td>
<td>414</td>
<td>644</td>
</tr>
<tr>
<td><strong>Ground Service Providers Average Emission Factor</strong> (g/bhp-h of HC + NOx)</td>
<td>3.58</td>
<td>3.46</td>
<td>3.48</td>
<td>2.52</td>
</tr>
<tr>
<td><strong>Airlines Equipment (# of equipment)</strong></td>
<td>1,847</td>
<td>1,884</td>
<td>1,647</td>
<td>1,626</td>
</tr>
<tr>
<td><strong>Airlines Average Emission Factor</strong> (g/bhp-h of HC + NOx)</td>
<td>3.01</td>
<td>2.33</td>
<td>1.87</td>
<td>1.81</td>
</tr>
<tr>
<td><strong>Others Equipment (# of equipment)</strong></td>
<td>55</td>
<td>281</td>
<td>656</td>
<td>338</td>
</tr>
<tr>
<td><strong>Others Average Emission Factor</strong> (g/bhp-h of HC + NOx)</td>
<td>3.23</td>
<td>2.04</td>
<td>2.13</td>
<td>1.5</td>
</tr>
</tbody>
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**Airport-Wide hp-Weighted GSE Fleet Average NOx+HC EF by Survey Year**

**LAX Aggregated Nox + HC Emission Factor Trend**
### Electric GSE Contribution to LAX GSE Fleet

<table>
<thead>
<tr>
<th>Year</th>
<th>% Elec</th>
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<tbody>
<tr>
<td>2006</td>
<td>24</td>
</tr>
<tr>
<td>2013</td>
<td>37</td>
</tr>
<tr>
<td>2015</td>
<td>39.8</td>
</tr>
<tr>
<td>2016</td>
<td>41</td>
</tr>
<tr>
<td>2017</td>
<td>38.7</td>
</tr>
<tr>
<td>2018</td>
<td>35.2</td>
</tr>
</tbody>
</table>

#### Percent of Reported GSE Fleet Powered by Electricity by Survey Year

![Graph showing the percent of GSE fleet powered by electricity from 2005 to 2019.](image-url)
Reduced Emissions

<table>
<thead>
<tr>
<th>Year</th>
<th>NOx Emissions (tons per year)</th>
<th>% Reduction from 2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017 (baseline)</td>
<td>184.91</td>
<td>---</td>
</tr>
<tr>
<td>2023</td>
<td>150.71</td>
<td>18%</td>
</tr>
<tr>
<td>2031</td>
<td>121.31</td>
<td>34%</td>
</tr>
</tbody>
</table>

To date, the GSE Policy has helped reduce the airport-wide GSE emission factor by 1.39 g/bhp-hr, equivalent to removing approximately 176,000 PASSENGER VEHICLES DAILY.
Additional GSE Programs/Next Steps

- LAWA Adopted a **Zero-Emission GSE Incentive Program** in 2019
  - LAWA will provide $500,000 in funding to help operators replace conventionally-fueled equipment with zero-emission equipment
  - Program is currently over 50% subscribed

- LAWA is developing a **GSE Pooling Program** for common use gates
  - Airlines and GSE Operators will share equipment that will remain at the gate
  - Expected to reduce the number of GSE on the airfield and the need to relocate equipment after every flight

- LAWA will be conducting a **GSE Electric Infrastructure Study** to determine need for and location of GSE charging infrastructure at the gates