



Proposed Rule (PR) 1147.2

NOx Reductions from Metal Melting and Heating Furnaces

Working Group Meeting #7

February 2, 2021

Zoom URL: <https://scaqmd.zoom.us/j/96004625785>

Dial-In: 1 (669) 900-6833

Meeting ID: 960 0462 5785

Agenda

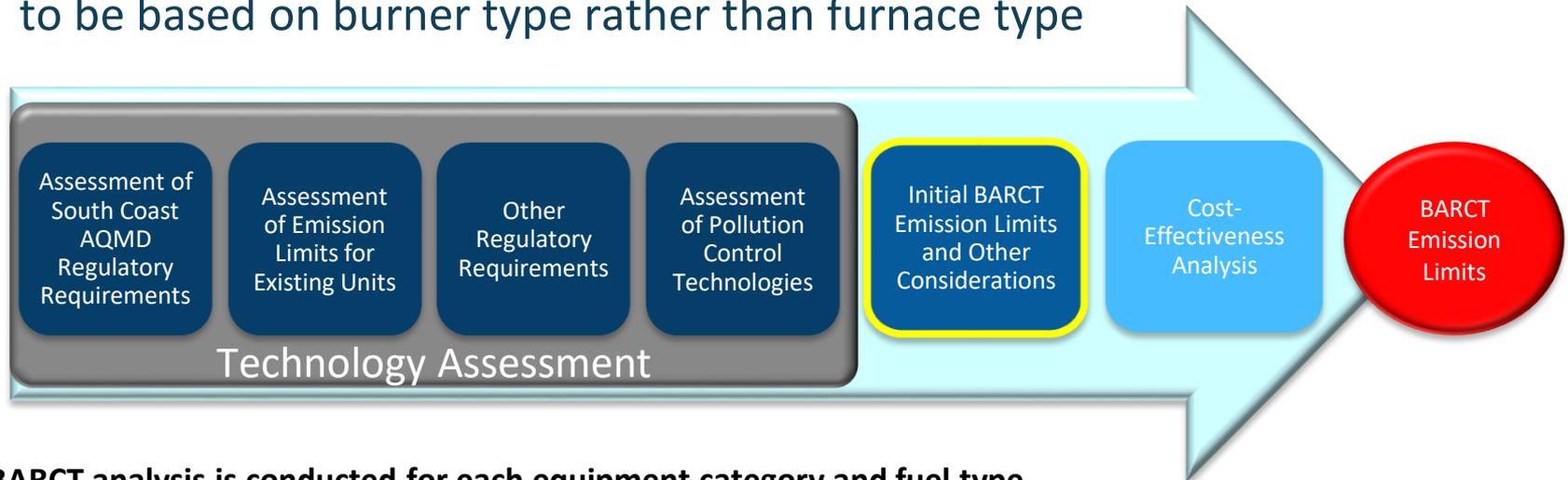
-
- Summary of Previous Working Group Meeting
 - Stakeholder Comments
 - Proposed Implementation Approach
 - Cost-Effectiveness Analysis Approach
 - Metal Melting Recalculation Costs
 - Metal Heating Assessment
 - Next Steps



Summary of Previous Working Group Meeting

Summary of Previous Working Group Meeting

- Meeting focused on BARCT analysis for metal melting units
- Re-assess technological feasibility of burners for metal melting units
- Revised initial BARCT emission limits and recategorized metal melting units to be based on burner type rather than furnace type

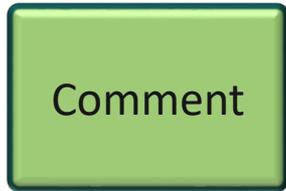


***BARCT analysis is conducted for each equipment category and fuel type**



Stakeholder Comments

Stakeholder Comments



- Initial BARCT emission limits should consider temperature
- Vendor emission guarantees should include temperature and turndown ratios



- Metal melting did not exhibit a significant correlation between source test results and operating temperature when sub-categorized by burner type
- Metal heating has been sub-categorized by temperature
- Vendor emission guarantees are presented
 - All guarantees include a temperature condition and most contain an excess air condition

Stakeholder Comments

Comment

- Obtain costs for regenerative burner installation, as they could be much greater than cold-air burners and Rule 1146 is simply a burner swap

Response

- Staff applied the 3x multiple of cold-air burners that was used for equipment costs onto installation costs
- Proposed Rule 1147.2 will evaluate requirements for cold-air burners and regenerative burners
- Proposed Rule 1147.2 will not require transition from regenerative burners to cold-air burners (or vice-versa)



Proposed Implementation Approach

Implementation Approach

- Staff is proposing an implementation approach for RECLAIM and non-RECLAIM facilities, that is generally modeled after Rule 1147
- Two implementation schedules
 - All units, except low-emitting or near-limit units, must submit permit applications to meet the proposed NOx limit when the burner reaches 12 years
 - Low-emitting or near-limit units must submit permit applications to meet the proposed NOx limit when the burner reaches 32 years
- Regardless of the implementation schedule, the proposed NOx limit must be met if there is a combustion system modification, combustion system or burner replacement, unit relocation, or unit replacement
- Units that meet the proposed BARCT limit through a source test will not be required to replace their burner; however, operators may need to modify their permit to reflect the proposed BARCT limit

Proposed Compliance for Units Subject to 12 Year Provisions

- Currently Rule 1147 requires that operators meet NOx emission limits when the “unit” reaches 15 years
- When the *burner* reaches 12 years, the operator must:
 - First: Submit a permit application to meet the proposed NOx limit (6 months to submit permit application)
 - Second: Meet proposed NOx limit 12 months after the permit to construct is issued
- Assuming an 18-month permit approval process, operators must meet the proposed NOx limit when the burner is about 15 years old – similar to the 15 years allowed under Rule 1147
- Basing this provision on burner age instead of unit age ensures that all units meet the proposed NOx limits
- The “two-step” implementation ensures that the operator has the full 12 months to meet the proposed NOx limit

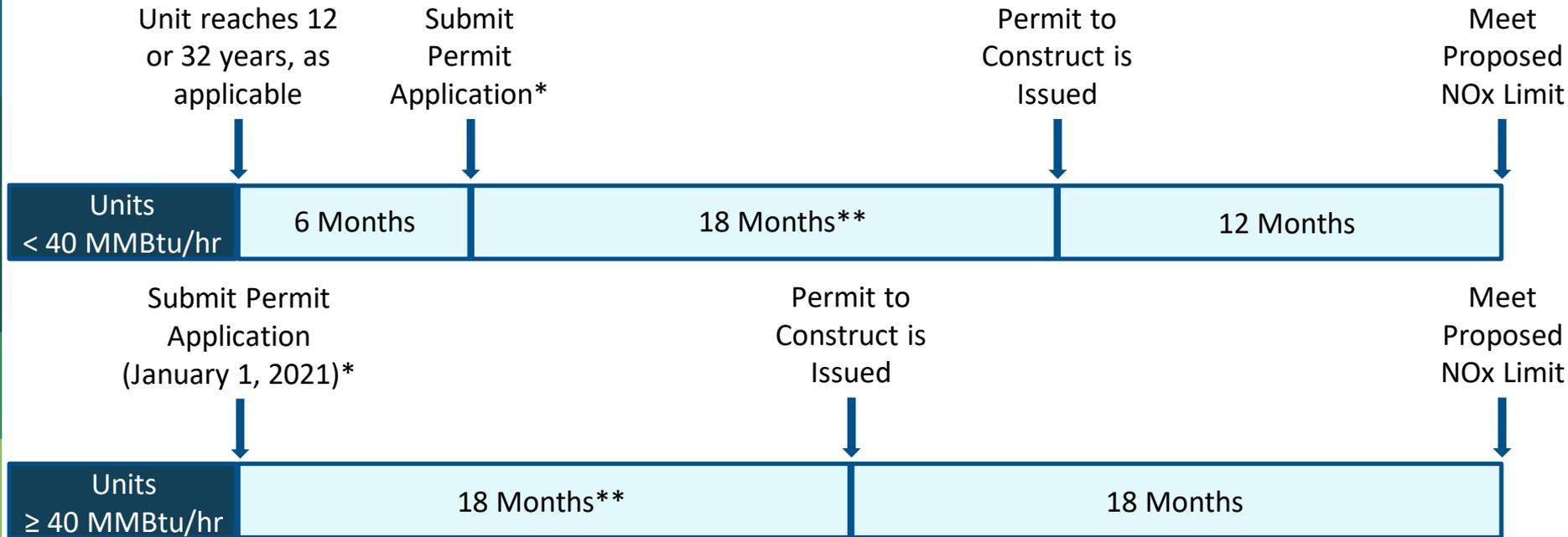
Proposed Compliance for Units Subject to 32 Year Provisions

- Currently Rule 1147 requires that operators with units < 1 lb/day meet NOx emission limits when the “unit” reaches 35 years
- PR 1147.2 expands this concept for low-emitting units to also include units that are near the proposed NOx limit referred to as “near-limit units”
- For low-emitting and near-limit units, when the *burner* reaches 32 years the operator must:
 - First: Submit a permit application to meet the proposed NOx limit (6 months to submit permit application)
 - Second: Meet proposed NOx limit 12 months after the permit to construct is issued
- Assuming an 18-month permit approval process, operators must meet the proposed NOx limit when the burner is about 35 years old – similar to the 35 years allowed under Rule 1147
- The “two-step” implementation ensures that the operator has the full 18 months to meet the proposed NOx limit

Defining Low-Emitting and Near-Limit Units Subject to 32 Year Provision

- PR 1147.2 will use the same threshold as Rule 1147 for defining low-emitting units at < 1 lb/day
- PR 1147.2 proposes that near-limit units have a permit limit that is within 10 ppm from the proposed NOx limit AND < 65 MMScf natural gas usage per year
 - Units that meet this criteria had an average cost-effectiveness of \$121,000 per ton of NOx reduced
 - This approach will address units with high cost-effectiveness values, but still requires that operators to meet the proposed NOx limit when the burner reaches 35 years

Implementation Timelines



* Failure to submit permit application by appropriate deadline will require that unit to meet BARCT limit when the burner turns 15 or 35 years, as applicable for units < 40 MMBtu/hr, or by January 1, 2024 for units ≥ 40 MMBtu/hr

** Permitting timeline subject to vary

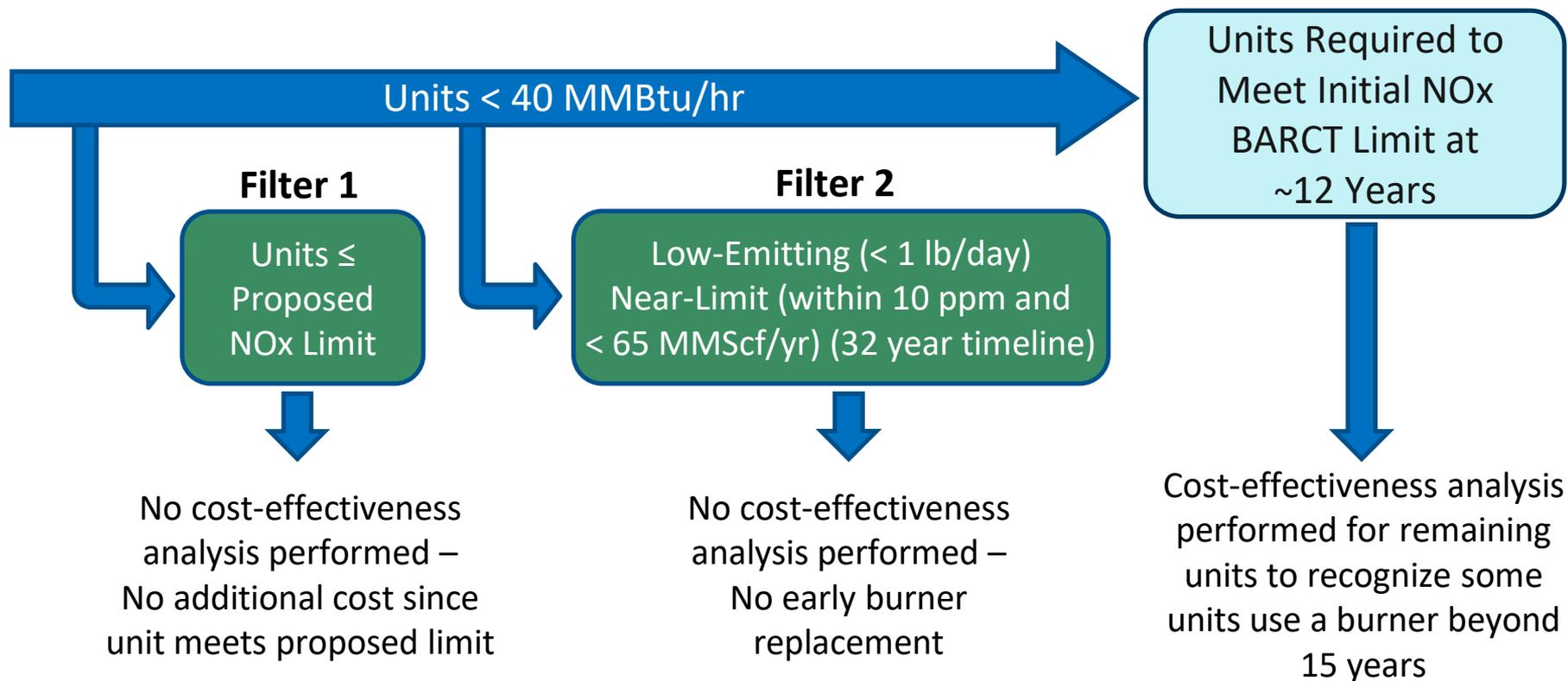
Implementation Approach for Non-RECLAIM and RECLAIM

Applicability	Implementation
<p>All Units (Except Low-Emitting and Near Limit Units)</p>	<ul style="list-style-type: none"> Beginning July 1, 2021 and every July thereafter, when a burner reaches 12 years submit a permit application by January 1st of the following calendar year that the burner reaches 12 years Must meet proposed NOx limit 12 months after Permit to Construct is issued
<p><u>Low-Emitting Units</u> All units with baseline emissions < 1 lb/day NOx</p> <p><u>Near-Limit Units</u> All units with a permit limit within 10 ppm of proposed NOx limit and < 65 MMScf/yr gas usage</p>	<ul style="list-style-type: none"> Beginning July 1, 2021 and every July thereafter, when a burner reaches 32 years submit a permit application by January 1st of the following calendar year that the burner reaches 32 years Must meet proposed NOx limit 12 months after Permit to Construct is issued
<p>All Units</p>	<ul style="list-style-type: none"> Regardless of the implementation schedule above, operators must meet proposed NOx limit if there is a combustion system modification, combustion system or burner replacement, unit relocation, or unit replacement



Cost-Effectiveness Analysis Approach

Cost-Effectiveness Based Implementation Approach for Units < 40 MMBtu/hr



Approach for Units \geq 40 MMBtu/hr

- For units \geq 40 MMBtu/hr, staff is evaluating a proposed NOx limit that assumes a combination of low-NOx burners and SCR
- Since the proposed NOx limit assumes units would need to go beyond replacement of burners, staff conducted the cost-effectiveness for all units \geq 40 MMBtu/hr that are above the proposed NOx limit
- Implementation schedule
 - Units submit applications by January 1, 2022
 - Units must meet proposed NOx limit 18 months after Permit to Construct is issued



Metal Melting Recalculation of Costs

Updated Retrofit Costs

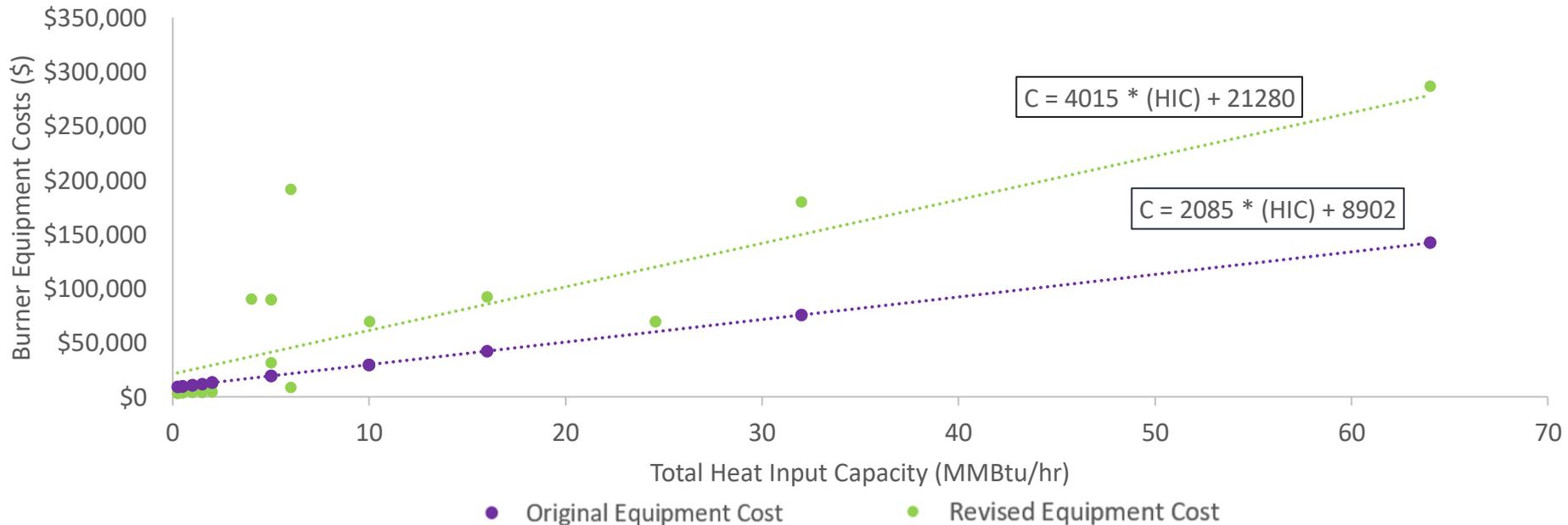
- Based on requests, several stakeholders have provided quotes, invoices, or statements regarding metal furnace retrofits
- Five facilities provided retrofit data for 8 burner retrofits
 - 5 provided equipment and labor cost
 - 3 provided total cost (no breakdown of equipment and labor costs)
 - Applied ratio of equipment and labor costs based on 5 burner retrofits that provided information
- Vendor Data
 - 2 vendors provided 15 burner quotes over a span of heat input capacities
- Installation Costs
 - Staff retained Rule 1146 formula for installation cost

$$\text{Installation Cost} = \$1,700 * (\text{Heat Input Capacity}) + \$25,800$$

Updated Retrofit Costs (continued)

■ Cost Formulas

- **Original:** $\$2,085 * (\text{Heat Input Capacity: HIC}) + \$8,902$
- **Revised:** $\$4,015 * (\text{Heat Input Capacity: HIC}) + \$21,280$



Cost-Effectiveness Analysis for Units ≥ 40 MMBtu/hr

- Consistent with Rule 1146, staff is recommending 40 MMBtu/hr as the size cutoff for a 15 ppm BARCT limit that assumes SCR installation and burner replacement as well as an 80% NOx reduction efficiency for SCR
 - Although the cost-effectiveness analysis assumes a combination of SCR and burner replacements to meet 15 ppm, some units may be able to achieve the proposed 15 ppm NOx limit with only SCR
- If units the cost-effectiveness is > \$50,000 per ton of NOx reduced when evaluating the 15 ppm NOx limit, staff will evaluate the cost-effectiveness to meet the NOx concentration limits representative of burner replacement only

Updated Cost-Effectiveness Approach

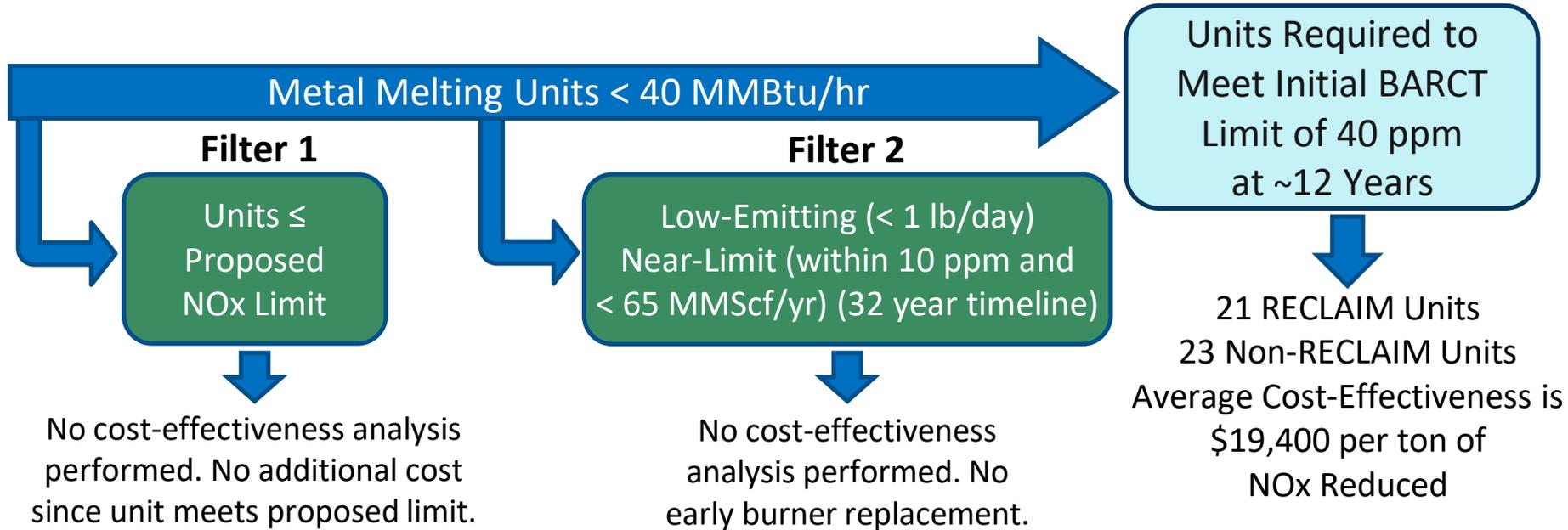
Metal Melting

- Cost-effectiveness was re-calculated for metal melting due to revised burner costs
- Initial units included in cost-effectiveness analysis comprised of RECLAIM units
- RECLAIM units carved out that met filter criteria

Cost-Effectiveness Analysis for Initial BARCT Limit of 40 PPM

Metal Melting

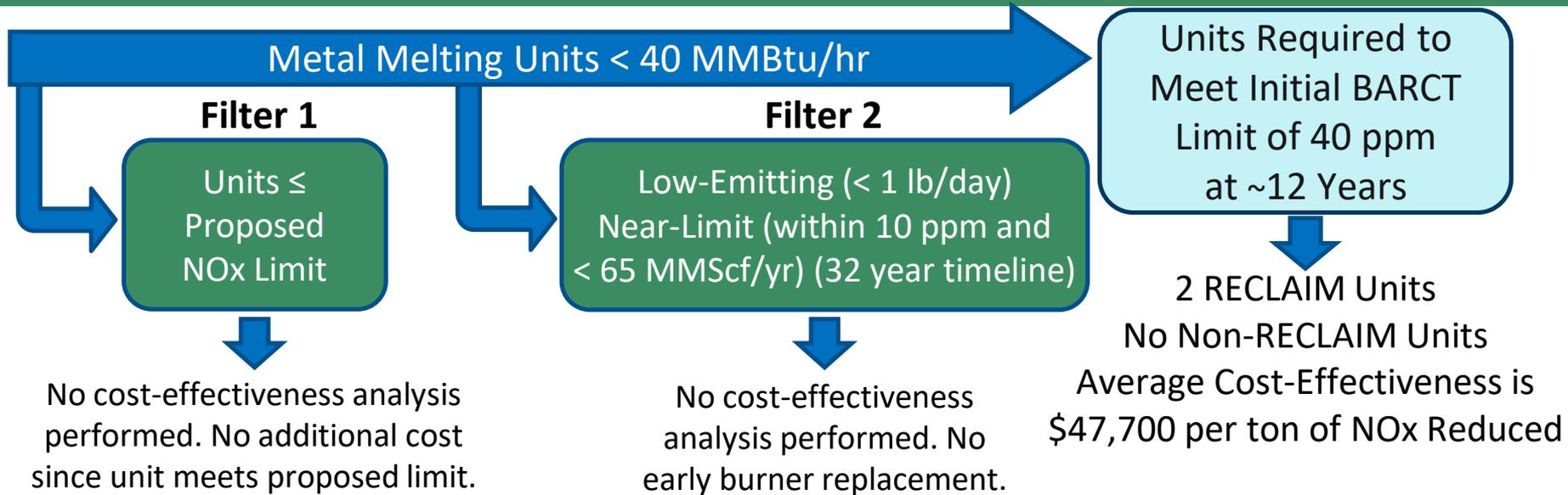
Cold-Air Burners
< 40 MMBtu/hr



**Proposed NOx BARCT limit for metal melting units
< 40 MMBtu/hr with cold-air burners is 40 ppm @ 3% O₂
Proposed maximum near-limit for this category is 50 ppm @ 3% O₂**

Cost-Effectiveness Analysis for Initial BARCT Limit of 40 PPM

Metal Melting
Regenerative Burners
< 40 MMBtu/hr



Proposed NOx BARCT limit for metal melting units < 40 MMBtu/hr with regenerative burners is 40 ppm @ 3% O2
Proposed maximum near-limit for this category is 50 ppm @ 3% O2

- The 2 RECLAIM units were analyzed to calculate the cost-effectiveness
- Both units have source tests ≤ 50 ppm and expected to use the near-limit provision

Cost-Effectiveness Analysis for Initial BARCT Limit of 15 PPM

Metal Melting
≥ 40 MMBtu/hr

- Submit application by January 1, 2022
- Unit must meet proposed NOx limit 18 months after Permit to Construct is issued
- 1 RECLAIM unit with cost-effectiveness of \$41,700 per ton of NOx reduced*
 - No non-RECLAIM units

**Proposed NOx BARCT limit for metal melting units
≥ 40 MMBtu/hr is 15 ppm @ 3% O₂**

* Burners are regenerative burners (3x equipment and installation costs of cold-air burners); and assumes 80% efficiency for SCR for this application

Summary of Proposed BARCT Limit Metal Melting

Metal Melting

Category	Applicability	Rule 1147 Limit (@ 3% O2)	Proposed BARCT Limit (@ 3% O2)	Near-Limit Designation*	Baseline Emissions (TPD)	Emission Reductions by 2024** (TPD)
Metal Melting	Cold-Air < 40 MMBtu/hr	60 ppm	40 ppm (via Burner)	> 40 to ≤ 50 ppm	0.15	0.068 0.072 (final)
	Regenerative < 40 MMBtu/hr	60 ppm	40 ppm (via Burner)	> 40 to ≤ 50 ppm	0.03	0 0.01 (final)
	Cold-Air ≥ 40 MMBtu/hr	60 ppm	15 ppm (via SCR)	None	0.013	0.012

* Corrected to 3% O2

** Emission reductions are difference between permit level and BARCT level emissions

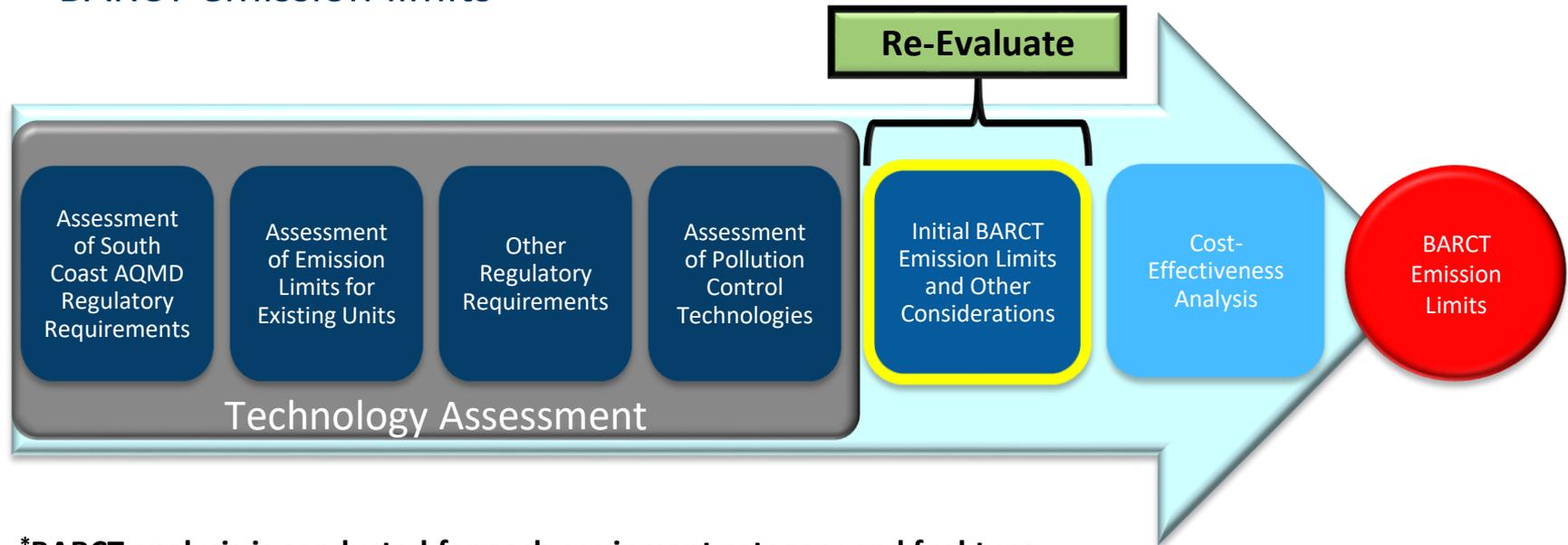
Total NOx emission reductions (RECLAIM and non-RECLAIM):
0.08 TPD by 2024 and 0.095 TPD at final implementation



Metal Heating Assessment

Re-Evaluation of Technology Assessment for Metal Heating

- Due to comments received regarding forging differences and temperature considerations, staff re-evaluated the technical assessment and initial BARCT emission limits

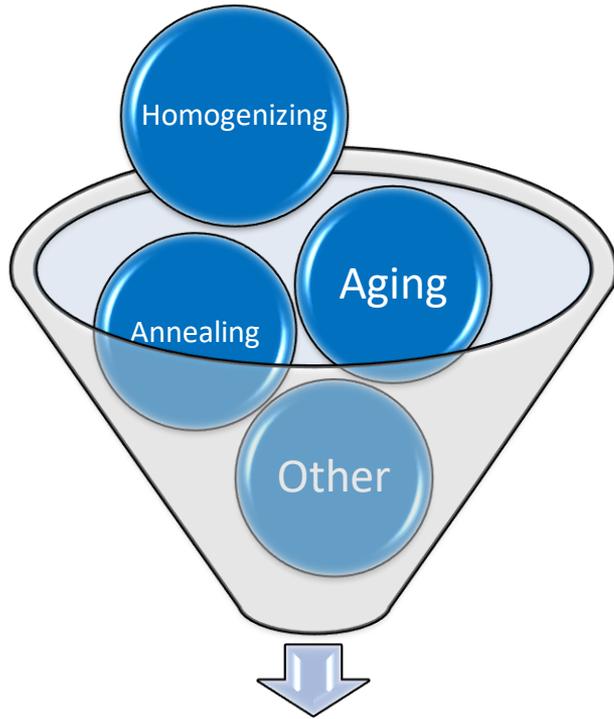


*BARCT analysis is conducted for each equipment category and fuel type

Reasons for Re-Evaluation of the Proposed NOx Emission Limit

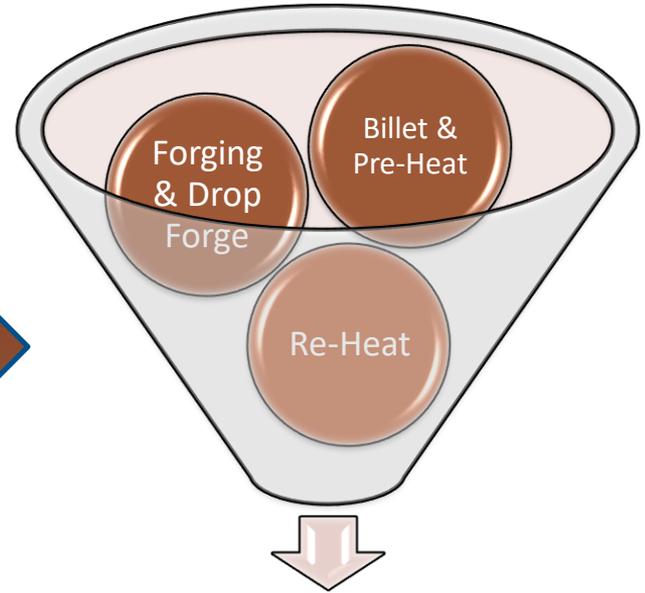
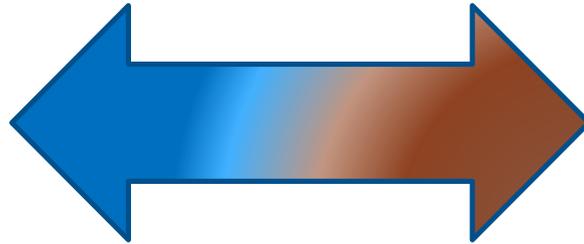
- Initial BARCT emission limits for burners based on emissions performance from vendor literature and source test results
- During previous Working Group Meeting, staff was requested to have additional discussions with vendors
- Stakeholders suggested splitting **metal heating** into two separate categories: **heat treating** and **heating/forging**
- Staff agrees and will re-evaluate the proposed NOx emission limit based on the suggested two categories
 - Seeking stakeholder input on updated categorization and temperature cutoffs

New Metal Heating Categories



Heat Treating

Metal Heating
now split into
two categories



Heating/Forging



Metal Heating Assessment

- Heat Treating

Re-Evaluation of Technology Assessment Overview

For each
new category

```
graph LR; A[For each new category] --> B[Re-evaluate Initial NOx BARCT Emission Limit]; B --> C[Calculate Cost-Effectiveness for Initial NOx Limit]; C --> D[Proposed NOx BARCT Limit];
```

Re-evaluate Initial NO_x
BARCT Emission Limit

Calculate Cost-Effectiveness
for Initial NO_x Limit

Proposed NO_x BARCT Limit

Re-Evaluation of Technology Assessment

Heat Treating

- Emission guarantees from 2 vendors received for heating applications
- Emission guarantees given for general “metal heating” applications
 - Staff applied guarantees to both heating treating and heating/forging categories
- Compared source test results of units equipped with burners from vendors or models specified in emission guarantees
 - Source test results of all other units also compared

Re-Evaluation of Technology Assessment

Heat Treating

Vendor	Emission Guarantee (ppm @ 3% O ₂)	Source Test Results (ppm @ 3% O ₂) 400-1,300 °F	Source Test Results (ppm @ 3% O ₂) 2,200-2,300 °F
Vendor A	30 ppm (All Temperatures)	8 units: 5-37 ppm 7 of 8 units: < 30 ppm	0 units
Vendor B	<u>Cold-Air Burners</u> 40-42 ppm (≤ 2,000 °F)* 50 ppm (≤ 2,000 °F)** <u>Regenerative Burners</u> 50 ppm (≤ 2,000 °F)* 57 ppm (2000-2,200 °F)*	3 units: 35-40 ppm All 3 units: 30-40 ppm	1 unit: 35 ppm 1 unit: 30-40 ppm
Remaining Units		39 units: 12-77 ppm 18 of 39 units: < 30 ppm 9 of 39 units: 30-40 ppm	4 units: 26-109 ppm 1 of 4 units: < 30 ppm

* 5 to 10% Excess Air

** > 10% Excess Air

Re-Evaluation of Technology Assessment

- Vendor guarantees range from 30 to 57 ppm
 - Partially dependent upon operating temperature
- Source tests confirm 30 ppm and 40 ppm limits achievable
 - 30 ppm: 25 of 50 units
 - 40 ppm: 3 of 5 units

Initial BARCT Emission Limit:
30 ppm (≤ 1,500 °F)
40 ppm (> 1,500 °F)

Updated BARCT Analysis

Heat Treating

	South Coast AQMD Regulatory Requirements	Existing Units (Source Testing)	Other California Air Districts	Technology Assessment	Initial BARCT Emission Limit
Previous Metal Heating BARCT Analysis	60 ppm	5-115 ppm 59 (33%) ≤ 30 ppm 31 (17%) ≤ 20 ppm	60 ppm	15 ppm (SCR) 20-30 ppm (Burner)	15 ppm (SCR) 20-30 ppm (Burner)
Revised Heat Treating BARCT Analysis	60 ppm	55 Units: 5-109 ppm* 26 (47%) < 30 ppm 14 (25%) 30-40 ppm	60 ppm	15 ppm (SCR) ≤ 1,500 °F: 30 ppm > 1,500 °F: 40 ppm (Burner)	15 ppm (SCR) ≤ 1,500 °F: 30 ppm > 1,500 °F: 40 ppm (Burner)

* Source test data has been updated since Technology Assessment originally presented during Working Group Meeting #3

Revised Initial BARCT Emission Limits

Heat Treating

Metal Heat Treating Revised Initial BARCT Emission Limits

(≥ 40 MMBtu/hr)

15 ppm
(SCR)

$\leq 1,500$ °F
(< 40 MMBtu/hr)

30 ppm
(Burner Replacement)

$> 1,500$ °F
(< 40 MMBtu/hr)

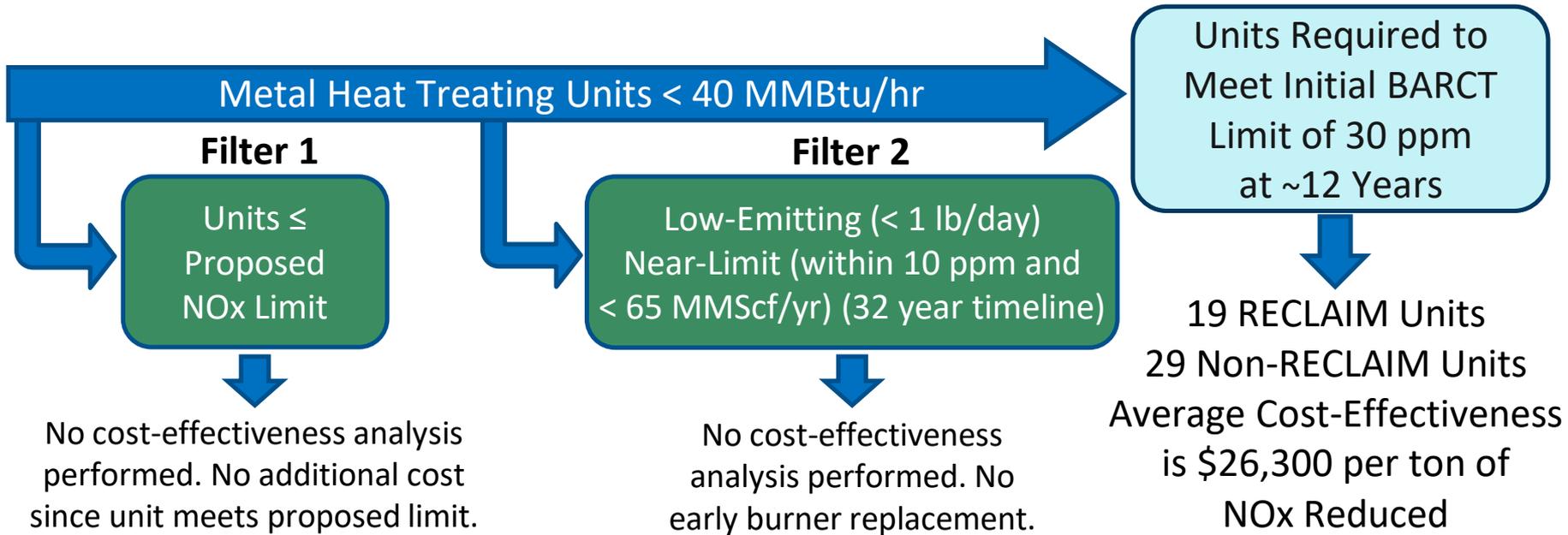
40 ppm
(Burner Replacement)

Cost-Effectiveness Analysis Conducted
Using Same Approach for Metal Melting

Cost-Effectiveness Analysis for Initial BARCT Limit of 30 PPM

Heat Treating

Units $\leq 1,500$ °F
< 40 MMBtu/hr



Proposed NOx BARCT limit for metal heat treating units

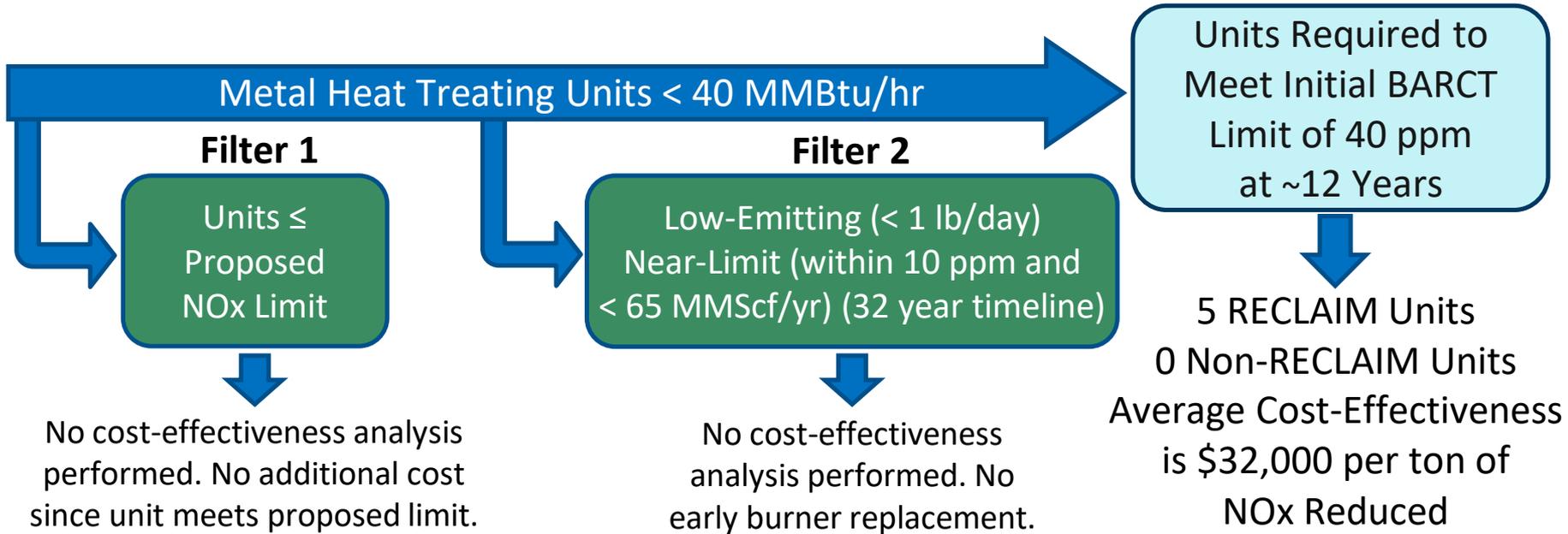
< 40 MMBtu/hr, $\leq 1,500$ °F is 30 ppm @ 3% O₂

Proposed maximum near-limit for this category is 40 ppm @ 3% O₂

Cost-Effectiveness Analysis for Initial BARCT Limit of 40 PPM

Heat Treating

Units > 1,500 °F
< 40 MMBtu/hr



Proposed NOx BARCT limit for metal heat treating units

< 40 MMBtu/hr, > 1,500 °F is 40 ppm @ 3% O₂

Proposed maximum near-limit for this category is 50 ppm @ 3% O₂

Cost-Effectiveness Analysis for Initial BARCT Limit of 15 PPM

Heat Treating
≥ 40 MMBtu/hr

- Submit applications by January 1, 2022
- Units must meet proposed NOx limit 18 months after Permit to Construct is issued
- 2 RECLAIM units* with average cost-effectiveness of \$20,100 per ton of NOx reduced
 - No non-RECLAIM units

**Proposed NOx BARCT limit for metal heat treating units
≥ 40 MMBtu/hr is 15 ppm @ 3% O₂**

* 1 unit already equipped with SCR

Summary of Proposed BARCT Limit Metal Heat Treating

Heat Treating

Category	Applicability	Rule 1147 Limit (@ 3% O2)	Proposed BARCT Limit (@ 3% O2)	Near-Limit Designation*	Baseline Emissions (TPD)	Emission Reductions by 2024** (TPD)
Heat Treating	< 40 MMBtu/hr (≤ 1,500 °F)	60 ppm	30 ppm	> 30 to ≤ 40 ppm	0.09	0.0006 (0.07 final)
	< 40 MMBtu/hr (> 1,500 °F)	60 ppm	40 ppm	> 40 to ≤ 50 ppm	0.04	0.004 (0.01 final)
	≥ 40 MMBtu/hr	60 ppm	15 ppm	Not Applicable	0.08	0.07

* Corrected to 3% O2

** Emission reductions are difference between permit level and BARCT level emissions

Total NOx emission reductions (RECLAIM and non-RECLAIM):
0.06 TPD by 2024 and 0.14 TPD at final implementation



Metal Heating Assessment

- Heating/Forging

Re-Evaluation of Technology Assessment

Heating/Forging

- Emission guarantees from 3 vendors received for forging applications
- Compared source test results of units equipped with burners from vendors or models specified in emission guarantees
 - Source test results of all other units also compared
- Temperature cutoff for heating/forging furnaces established at 2,000 °F based on multiple vendors' feedback

Re-Evaluation of Technology Assessment

Heating/Forging

Vendor	Emission Guarantee (ppm @ 3% O ₂)	Source Test Results (ppm @ 3% O ₂) 800-2,000 °F	Source Test Results (ppm @ 3% O ₂) 2,200-2,300 °F
Vendor A	30 ppm (All Temperatures)	23 units: 7-46 ppm 17 of 23 units: < 30 ppm 5 of 23 units: 30-40 ppm	0 units
Vendor B	<u>Cold-Air Burners</u> 40 ppm (≤ 2,000 °F)* 50 ppm (≤ 2,000 °F)** <u>Regenerative Burners</u> 50 ppm (≤ 2,000 °F)* 57 ppm (2000-2,200 °F)*	8 units: 25-45 ppm 2 of 8 units: < 30 ppm 4 of 8 units: 30-40 ppm	4 units: 35-48 ppm 1 of 4 units: 30-40 ppm
Vendor C	20 ppm (1,500-1,800 °F) 30 ppm (1,800-2,100 °F) 40-45 ppm (2,100-2,350 °F)	9 units: 18-70 ppm 1 of 9 units: < 30 ppm 0 of 9 units: 30-40 ppm	2 units: 49 and 85 ppm
Remaining Units		61 units: 11-87 ppm 10 of 87 units: < 30 ppm 11 of 87 units: 30-40 ppm	26 units: 18-54 ppm 7 of 26 units: < 30 ppm 7 of 26 units: 30-40 ppm

Re-Evaluation of Technology Assessment

- Vendor guarantees range from 20 to 57 ppm
 - Partially dependent upon operating temperature
- Source tests confirm 30 ppm and 40 ppm limits achievable
 - 30 ppm: 30 of 101 units
 - 40 ppm: 15 of 32 units

Initial BARCT Emission Limit:
30 ppm (≤ 2,000 °F)
40 ppm (> 2,000 °F)

* 5 to 10% Excess Air

** > 10% Excess Air

Updated BARCT Analysis

Heating/Forging

	South Coast AQMD Regulatory Requirements	Existing Units (Source Testing)	Other California Air Districts	Technology Assessment	Initial BARCT Emission Limit
Previous Metal Heating BARCT Analysis	60 ppm	5-115 ppm 59 (33%) ≤ 30 ppm 31 (17%) ≤ 20 ppm	60 ppm	SCR: 15 ppm Burner: 20-30 ppm	SCR: 15 ppm Burner: 20-30 ppm
Revised Heating/Forging BARCT Analysis	60 ppm	133 Units: 7-87 ppm* 37 (28%) < 30 ppm 28 (21%) 30-40 ppm	60 ppm	15 ppm (SCR) ≤ 2,000 °F: 30 ppm > 2,000 °F: 40 ppm (Burner)	15 ppm (SCR) ≤ 2,000 °F: 30 ppm > 2,000 °F: 40 ppm (Burner)

* Source test data has been updated since Technology Assessment originally presented during Working Group Meeting #3

Revised Initial BARCT Emission Limits

Heating/Forging

Metal Heating/Forging Revised Initial BARCT Emission Limits

(≥ 40 MMBtu/hr)

15 ppm
(SCR)

$\leq 2,000$ °F
(< 40 MMBtu/hr)

30 ppm
(Burner Replacement)

$> 2,000$ °F
(< 40 MMBtu/hr)

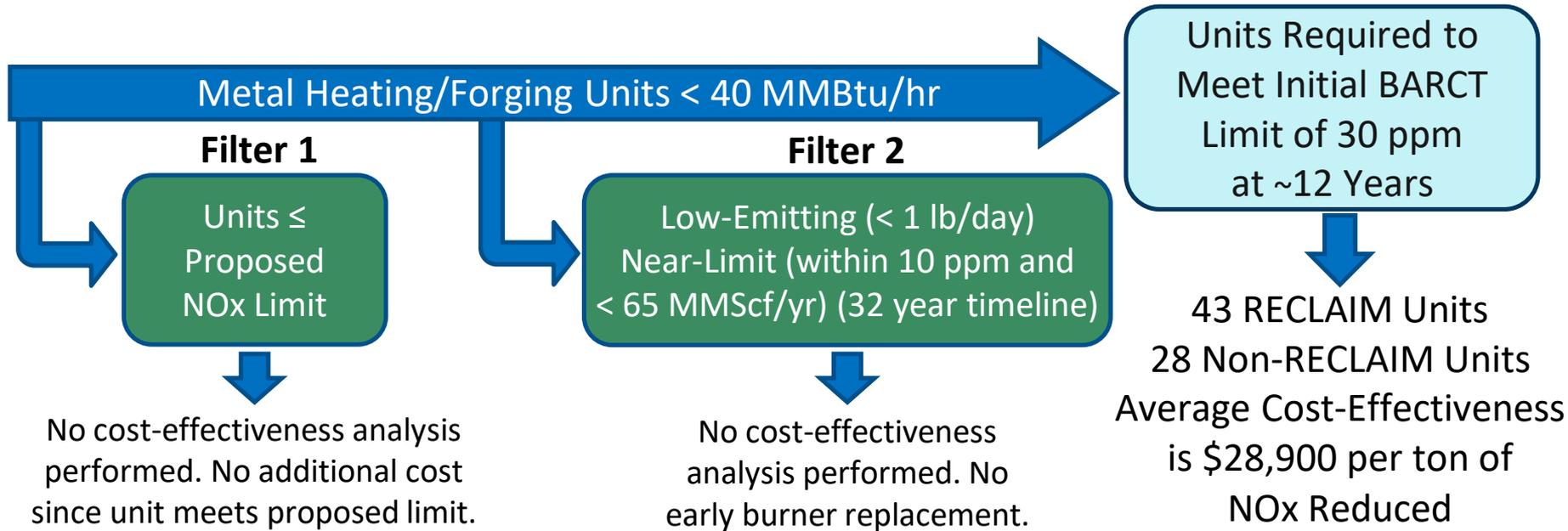
40 ppm
(Burner Replacement)

Cost-Effectiveness Analysis Conducted
Using Same Approach for Metal Melting and Metal Heat Treating

Cost-Effectiveness Analysis for Initial BARCT Limit of 30 PPM

Heating/Forging

Units $\leq 2,000$ °F
< 40 MMBtu/hr



Proposed NOx BARCT limit for metal heating/forging units

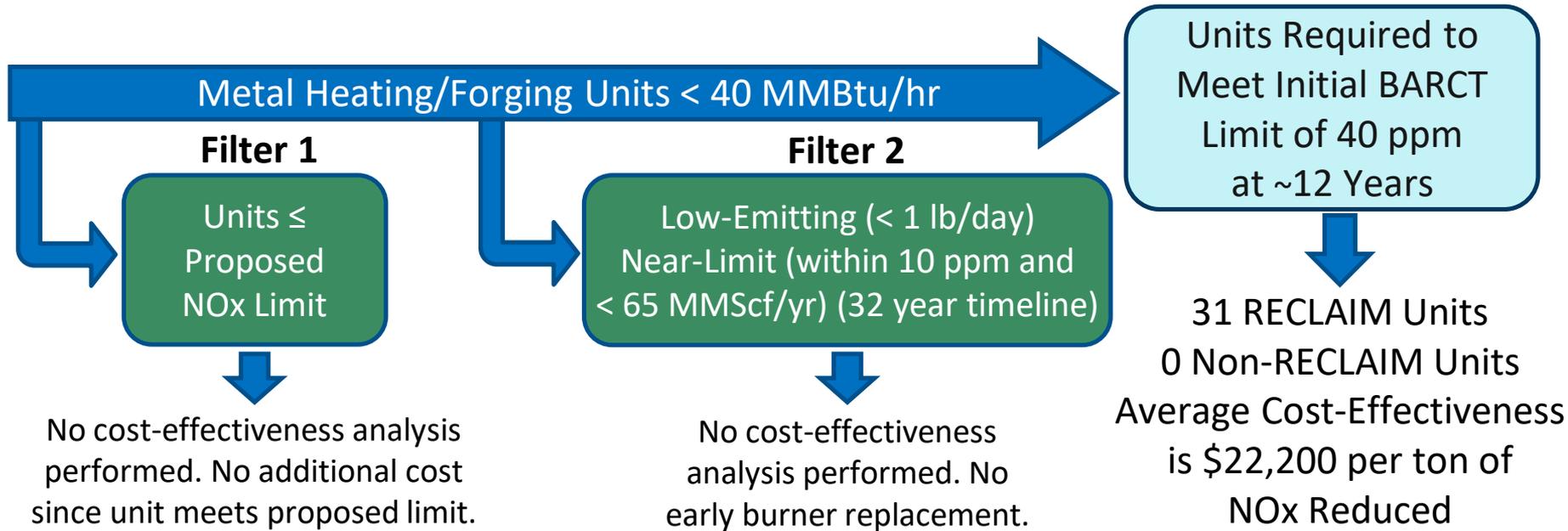
< 40 MMBtu/hr, $\leq 2,000$ °F is 30 ppm @ 3% O₂

Proposed maximum near-limit for this category is 40 ppm @ 3% O₂

Cost-Effectiveness Analysis for Initial BARCT Limit of 40 PPM

Heating/Forging

Units > 2,000 °F
< 40 MMBtu/hr



Proposed NOx BARCT limit for metal heating/forging units

< 40 MMBtu/hr, > 2,000 °F is 40 ppm @ 3% O₂

Proposed maximum near-limit for this category is 50 ppm @ 3% O₂

Cost-Effectiveness Analysis for Initial BARCT Limit of 15 PPM

Heating/Forging
≥ 40 MMBtu/hr

- Submit applications by January 1, 2022
- Units must meet proposed NO_x limit 18 months after Permit to Construct is issued
- 3 RECLAIM units* with average cost-effectiveness of \$8,600 per ton of NO_x reduced**
 - No non-RECLAIM units

**Proposed NO_x BARCT limit for metal heating/forging units
≥ 40 MMBtu/hr is 15 ppm @ 3% O₂**

* 1 unit already equipped with SCR

** Burners are regenerative burners (3x equipment and installation costs of cold-air burners); and assumes 80% efficiency for SCR for this application

Summary of Proposed BARCT Limit Metal Heating/Forging

Heating/Forging

Category	Applicability	Rule 1147 Limit (@ 3% O2)	Proposed BARCT Limit (@ 3% O2)	Near-Limit Designation*	Baseline Emissions (TPD)	Emission Reductions by 2024** (TPD)
Heating/ Forging	< 40 MMBtu/hr (≤ 2,000 °F)	60 ppm	30 ppm	> 30 to ≤ 40 ppm	0.13	0.03 (0.1 final)
	< 40 MMBtu/hr (> 2,000 °F)	60 ppm	40 ppm	> 40 to ≤ 50 ppm	0.1	0.03 (0.06 final)
	≥ 40 MMBtu/hr	60 ppm	15 ppm	Not Applicable	0.62	0.57

* Corrected to 3% O2

** Emission reductions are difference between permit level and BARCT level emissions

Total NOx emission reductions (RECLAIM and non-RECLAIM):
0.63 TPD by 2024 and 0.73 TPD at final implementation

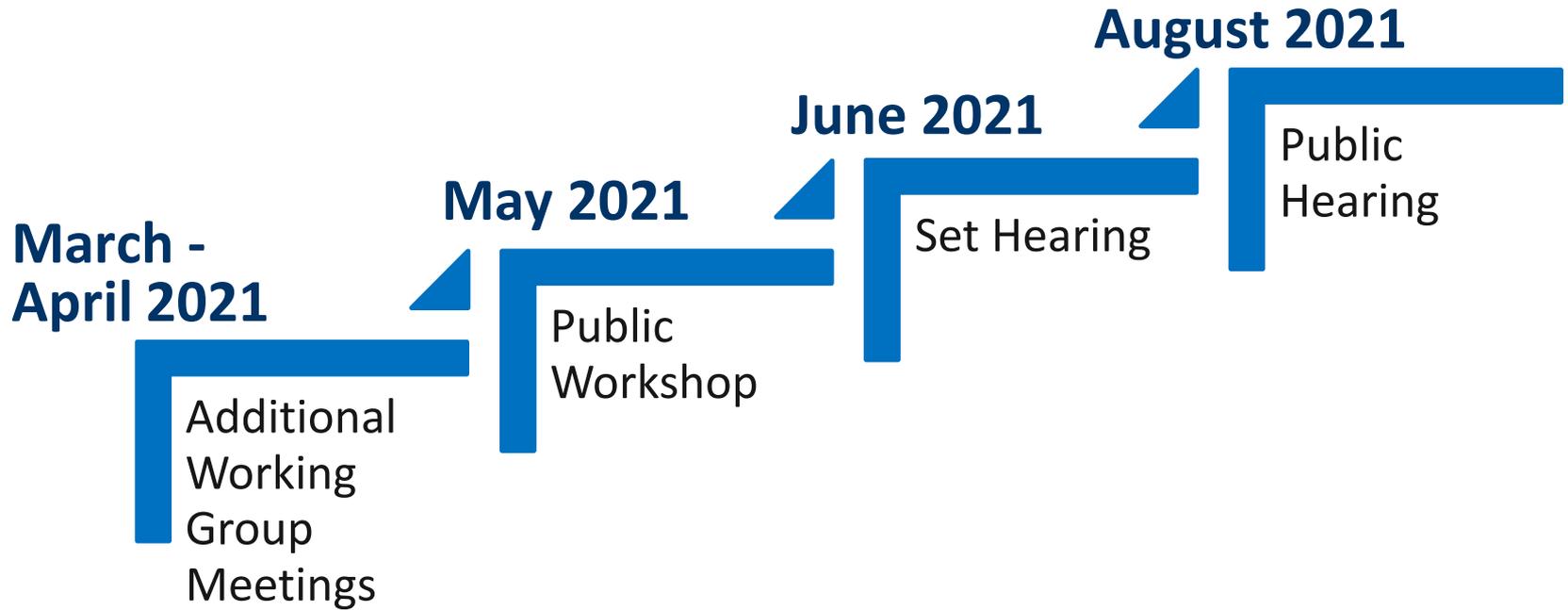
BARCT Limit Summary

Category	Applicability	Proposed BARCT Limit at 3% O ₂	Proposed Maximum Near-Limit at 3% O ₂
Metal Melting	< 40 MMBtu/hr (Cold-Air Burners)	40 ppm	50 ppm
	< 40 MMBtu/hr (Regenerative Burners)	40 ppm	50 ppm
	≥ 40 MMBtu/hr	15 ppm	Not Applicable
Metal Heat Treating	< 40 MMBtu/hr (≤ 1,500 °F)	30 ppm	40 ppm
	< 40 MMBtu/hr (> 1,500 °F)	40 ppm	50 ppm
	≥ 40 MMBtu/hr	15 ppm	Not Applicable
Metal Heating/Forging	< 40 MMBtu/hr (≤ 2,000 °F)	30 ppm	40 ppm
	< 40 MMBtu/hr (> 2,000 °F)	40 ppm	50 ppm
	≥ 40 MMBtu/hr	15 ppm	Not Applicable



Next Steps

Next Steps



Contacts

PR 1147.2	PAR 1147	RECLAIM Questions	General Questions
<p>James McCreary Air Quality Specialist jmccreary@aqmd.gov 909-396-2451</p> <p>Rodolfo Chacon Air Quality Specialist rchacon@aqmd.gov (909)396-2726</p> <p>Mike Morris Planning and Rules Manager mmorris@aqmd.gov 909-396-3282</p>	<p>Shawn Wang Air Quality Specialist swang@aqmd.gov 909-396-3319</p> <p>Gary Quinn, P.E. Program Supervisor gquinn@aqmd.gov 909-396-3121</p> <p>Michael Krause Planning and Rules Manager mkrause@aqmd.gov 909-396-2706</p>	<p>Gary Quinn, P.E. Program Supervisor gquinn@aqmd.gov 909-396-3121</p>	<p>Susan Nakamura Assistant Deputy Executive Officer snakamura@aqmd.gov 909-396-3105</p>