Assembly Bill 617: BARCT – Miscellaneous Combustion Units

Community Advisory Council
Santa Barbara County
Air Pollution Control District

Our Mission: To protect the people and the environment of Santa Barbara County from the effects of air pollution.

Aeron Arlin Genet
Executive Director / Air Pollution Control Officer

Tim Mitro, Air Quality Engineer
August 23, 2023

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Presentation Topics

1) Background Information
   - Assembly Bill 617 – Best Available Retrofit Control Technology (BARCT)
   - Misc. Combustion Equipment Units & Control Technologies

2) BARCT Analysis for Miscellaneous Combustion Units
   - Emission Standards
   - Cost-Effectiveness
   - Implementation of BARCT
Background: Assembly Bill (AB) 617

- Enacted in 2017 for Community Air Protection.

- BARCT applies to large industrial facilities subject to Cap-and-Trade.
  - >25,000 metric tons/yr of GHGs as of 1/1/2017.
  - Requires maximum emission reduction achievable, taking into account environmental and economic impacts.

Miscellaneous Combustion Units

- **Applicability**
  - **Includes:** Dryers, dehydrators, ovens, kilns, calciners, furnaces, roasters, crematories, and incinerators.
  - **Excludes:** Boilers, water heaters, steam generators, and process heaters. (subject to District prohibitory Rules 342, 361, 360)

Example: Kiln

Example: Fabric Dryer
## Control Technologies

<table>
<thead>
<tr>
<th>Technology</th>
<th>Description</th>
<th>NOx Control</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Low NOx Burners</strong></td>
<td>Pre-mix the fuel and air, resulting in a more uniform and lower flame temperature.</td>
<td>30 - 75%</td>
</tr>
<tr>
<td><strong>Flue Gas Recirculation (FGR)</strong></td>
<td>Recycles a portion of the exhaust stream into the burner, reducing the flame temperature.</td>
<td>10 - 15%</td>
</tr>
<tr>
<td><strong>Selective Catalytic Reduction (SCR):</strong></td>
<td>Ammonia injection to reduce NOx in the exhaust.</td>
<td>80 - 95+%</td>
</tr>
</tbody>
</table>

**Example:** Low NOx Burner
BARCT Emission Standard

Based on rules from:
- South Coast AQMD (2008)
- Ventura County APCD (2016)
- San Joaquin Valley APCD (2005)
- Sac-Metro AQMD (2018)

BARCT assessment focused on units rated at 5 MMBtu/hr and greater.

<table>
<thead>
<tr>
<th>Equipment Category</th>
<th>Process Temperature</th>
<th>NOx Limit (ppmv)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dryer, Furnace, Kiln, or Heater</td>
<td>&lt; 1,200°F</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>≥ 1,200°F</td>
<td>60</td>
</tr>
</tbody>
</table>
Industry Impacts

Table 5.1 – Miscellaneous Combustion Units at Imerys

<table>
<thead>
<tr>
<th>#</th>
<th>Device Name</th>
<th>Rated Heat Input (MMBtu/hr)</th>
<th>Most Recent Modification</th>
<th>Permitted Emission Rate</th>
<th>BARCT Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>System 7 Kiln</td>
<td>50</td>
<td>1994</td>
<td>5.5 lbs/hr (≈ 48 ppmv NOx)</td>
<td>Exempt*</td>
</tr>
<tr>
<td>2</td>
<td>System 7 Furnace</td>
<td>45</td>
<td>2007</td>
<td>Uncontrolled (≈ 82 ppmv NOx)</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Silicates Conveyor Dryer</td>
<td>45 total [3 burners]</td>
<td>Pre-1990</td>
<td>Uncontrolled (≈ 82 ppmv NOx)</td>
<td>30 ppmv NOx</td>
</tr>
<tr>
<td>4</td>
<td>Silicates Flash Dryer</td>
<td>17.5</td>
<td>Pre-1990</td>
<td>Uncontrolled (≈ 82 ppmv NOx)</td>
<td>30 ppmv NOx</td>
</tr>
</tbody>
</table>

* System 7 Kiln and Furnace evaluated for BACT in 2007.
Units that recently achieved BACT are exempt from AB 617 - BARCT.
## Cost-Effectiveness

<table>
<thead>
<tr>
<th></th>
<th>Conveyor Dryer (3 burners)</th>
<th>Flash Dryer (1 burner)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Capital and Installation Costs:</strong></td>
<td>$480,000</td>
<td>$160,000</td>
</tr>
<tr>
<td><strong>Representative Operating Capacity:</strong></td>
<td>170,000 therms (4% capacity)</td>
<td>13,000 therms (1% capacity)</td>
</tr>
<tr>
<td><strong>Emission Reductions:</strong></td>
<td>0.53 tpy NOx</td>
<td>0.04 tpy NOx</td>
</tr>
<tr>
<td><strong>Cost-Effectiveness:</strong></td>
<td>$71,000 per ton of NOx</td>
<td>$303,000 per ton of NOx</td>
</tr>
</tbody>
</table>

Cost-Effectiveness is higher than the normally accepted values.
Cost-Effectiveness (Low-use)

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<tr>
<td>Capital and Installation Costs:</td>
<td>$480,000</td>
<td>$160,000</td>
</tr>
<tr>
<td>Low-use Threshold:</td>
<td>270,000 therms (7% capacity)</td>
<td>90,000 therms (6% capacity)</td>
</tr>
<tr>
<td>Emission Reductions @ Threshold:</td>
<td>0.84 tpy NOx</td>
<td>0.28 tpy NOx</td>
</tr>
<tr>
<td>Cost-Effectiveness @ Threshold:</td>
<td>$45,000 per ton of NOx</td>
<td>$45,000 per ton of NOx</td>
</tr>
</tbody>
</table>

- Project is more Cost-Effective at the Low-use Threshold.
BARCT Implementation

- Imerys submitted a permit application to incorporate the Low-Use Thresholds directly into their permit.
  - Results in enforceable permit conditions no later than 12/31/2023.

- If the Low-use Threshold is exceeded:
  - A new application will be required within 30 days.
  - Demonstrate compliance with the BARCT NOx standard within 18 months.
Staff Assessment

- Creating a new rule for Miscellaneous Combustion Units is no longer necessary.

- The BARCT Analysis will be presented to the District Board & forwarded to CARB.

- The BARCT Analysis will continue to apply to existing and new equipment units at the AB 617 Industrial Facilities.
BARCT Timeline for Misc. Units

- **December 2018:** BARCT Schedule adopted by District Board
- **January 2023:** Draft BARCT analysis sent to Imerys for review
- **August 2023:**
  1) “Low-use” Permit application submitted by Imerys
  2) CAC Meeting to receive update on BARCT Analysis
- **September 2023:** Permit Modification to be finalized
- **October 2023:**
  1) District Board Hearing to receive BARCT Analysis
  2) Forward Analysis to CARB
- **Dec. 31, 2023:** AB 617 Implementation Date
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