Maryland
Department of
the Environment

Unique Uses for Emissions Inventories in Maryland

Welcome to Baltimore

- During Your Visit
- Crab Cakes
- Microbrews
- Burger Cookies
- Camden Yards

Focus on Three Topics

- Use of CAMD data as a Regulatory Mechanism
- Locomotive Survey
- Temporal Improvements for Small EGUs in Modeling Inventories

CAMD Data as a Regulatory Mechanism

- Focused on coal-fired EGUs with SCR or SNCR post-combustion controls
- Baseline Starting Point - The year with the lowest recorded NO_X emission rate for an entire ozone season
- Using Daily CAMD data, compute the 123 30-day rolling averages for that ozone season.
  - (Ozone Season = 153 Days)

CAMD Data as a Regulatory Mechanism

- Selected the highest maximum 30-day rolling average from this 123 value dataset.

- This max 30-day rolling NO_X emission rate represents an “achievable” emission rate for the unit
  - Some have referred to this as “optimization” of the unit. We would disagree and refer to it as “achievable”
  - Since the unit has demonstrated that it is capable of hitting this rate over an entire ozone season

CAMD Data as a Regulatory Mechanism

- What can you do with this unit-specific "achievable" NO_X rate
  - Design/Set permissible NO_X rates per Unit
    - MDE has done this by setting "Indicator Rates" within our latest NO_X regulation for coal-fired EGUs
    - The "Indicator Rates" are not identical to the "Achievable" rates but they are similar
    - Requires EGU owner/operators to explain why they were unable to meet the "Indicator Rates"
  - Compare current NO_X rates to the "achievable" rate
    - How well are controls being run at the unit

CAMD Data as a Regulatory Mechanism

- What can you do with this unit-specific "achievable" NO_X rate
  - Moving outside of Maryland
  - Proposed a Grading System for Coal-fired EGUs to OTC
    - How well are controls being run at the unit
  - How was the Grading System Developed
    - Used the same methodology
    - Expanded the analysis to all Coal-fired EGUs with post combustion controls in the modeling domain

CAMD Data as a Regulatory Mechanism

- Placed individual units into three bins based upon the above rate comparisons
  - **BIN 1** - Review not needed
    - Equal or better performance compared to past - optimization underway
  - **BIN 2 -** Review needed but lower priority
    - Emission Rate is worse than the “Achievable” Rate but not Double
  - **BIN 3** - High priority for review
    - Emission Rate is more that Double the “Achievable” Rate

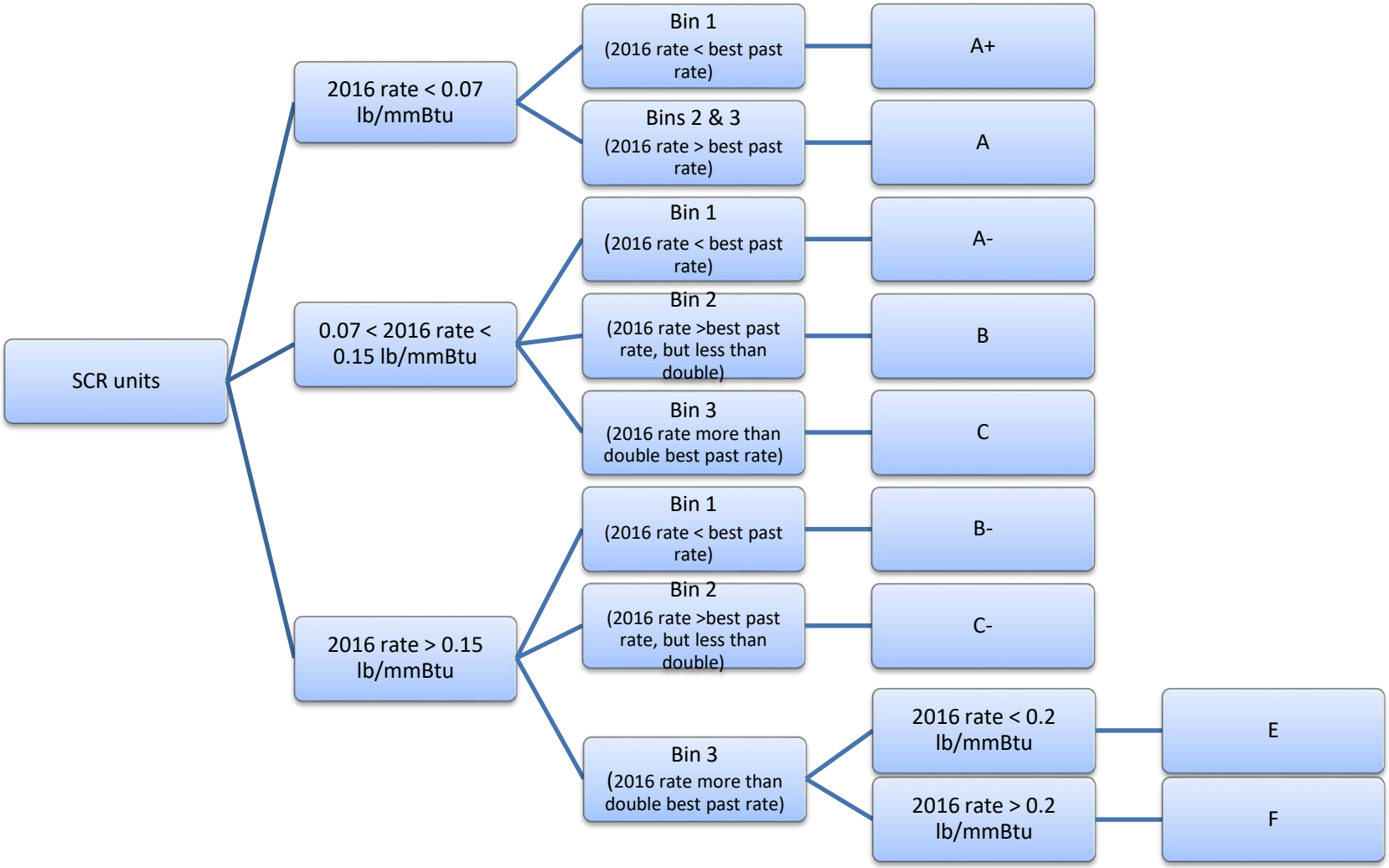
CAMD Data as a Regulatory Mechanism

- BIN 3 Units – Further Analysis
  - **BIN 3A** – NO_X Rate more than double but less than 0.1 lb NO_X/ mmBtu
  - **BIN 3B –** NO_X Rate more than double and between 0.1 – 0.2 lb NO_X / mmBtu
  - **BIN 3C** – NO_X Rate more than double and greater than 0.2 lb NO_X / mmBtu
    - Units of greatest concern

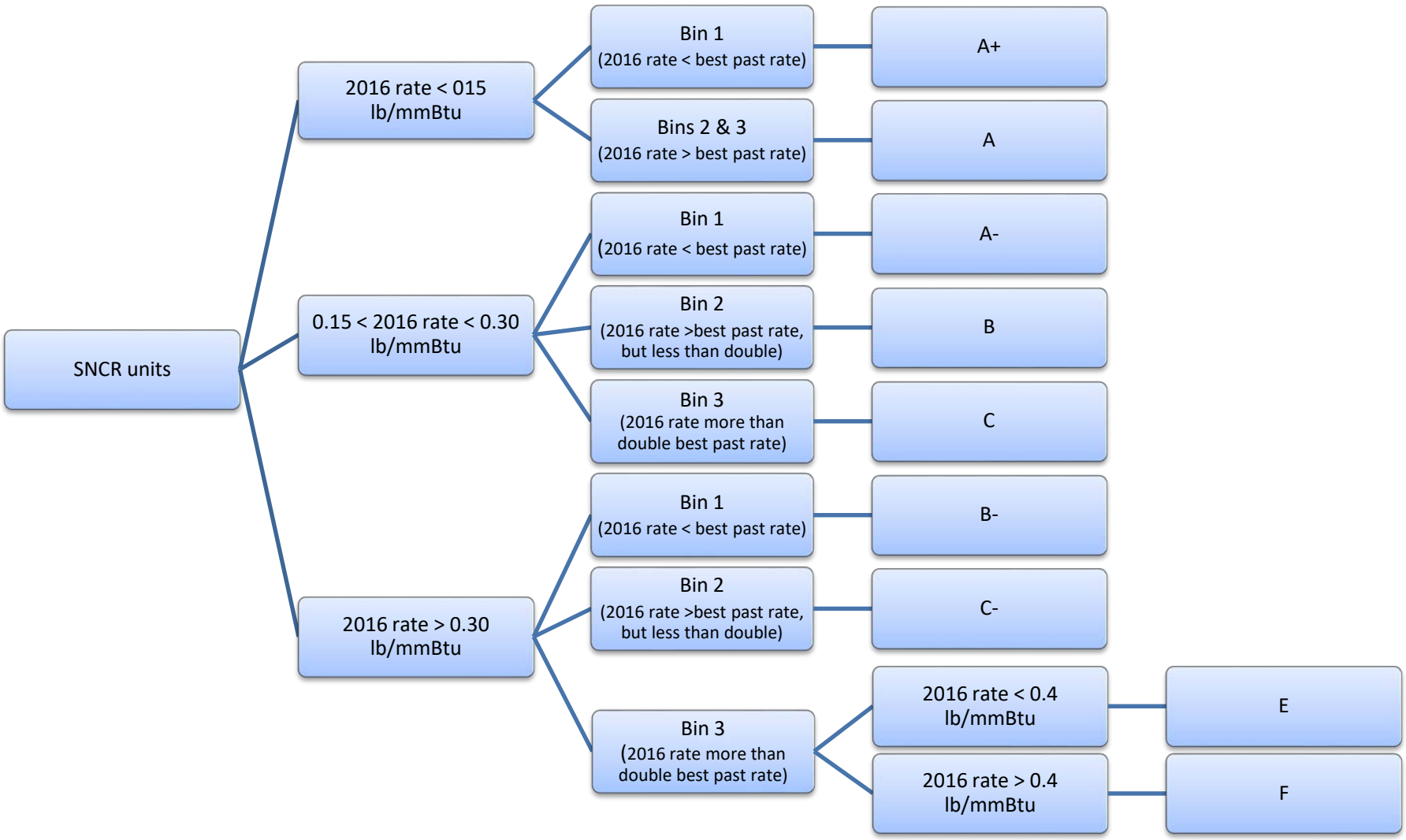
CAMD Data as a Regulatory Mechanism

- MDE has proposed the following grading system to the OTC
  - SCR Units
  - SNCR Units

SCR Grading System



SNCR Grading System



CAMD Data as a Regulatory Mechanism

- What can you do with this unit-specific "achievable" NO_X rate
  - Calculate excess NO_X emissions using the achievable rate instead of the actual rate reported to CAMD
    - Potential Lost Reductions - NO_X Ozone Season Total Emission
    - Potential Lost Reductions - NO_X Ozone Season Tons per Operating Day

Locomotive Survey

- Improvement of the major source categories of NO_X with the highest uncertainty.
- Survey of Rail Companies that Operate in MD – Letters were sent to:
  - Amtrak, Canton Railroad, CSX, Bay Coast Railroad
  - MD and Delaware, Maryland Midland Railway
  - Norfolk and Southern Railway
  - Western Maryland Scenic Railroad
  - Winchester and Western Railroad
  - MARC (Maryland Area Regional Commuter Train)
  - Walkersville Southern Railroad

Locomotive Survey

- Information Asked For - Survey Questions
  - Number of track miles used by the company for each Maryland County
  - Total Fuel used for line haul engines in Maryland Counties
  - The number of line locomotives
  - The number of Yard engines
  - Total Fuel used by the Yard engines per County
  - Type of Line Haul or Yard Engine
    - Tier 0, Tier 1 or Tier 2
    - Retrofits
    - Auxiliary Power Units

Locomotive Survey

- Information Received - 2014
  - In general the response was good
  - Estimated Fuel Use Per County
  - Track Miles Utilized per County
  - Number of Switchers
  - Number of Line Haul
- Hoping to receive additional data in 2017

Small EGU Temporalization for Modeling Inventories

- Poster Session
  - Hannah Ashenafi, Emily Bull
  - Use EMF to Develop Temporal Profiles for Non-CAMD EGUs
    - EMF – Emissions Modeling Framework that MARAMA has developed

Small EGU Temporalization for Modeling Inventories

- Background
  - Attempt to Improve Peak Day Emissions within modeling inventories
- Method
  - Use Annual Emissions for the Non-CAMD EGUs – Focus on NO_X Emissions
  - Develop Temporal Profiles of the Non-Baseload CAMD EGUs

Small EGU Temporalization for Modeling Inventories

- Analyze 2011 operating patterns of large peaking EGUs > 25 MW (using CAMD data) to create 12 "peaking profiles"
  - 4 regions: MANE-VU, LADCO, SESARM, CenSARA
  - 3 fuel bins: coal, oil, gas
- Summed the daily heat input for all units in each region/fuel bin, and divided by the total annual emissions to determine a fraction of annual heat input per day.

Small EGU Temporalization for Modeling Inventories

- The Temporal Profile is year-specific, region-specific and fuel-specific.
- Select Units from the ptnonipm source files
  - Complicated Procedure – Query created within SMOKE to identify the correct SCCs
- Application of the Temporal Profile
- Please see Hannah Ashenafi and Emily Bull Poster Session for detailed questions
  - Hannah Ashenafi hannah.ashenafi@maryland.gov
  - Emily Bull emily.bull@maryland.gov

Summary

- Maryland is looking at ways to apply all of the detailed emissions data that is collected
  - Using CAMD data for regulatory and compliance issues
- Maryland is looking to improve the major sources of NO_X with the highest uncertainty.
  - Locomotives
- Maryland is looking to improve our modeling inventories by the application of known hourly/daily emission profiles to sources with high variability
  - Small non-CAMD EGUs


Discussion