Agenda

- Welcome & Introductions
- BARCT Analysis
  - Refinery Sector
    - FCCUs
    - Gas Turbines and Duct Burners
    - Coke Calciner
    - Sulfur Recovery/Tail Gas Incinerators
    - Refinery Boilers/Heaters
  - Non-Refinery Sector
    - Cement Kilns
    - Container Glass Furnaces
    - Sodium Silicate Furnace
    - Metal Heat Treating Furnaces
    - ICEs
    - Gas Turbines
- RTC Reduction Exemption Mechanisms
- Preview: CEQA and Socioeconomic Scoping Meeting
- Next Steps
Overall BARCT Methodology

• Technical feasibility

• Cost effectiveness
  – Incremental cost effectiveness beyond 2000/2005 BARCT
  – Based on 2011 activity
Consultant’s Analysis

• Norton Engineering Consultant (NEC) selected for Refinery Sector

• Scope of NEC’s analysis
  1) Visited refineries in October to evaluate units with space constraint requested by refineries
     — 100 Boilers and Heaters at all 6 refineries
     — 2 FCCUs at Phillips66 and Valero
     — 2 Gas Turbines Duct Burners at Tesoro and Paramount
     — 3 SRU/TG Incinerators at Tesoro and Paramount
     — 20 SCRs at all 6 refineries
2) Provided recommendations to Staff on December 10
   — Recommended BARCT levels
   — Total installed costs and Present Worth Values (PWV) for Selective Catalytic Reductions (SCRs)
   — Size and space for SCR systems
   — Time for installation additional SCRs
   — Comments on Staff’s preliminary write-ups

• Staff estimated incremental cost effectiveness using NEC’s PWVs
NEC’s recommendations and results:

- BARCT feasible and cost-effective levels
  - 2 ppmv for FCCUs, Gas Turbines and Duct Burners, SRU/TG Incinerators, and Boilers and Heaters >40 mmbtu/hr
  - 5 ppmv – 10 ppmv for Coke Calciner
- Overall emission reductions 5.7 tpd (versus 6.2 tpd of Staff’s preliminary proposal) at 2011 reported emissions
- Cumulative PWV and average cost effectiveness within range of Staff’s preliminary estimates
REFINERY SECTOR

FCCUs
NEC’s Recommendations for FCCUs

• 2 ppmv NOx feasible with SCRs
• Sufficient space available
• NEC’s approach for PWV estimation
  – Selected Refinery 9’s FCCU as Base Case
  – Adjusted Manufacturer C’s costs to NEC’s design of 10 ft/sec velocity for a vertical SCR with 3 beds of catalysts

(Note: Manufacturer C recommended SCR with 3 beds, 2 beds filled with catalysts and 1 spare, designed at 12.8 ft per second velocity)
NEC’s Recommendations for FCCUs (Cont.)

- NEC’s approach for PWV estimation (Cont.)
  - New ammonia facility and skid for 29% aqueous ammonia
  - New CEMS for 2 ppmv
  - Prorated Refinery 9’s PWV to other FCCUs based on barrels per day capacity to the 0.6 power

- 2 - 3 years for implementation
### SCR’s PWVs for FCCUs

<table>
<thead>
<tr>
<th>Refinery</th>
<th>AQMD’s Estimates $ Million</th>
<th>NEC’s Estimates $ Million</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>&lt;33&lt;sup&gt;(2)&lt;/sup&gt;</td>
<td>&lt;46&lt;sup&gt;(2)&lt;/sup&gt;</td>
</tr>
<tr>
<td>6</td>
<td>&lt;57&lt;sup&gt;(2)&lt;/sup&gt;</td>
<td>&lt;46&lt;sup&gt;(2)&lt;/sup&gt;</td>
</tr>
<tr>
<td>7</td>
<td>27</td>
<td>42</td>
</tr>
<tr>
<td>4</td>
<td>16&lt;sup&gt;(3)&lt;/sup&gt;</td>
<td>38&lt;sup&gt;(3)&lt;/sup&gt;</td>
</tr>
<tr>
<td>9</td>
<td>19</td>
<td>39</td>
</tr>
<tr>
<td>Total</td>
<td>152</td>
<td>211</td>
</tr>
</tbody>
</table>

**Note:**
1) Presented at the January 22, 2014 WGM
2) Overestimated because of the inclusion of SCR costs that already have been installed
3) FCCU is expected to be dismantled in a near future
Incremental Cost Effectiveness for FCCUs

• 2005 BARCT: $139 M for 0.48 tpd NOx reduced (1)
• 2014 BARCT: $152 - $211 M for 0.91 tpd NOx reduced

Range of incremental cost effectiveness (DCF)

– Staff: $(152 - 139) M / (0.91 – 0.48) tpd /25/365
  = $3,444 per ton NOx reduced (1, 2)
– NEC: $(211 - 139) M / (0.91 – 0.48) tpd /25/365
  = $18,350 per ton NOx reduced (3)

Note: 1) Staff’s estimates presented at the January 22, 2014 WGM
2) LCF = $5.7K per ton
3) LCF = $30 K per ton
REFINERY SECTOR
Gas Turbines & Duct Burners
NEC’s Recommendations for Gas Turbines and Duct Burners

• 2 ppmv NOx at 15% O$_2$ feasible with SCRs
• Space available for catalyst addition
• NEC’s approach for PWV estimation
  – Increased catalyst costs provided by manufacturer by 10% and added labor costs
  – Increased costs for ammonia usage by 10%
  – Sufficient CEMS for 2 ppmv
• 1 - 1.5 years for implementation
# SCR’s PWVs for Gas Turbines

<table>
<thead>
<tr>
<th>No of Units</th>
<th>Rating MW</th>
<th>Current NOx Levels (ppmv)</th>
<th>AQMD’s Estimates $ Million</th>
<th>NEC’s Estimates $ Million</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>59</td>
<td>5.7</td>
<td>15.7 (new SCR)</td>
<td>5.1 (add catalysts)</td>
</tr>
<tr>
<td>3</td>
<td>46</td>
<td>3 – 4</td>
<td>12.6 (new SCR)</td>
<td>4.0 (add catalysts)</td>
</tr>
<tr>
<td>2</td>
<td>30</td>
<td>6</td>
<td>8.9 (new SCR)</td>
<td>2.6 (add catalysts)</td>
</tr>
<tr>
<td>1</td>
<td>23</td>
<td>5.7</td>
<td>7.2 (new SCR)</td>
<td>2.0 (add catalysts)</td>
</tr>
<tr>
<td>4</td>
<td>83</td>
<td>2.5 – 3.5</td>
<td>4.8 (add catalysts)</td>
<td>7.1 (add catalysts)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>97.7</strong></td>
<td></td>
<td><strong>52.7</strong></td>
</tr>
</tbody>
</table>

Note:  
1) Current NOx levels with DLE/DLN, Cheng Low NOx and existing SCR  
2) Presented in March 18, 2014 WGM
Incremental Cost Effectiveness
Gas Turbines and Duct Burners

• Incremental emission reductions = 4.14 tpd (1)

• Range of incremental cost effectiveness (DCF)
  – Staff: $97.7 M/4.14/25/365 = $2,586 per ton NOx (2)
  – NEC: $52.7 M/4.14/25/365 = $1,395 per ton NOx (3)

Note: 1) Presented at March 18, 2014 WGM
2) LCF = $4.3K/ton
3) LCF = $2.3K/ton
REFINERY SECTOR

Coke Calciner
NEC’s Recommendations for Coke Calciner

- 5 ppmv – 10 ppmv feasible with LoTOx
- NEC’s approach for PWV estimation
  - Additional retrofit and process development cost
  - Larger scrubber for additional residence time
  - Larger ozone supply and higher ozone usage with multiple stage injection
  - Higher utility costs
- Space available - no site visit requested
- 2-3 years for implementation
**Incremental Cost Effectiveness for Coke Calciner**

- Estimated PWV = $39.5 Million \(^{(1)}\)
- Incremental emission reductions = 0.17 – 0.21 tpd \(^{(2)}\)
- Incremental cost effectiveness (DCF)
  
  $39.5\ \text{M}/0.21/25/365 = \$20,613\ \text{per ton NOx} \quad \text{\textsuperscript{(3, 4)}}$
  
  $39.5\ \text{M}/0.17/25/365 = \$25,463\ \text{per ton NOx} \quad \text{\textsuperscript{(3, 4)}}$

**Note:**

1) In comparison to $22.1 million estimated by Staff presented in the July 31, 2014 WGM

2) Incremental emission reductions from 2005 BARCT level of 30 ppmv to 2014 NEC’s proposed BARCT level of 5-10 ppmv would be 0.17 tpd if BARCT is set at 10 ppmv and 0.21 tpd if BARCT is set at 5 ppmv

3) LCF = $34\ \text{K} - $42\ \text{K per ton}$

4) Staff estimated presented in the July 31, 2014 WGM for incremental cost effectiveness = $10\ \text{K} - $11\ \text{K per ton (DCF)}$ and $17\ \text{K} - $18\ \text{K per ton (LCF)}$
REFINERY SECTOR

SRU/TG Incinerators
NEC’s Recommendations for SRU/TGs

• 2 ppmv NOx feasible with SCRs
• Space available
• NEC’s approach for PWV estimation
  – Costs for SCRs prorated from FCCU’s SCR costs
  – Added Waste Heat Boiler $4 million and prorated to other units
  – Added new ammonia facility for 29% aqueous ammonia and new CEMS
• 2-3 years implementation
## Comparison of NEC’s and Staff’s Estimates

**SRU/TG Incinerators**

<table>
<thead>
<tr>
<th></th>
<th>AQMD’s Estimates (1)</th>
<th>NEC’s Estimates</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Control Technology</strong></td>
<td>SCR, LoTOx, KnowNOx</td>
<td>SCR</td>
</tr>
<tr>
<td><strong>PWVs</strong></td>
<td>$8 M - $11 M</td>
<td>$10 M - $26 M</td>
</tr>
<tr>
<td><strong>Cost Effective Units</strong></td>
<td>10</td>
<td>9 (2)</td>
</tr>
<tr>
<td><strong>Emission Reductions</strong></td>
<td>0.35 tpd</td>
<td>0.32 tpd (2)</td>
</tr>
<tr>
<td><strong>Cost Effectiveness (DCF)</strong></td>
<td>$15 K - $21 K per ton</td>
<td>$16 K - $48 K per ton (2)</td>
</tr>
<tr>
<td><strong>Cost Effectiveness (LCF)</strong></td>
<td>$25 K - $36 K per ton</td>
<td>$26 K - $79 K per ton (2)</td>
</tr>
</tbody>
</table>

Note: 1) Refer to July 31, 2014 WGM, 2) Staff’s estimates based on NEC’s PWV information
REFINERY SECTOR

NEC’s Analysis for Boilers/Heaters
NEC’s Recommendations for Boilers/Heaters

- 2 ppmv NOx feasible with SCRs
- Space available

**NEC’s approach for PWV estimation**
- SCR costs prorated from FCCU’s SCR costs
- SCR with 3 layers of SCR catalysts
- Added 1 layer of Ammonia Slip Catalyst to handle Refinery Fuel Gas Variation
- Added Waste Heat Boiler, new ammonia facility, and CEMS
- Adjustment factors for site specific situations

- 2 - 3 years implementation
Comparison for NEC’s and Staff’s Estimates for Boilers/Heaters

Upperbound PWVs per SCAQMD’s Estimates
5 million dollars for \( \leq 100 \) mmbtu/hr boilers/heaters
10 million dollars for \( > 100 - 200 \) mmbtu/hr boilers/heaters
20 million dollars for \( > 200 - 400 \) mmbtu/hr boilers/heaters
30 million dollars for \( > 400 - 600 \) mmbtu/hr boilers/heaters
45 million for \( > 600 \) mmbtu/hr boilers/heaters
Comparison of NEC’s and Staff’s Estimates for Boilers/Heaters

<table>
<thead>
<tr>
<th>Control Technology</th>
<th>AQMD’s Estimates (1)</th>
<th>NEC’s Estimates</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SCR, Great Southern</td>
<td>SCR</td>
</tr>
<tr>
<td></td>
<td>Flameless, ClearSign, LoTOx</td>
<td>48 (2)</td>
</tr>
<tr>
<td>Cost Effective Units</td>
<td>103</td>
<td></td>
</tr>
<tr>
<td>Total PWVs</td>
<td>$254.5 Million</td>
<td>$162 Million (2)</td>
</tr>
<tr>
<td>Emission Reductions</td>
<td>1.05 tpd</td>
<td>0.61 tpd (2)</td>
</tr>
<tr>
<td>Average Cost</td>
<td>$26,520 per ton</td>
<td>$29,377 per ton (2)</td>
</tr>
<tr>
<td>Effectiveness (DCF)</td>
<td>$44,288 per ton</td>
<td>$49,059 per ton (2)</td>
</tr>
<tr>
<td>Average Cost</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Effectiveness (LCF)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: 1) Refer to July 31, 2014 WGM, 2) Staff’s estimates based on NEC’s PWV information
REFINERY SECTOR

Summary
## BARCT Control Options for Refinery Sector

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Reductions (tpd)</td>
<td>PWVs ($ M)</td>
<td>Reductions (tpd)</td>
</tr>
<tr>
<td>Gas Turbines</td>
<td>2 ppmv</td>
<td>4.14</td>
<td>97.7</td>
<td>4.14</td>
</tr>
<tr>
<td>FCCUs</td>
<td>2 ppmv</td>
<td>0.43</td>
<td>152</td>
<td>0.43</td>
</tr>
<tr>
<td>Coke Calciner</td>
<td>5 ppmv</td>
<td>0.21 (1)</td>
<td>22 – 61</td>
<td>0.17 (2)</td>
</tr>
<tr>
<td>Boilers/Heaters &gt; 40 mmbtu/hr</td>
<td>2 ppmv</td>
<td>1.05</td>
<td>254.5</td>
<td>0.61</td>
</tr>
<tr>
<td>SRU/TG Incinerators</td>
<td>2 ppmv</td>
<td>0.35</td>
<td>49 – 68</td>
<td>0.32</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>6.2</strong></td>
<td><strong>575 – 633</strong></td>
<td></td>
<td><strong>5.7</strong></td>
</tr>
</tbody>
</table>

Range: 5.7 tpd – 6.2 tpd NOx Reductions at $575 Million – $633 Million

Note: 1) Reflect 5 ppmv BARCT 2) Reflect 10 ppmv BARCT 3) Weighted average by NOx reductions
Energy Efficiency Assessment for Refinery Sector

- Information submitted by refineries to CARB for energy efficiency projects to reduce GHG and provide concurrent co-benefits reduction of NOx and PM2.5
- Projects cover Boilers, Steam Generators, and other combustion processes
- Emission reductions estimated for three categories
  - Completed & on going (2007-2011): 0.6 tpd NOx reduction
  - Scheduled: 0.05 tpd NOx reduction
  - Under investigation: 0.07 tpd – 0.08 tpd NOx reduction
- Refer to [http://www.arb.ca.gov/cc/energyaudits/eeareports/refinery.pdf](http://www.arb.ca.gov/cc/energyaudits/eeareports/refinery.pdf)
BARCT Analysis Results for Refinery Sector

Average numbers are used in this graph to include all feasible control technologies and reconcile estimates from various sources of information.

BARCT in 5 Categories with Energy Efficiency Co-Benefits
6.7 tpd NOx Reductions - $604 Million - $9,879 per ton NOx Reduced

Bar chart representing various emission reduction scenarios and corresponding costs in millions of dollars:
- Gas Turbines, FCCUs: 5.2 tpd - $257 Million
- Gas Turbines: 4.7 tpd - $75 Million
- Gas Turbines, FCCUs, Coke Calciner, Boilers Heaters: 6.2 tpd - $510 Million
- Gas Turbines, FCCUs, Coke Calciner: 5.4 tpd - $302 Million
- FCCUs, Gas Turbines: 5.2 tpd - $257 Million
- SRU/TG Incinerators: 6.6 tpd - $604 Million
- Energy Efficiency Co-Benefits: 0.6 tpd - $0 Million
NON-REFINERY SECTOR

Consultant’s Analysis
Scope of Consultant’s Analysis

• Review SCAQMD staff’s BARCT feasibility and cost effectiveness analysis for the following equipment categories
  – Cement Kilns
  – Container Glass Melting Furnace
  – Sodium Silicate Furnace
  – Metal Heat Treating Furnace >150 MMBTU/hr
  – Gas Turbines (non-power-plant)
  – IC Engines (non-power plant, non-offshore)
  – Boilers >40 MMBTU/hr
Scope of Consultant’s Analysis

• Field visits and reassessment of feasibility and costs
  – Field visits conducted for the container glass and cement sector

• ETS, Inc. provided the following:
  – Emission reduction levels
  – Implementation date
  – Cost and performance warranty
  – Cost effectiveness analysis
Cement Kilns

• ETS concurs that the control technology to achieve the proposed BARCT levels is either SCR or the dry scrubbing ceramic filtration system

• The emission reductions are technically feasible with any of the three vendor control technologies evaluated

• Sufficient plot space available
Cement Kilns

- A project contingency of 15% was applied to the total direct and indirect capital costs

<table>
<thead>
<tr>
<th>Vendor</th>
<th>SC AQMD (ETS)</th>
<th>SC AQMD (ETS)</th>
<th>SC AQMD (ETS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PWV ($)</td>
<td>34,016,551 (36,259,151)</td>
<td>45,622,000 (50,122,000)</td>
<td>107,214,017 (112,004,843)</td>
</tr>
<tr>
<td>Cost Effectiveness DCF ($/ton)</td>
<td>2,897 (3,088)</td>
<td>3,885 (4,268)</td>
<td>9,130 (9,538)</td>
</tr>
</tbody>
</table>

Vendor 1: SCR
Vendor 2: Ceramic Filtration System with Dry Scrubbing
Vendor 3: SCR with Wet Scrubbing and Heat Exchanger
Container Glass Melting Furnace

- While plot space considerations are more complex, ETS concurs that there is sufficient plot space for an SCR system.
- While recognized that the ceramic filter system would replace the existing control equipment, specific details of how that would occur were not discussed.
- Additional cost considerations may be required for either a remote location or the removal of the existing control equipment prior to installation of the ceramic filter system.
Vendor 3 facility-derived costs were not evaluated because they were not based on actual equipment supplier estimates.

ETS concurs that the NOx emission reduction level that can be achieved is 80%, with either SCR or the ceramic filtration system.
A 15% contingency was added to the Vendor 1 and 2 capital costs, along with other capital and operating cost adjustments.

<table>
<thead>
<tr>
<th>PWV ($)</th>
<th>Vendor 1 SCAQMD (ETS)</th>
<th>Vendor 2 (1 SCR) SCAQMD (ETS)</th>
<th>Vendor 2 (3 SCR) SCAQMD (ETS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>14,003,287 $(14,522,859)</td>
<td>4,139,195 $(6,448,737)</td>
<td>7,823,677 $(11,040,686)</td>
<td></td>
</tr>
<tr>
<td>Cost Effectiveness DCF $(/ton)</td>
<td>6,442 $(6,695)</td>
<td>1,904 $(2,967)</td>
<td>3,599 $(5,079)</td>
</tr>
</tbody>
</table>
Sodium Silicate Furnace

• ETS concurs that the NOx emission level that can be achieved is 80%
• Both SCR and ceramic filtration technologies are considered technically feasible
• A contingency of 15% was applied to both vendor capital cost estimates

<table>
<thead>
<tr>
<th></th>
<th>Vendor 1 SCAQMD (ETS)</th>
<th>Vendor 2 SCAQMD (ETS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PWV ($)</td>
<td>2,792,193 (3,032,193)</td>
<td>4,579,663 (4,602,745)</td>
</tr>
<tr>
<td>Cost Effectiveness DCF ($/ton)</td>
<td>3,470 (3,768)</td>
<td>5,691 (5,719)</td>
</tr>
</tbody>
</table>

Vendor 1: SCR
Vendor 2: Ceramic Filtration System
Metal Heat Treating Furnace

>150 MMBTU/hr

- ETS concurs that the NOx emission reduction level that can be achieved is 80% with SCR technology.

- The costing is generally useful and no revisions were made.
IC Engines
(Non-Power Plant, Non-Offshore)

• ETS concurs that the NOx emission level can be achieved for this source category with SCR technology at 11 ppm @15%O₂

• No revisions were made to the costing
Non-Refinery, Non-Power Plant
Stationary Gas Turbines

• ETS concurs that a 2 ppm level (@15% O₂ ) would be achievable for units emitting >40 ppm if these units would install either wet or dry combustion controls in addition to SCR
• NOx emission reductions of 90% to 95% are technically feasible with SCR alone
• No revisions were made to the costing
Non-Refinery Boilers

>40 MMBTU/hr

• ETS concurs that meeting the emission level evaluated is not cost effective for this source category (>70K per ton)
Implementation Dates

• The typical installation time for an SCR system is approximately 24 months after selection of an engineering firm to develop the specifications and commence the design engineering.

• Depending on the engineering firm selection time, the total implementation time is estimated to be 27-30 months.
Implementation Dates (Cont.)

• For smaller systems, the implementation dates would potentially be shorter
• The implementation dates are projected to be from 2017 to 2018
# BARCT Summary for Non-Refinery Sector

<table>
<thead>
<tr>
<th>Source Category</th>
<th>Proposed 2014 BARCT</th>
<th>Emission Reductions (TPD)</th>
<th>SCAQMD PWV ($MM)</th>
<th>ETS PWV ($MM)</th>
<th>Incremental DCF CE ($/ton)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cement Kilns</td>
<td>0.5 lb/ton clinker</td>
<td>1.32</td>
<td>34 – 107</td>
<td>36 – 112</td>
<td>3 – 10K</td>
</tr>
<tr>
<td>Container Glass</td>
<td>0.24 lb/ton pulled</td>
<td>0.24</td>
<td>4 – 14</td>
<td>6 – 15</td>
<td>3 – 7K</td>
</tr>
<tr>
<td>Sodium Silicate Furnace</td>
<td>1.28 lb/ton pulled</td>
<td>0.09</td>
<td>2.8 – 4.6</td>
<td>3 – 4.6</td>
<td>4 – 6K</td>
</tr>
<tr>
<td>Metal Heat Treating Furnaces &gt;150 MMBTU/hr</td>
<td>9 ppm @3%O₂</td>
<td>0.56</td>
<td>8 – 10</td>
<td>8 – 10</td>
<td>3 – 3.8K</td>
</tr>
<tr>
<td>Gas Turbines</td>
<td>2 ppm @15%O₂ or 95% reduction</td>
<td>1.04</td>
<td>3 – 14</td>
<td>3 – 14</td>
<td>5 – 36K</td>
</tr>
<tr>
<td>ICEs</td>
<td>11 ppm @15%O₂</td>
<td>0.84</td>
<td>0.9 – 4</td>
<td>0.9 – 4</td>
<td>5 – 8K</td>
</tr>
<tr>
<td>Boilers &gt;40 MMBTU/hr</td>
<td>No new BARCT</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td><strong>4.09</strong></td>
<td><strong>53 – 154</strong></td>
<td><strong>57 – 160</strong></td>
<td><strong>4 – 15K</strong>**</td>
</tr>
</tbody>
</table>

* LCF ranges from $5,000 to $57,000 per ton  ** Weighted average by NOx reductions
RTC REDUCTION
EXEMPTION MECHANISMS
RTC Reduction Exemption

• Rule 2002(i)
• January 7, 2005 Amendment
• Limited exemption
• Two options
• Must meet certain criteria
Exemption Options

1. Practically no equipment with proposed BARCT and required Cost Assessment
2. All equipment at BARCT (existing and proposed)
RTC Reduction Exemption

Option #1 Criteria

• Existing facility (since 1994)
• At least 99 percent of the facility’s emissions are:
  – not from equipment with the proposed NOx RECLAIM NOx ending emission factors; and
  – less than or equal to the lowest existing or proposed NOx RECLAIM emission factor for the applicable equipment
RTC Reduction Exemption

Option #1 Criteria (Cont.)

• RTCs from the facility’s initial allocation have never been sold or transferred for 2016 or later compliance years; and

• The cumulative compliance costs to meet the shave exceeds the costs that otherwise would have occurred under a command-and-control.

• Exempt credits not tradable
RTC Reduction Exemption

Option #1 Compliance Cost Parameters

• Capital and total annual costs, excluding costs related to the proposed emission factors
• Revenues and expenditures resulting from the buying and selling of RTCs
• Cost savings resulting from any NOx emission strategy, such as:
  – Fuel savings; and
  – Increased production or sale
RTC Reduction Exemption

Option #1 Compliance Cost Parameters (Cont.)

• Costs **not** to be included:
  – Complying with NSR or other state or federal requirements limiting NOx emissions;
  – Resulting only in process efficiency or product quality; and
  – Legal costs not directly related NOx emission reductions
RTC Reduction Exemption

Option #1 Exemption Request Submittal

• A detailed description of each RECLAIM NOx reduction project;
• Detailed calculations of the emission reductions;
• Itemized revenue and expenditures for each RTC trading activity;
• Itemized costs for each project; and
• Cost savings resulting from each projects
RTC Reduction Exemption

Option #2 Criteria

Information demonstrating that:

• The starting and year 2000 Allocations were calculated using the same emission factors;

• All equipment meets the lower applicable existing or proposed BARCT emission limits; and

• RTCs for 2016 or later compliance years has not been sold or transferred
RTC Reduction Exemption

Option #2 Exemption Request Submittal

• Current demonstrated rate for each piece of equipment; and
• Any other pertinent data demonstrating exemption status
CEQA & Socioeconomic Scoping Meeting: Tomorrow, January 8, 2015 at 10:00 AM in the Auditorium

- Identify affected industries/facilities
- Describe approaches
- Solicit stakeholder input
- Identify key issues
Next Steps

• CEQA & Socioeconomic Scoping Meeting – January 8, 2015

• Continued Working Group meetings

• Stationary Source Committee Meeting (1\textsuperscript{st} and 2\textsuperscript{nd} Quarters)

• Public Workshop - 1\textsuperscript{st} quarter 2015

• Rule adoption: 2\textsuperscript{nd} quarter 2015
Contact

Gary Quinn, P.E.
gquinn@aqmd.gov
(909) 396 - 3121

**Refineries**
Minh Pham, P.E.
mpham@aqmd.gov
(909) 396 - 2613

**Non-Refineries**
Kevin Orellana
korellana@aqmd.gov
(909) 396 - 3492