TCEQ

Attainment Demonstration Modeling and Emissions Banking and Trading Programs

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Today's Presentation

- Point Sources Overview
- Emissions Banking and Trading (EBT) Programs of Interest
- Impact of Attainment Demonstration (AD) Modeling on EBT Programs
- Impact of EBT Programs on AD Modeling
- Modeling Cap and Trade EBT Programs

Point Sources
Definition & Classification

Point Sources

Sources reporting annual emissions to
State of Texas Air Reporting System (STARS)

Electric Generating Units (EGU)*

Sources reporting hourly emissions to the Environmental Protection Agency's (EPA) Air Markets Program Database (AMPD)

**By definition, EGUs are capped sources as they are subject to the federal cap and trade program, Cross-State Air Pollution Rule (CSAPR)*

Non-Electric Generating Units (Non-EGU)

Nonattainment County (NAA) Capped Sources

Sources located in nonattainment counties and subject to cap and trade EBT programs

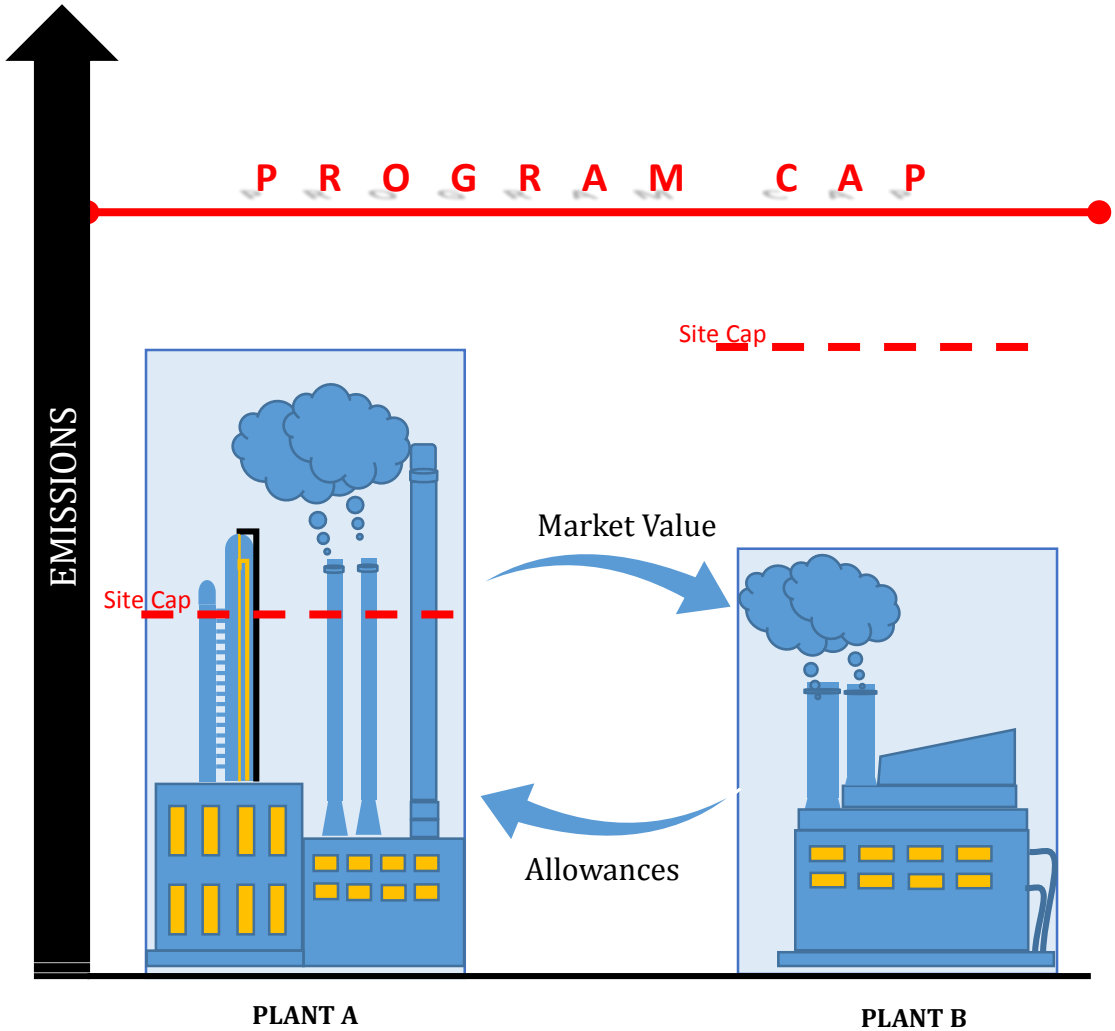
Attainment County Sources

Sources ***not*** located in nonattainment counties

NAA Non-Capped Sources

EBT Programs of Interest – Cap and Trade Programs

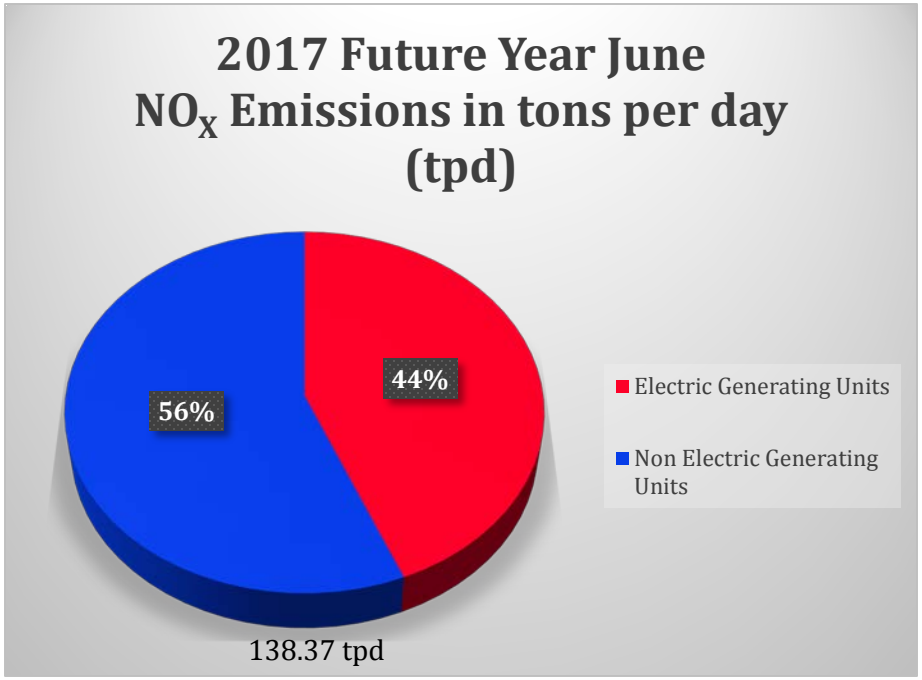
- Mass Emissions Cap and Trade Program (MECT)
  - Modeled as Nitrogen Oxides (NO_X) emissions of ***NAA capped sources***.
- Highly Reactive Volatile Organic Compounds (HRVOC) Emissions Cap and Trade Program (HECT)
  - Modeled as HRVOC emissions of ***NAA capped sources***.
- Cross-State Air Pollution Rule (CSAPR)
  - Modeled as NO_X emissions of ***EGUs***.
- Mandatory programs that cap emissions of subject sources

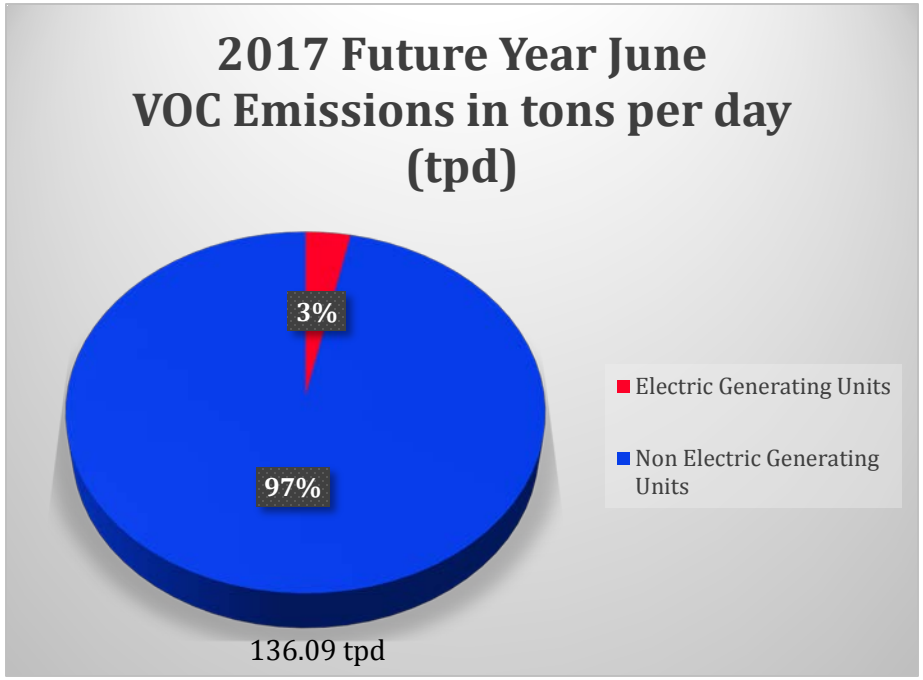


EBT Programs of Interest – Credit Programs

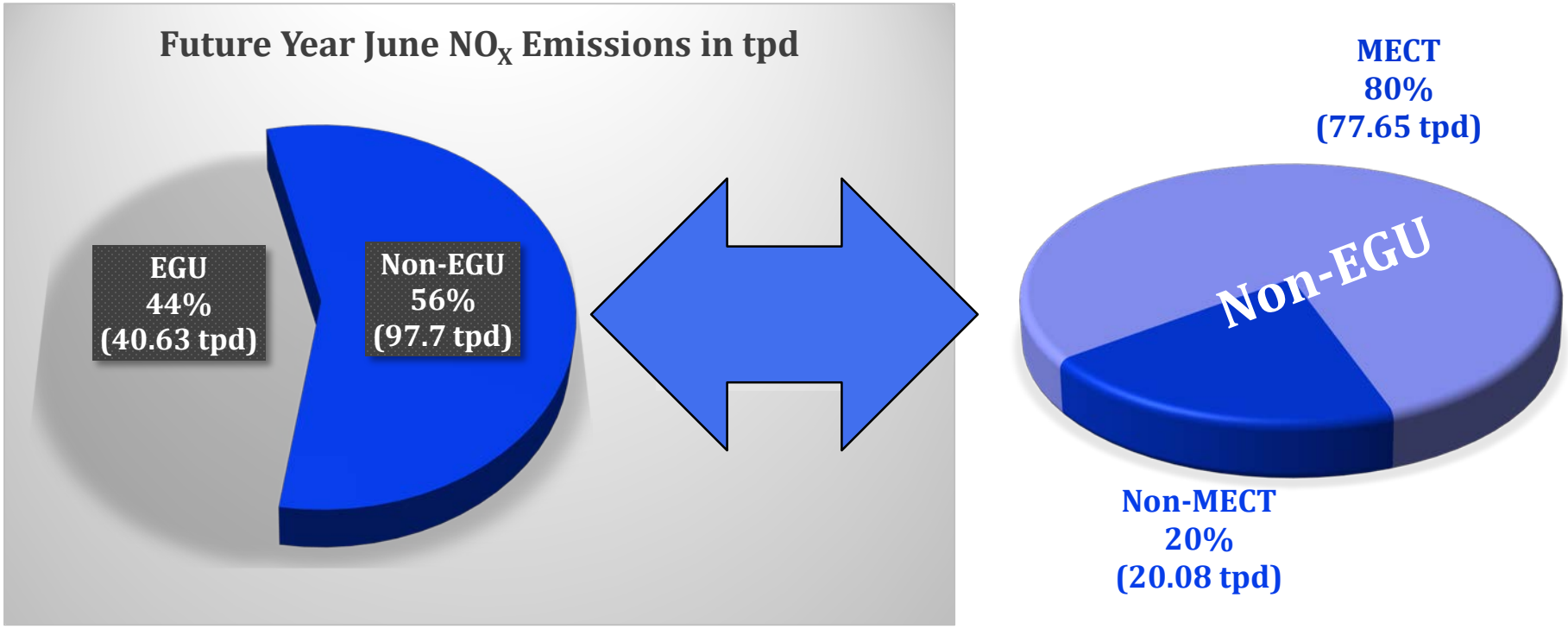
- Emission Credit Program
  - Emission Reduction Credits (ERC) are banked and traded as part of this program.
- Discrete Emission Credit Program
  - Discrete Emission Reduction Credits (DERC) and Mobile Discrete Emission Reduction Credits (MDERC) and banked and traded as part of this program.
- Credit programs are voluntary programs
- ERCs, DERCs, and/or MDERCs are collectively referred to as credits
- Credits currently in the Credit Registry (a.k.a The Bank) are modeled as growth of NO_X and Volatile Organic Compounds (VOC) emissions of ***NAA non-capped sources***

Houston-Galveston-Brazoria (HGB) Point Source Emissions





HGB NO_X Emissions by Point Source Classification



Impacts of AD Modeling on EBT Programs

- Determination of State Implementation Plan (SIP) emissions for credit generation
  - The SIP emissions used in credit generation are based on the actual emissions reported to STARS for the Projection Base (PB) year used in AD modeling:
    - 2014 for Non-EGUs and 2015 for EGUs
- Surpluses of existing ERCs
  - Inclusion of existing ERCs in the AD modeling ensures that the ERCs remain surplus to the SIP.
- Inter-Pollutant and Inter-Area Use of ERCs and DERCs
  - A photochemical modeling demonstration is required for Inter-Pollutant use of credits to show that reductions of one pollutant sufficiently offset emissions of another pollutant.
  - Similar to Inter-Pollutant, Inter-Area use of credits requires a photochemical modeling demonstration that shows reductions in one nonattainment area sufficiently offset emissions in another nonattainment area.
  - Upcoming Inter-Pollutant and Inter-Area demonstrations will use the 2017 future year modeling platform from the current HGB SIP AD modeling.

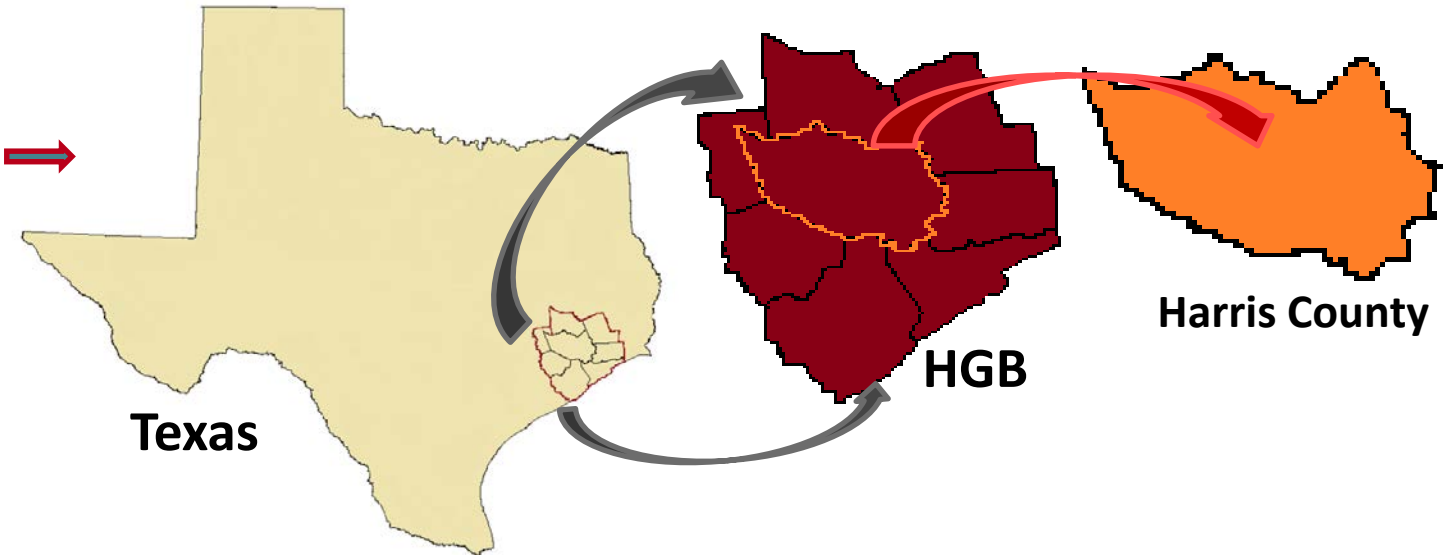
Impacts of EBT Programs on AD Modeling

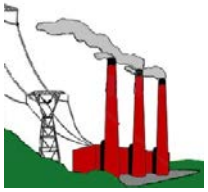
- Trading provisions in the cap and trade EBT Programs create uncertainty:
  - Location of future year emissions
  - Quantity of future year emissions

- Banked credits can re-enter the air shed in the future:
  - ERCs and DERCs are most often used as offsets in the permitting of new sources or modifications to existing sources;
  - The credits currently available in the Credit Registry are discounted based on the applicable offset ratio (1:1.3 in HGB) and used to represent growth, i.e., new emissions currently not in the PB year inventory.

Modeled Cap and Trade Programs in Texas

Program	CSAPR	MECT	HECT
Covered Geographic Area in Texas	Texas	HGB	Harris County
Pollutants	NO_X	NO_X	HRVOC
Types of Sources	EGU	Stationary point sources such as boilers, heaters, etc.	Stationary point sources in HRVOC service, such as flares, cooling towers, and vents





Future Year Emissions Modeling of Cap and Trade Sources

Information available to estimate future year emissions from sources subject to cap and trade are the following:

- The future year program cap
- The allocations to subject sources/sites
- Compliance summary from previous control periods

Two Data-Driven Emissions Modeling Approaches

Allocation-Based Approach

- Limit future year emissions to source allocations

Trend-Based Approach

- Use the trends from past control periods to estimate future emissions

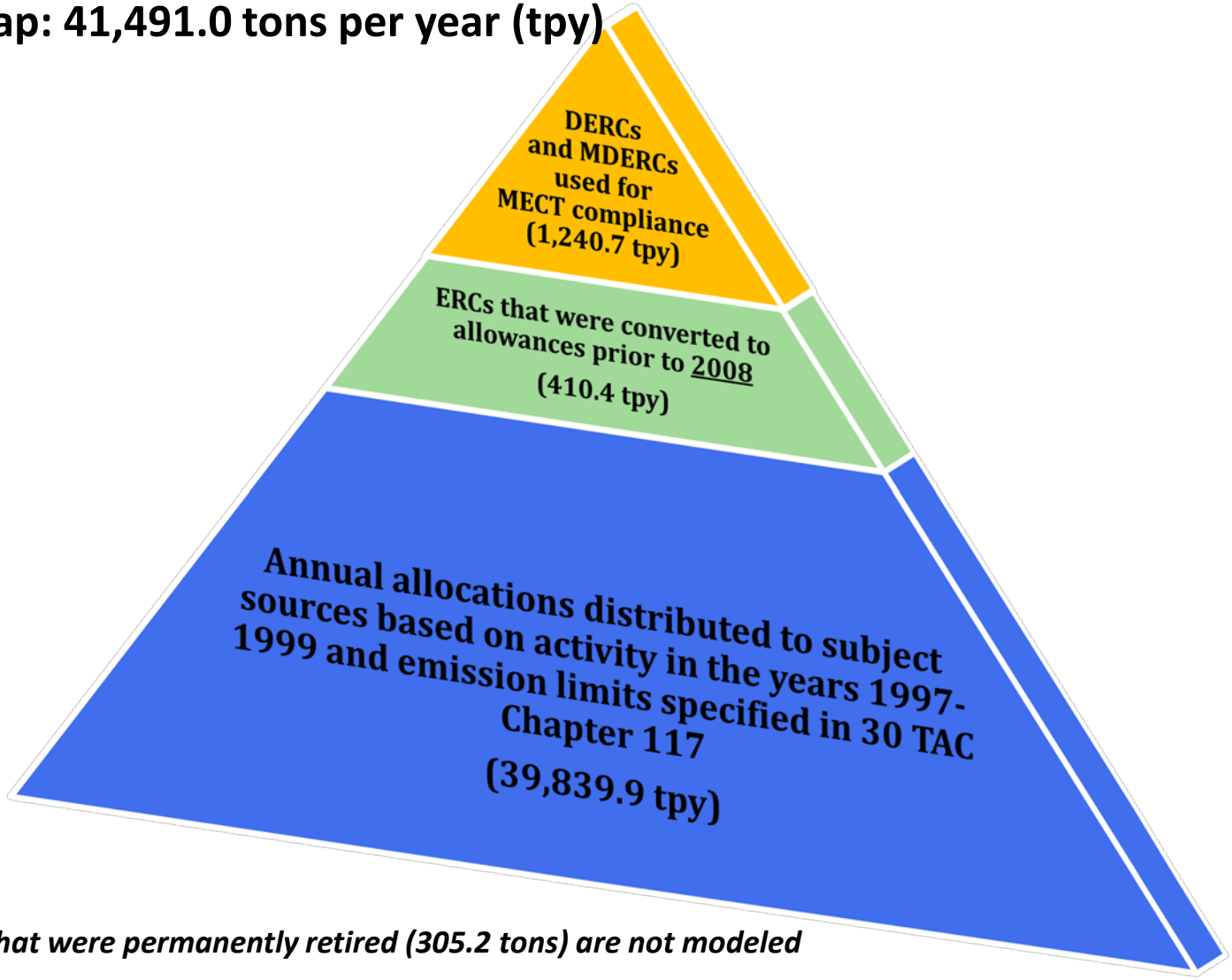
Modeled Future Year Program Cap

The cap and trade sources are collectively limited to a total amount of emissions in the future year.

Program	Control Period	2017 Program Cap for Texas Sources (tons/control period)
CSAPR	Ozone Season (May-September)	65,560
MECT	Annual	41,491.0
HECT	Annual	2,590.3

Modeled Future Year MECT Cap

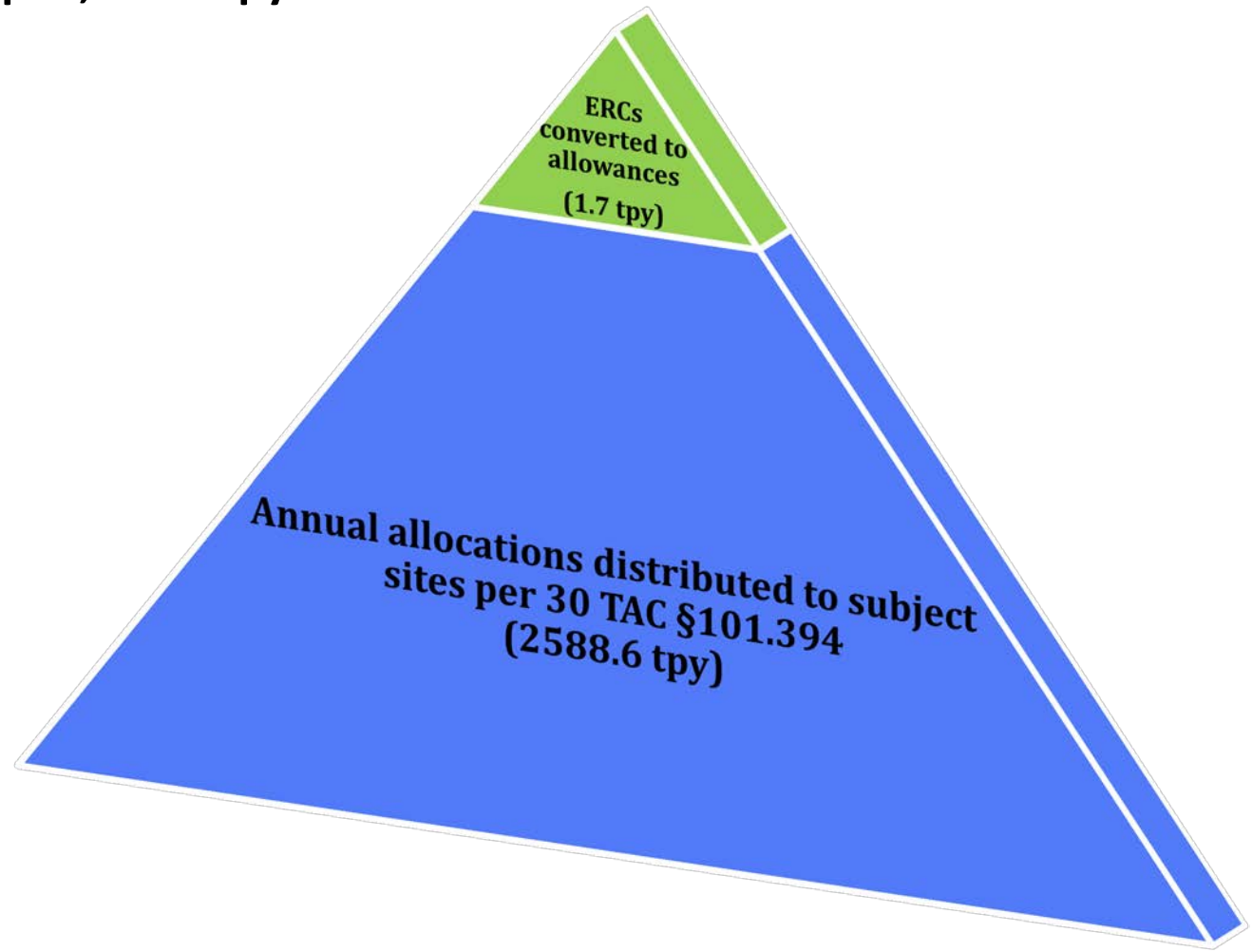
Modeled MECT Cap: 41,491.0 tons per year (tpy)



Note: MECT allowances that were permanently retired (305.2 tons) are not modeled

Modeled Future Year HECT Cap

Modeled HECT Cap: 2,590.3 tpy



Example of Future Year Allocation and Compliance

MECT Summary

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Control Period	2014	2015	2016
Current Allowance Balance	204.1	557.8	557.8
Vintage Allowance Balance	230.7	204.1	0.0

Facilities
Reports
Trades
Certifications

MECT Summary Detail -

Allowance Summary	2014	2015	2016
Certified Allocation	557.8	557.8	557.8
Previous Year Deficit with 10% Penalty	0.0	0.0	0.0
Total Current Allowances Traded IN +	905.0	905.0	905.0
Total Current Allowances Traded OUT +	905.0	905.0	905.0
Current Allowances Used for Compliance	353.7	0.0	0.0
CURRENT ALLOWANCE BALANCE	**204.1**	**557.8**	**557.8**
Vintage Allowances from Previous Year	230.7	204.1	0.0
Vintage Allowances Traded IN	0.0	0.0	0.0
Vintage Allowances Traded OUT	0.0	0.0	0.0
Vintage Allowances Used for Compliance	0.0	0.0	0.0
VINTAGE ALLOWANCE BALANCE	**230.7**	**204.1**	**0.0**

Allocations

Compliance Summary	2014	2015	2016
Total Reported Emissions	353.7	0.0	0.0
Quantification Penalty	0.0	0.0	0.0
Allowances Used for Compliance	353.7	0.0	0.0
Deficit	0.0	0.0	0.0
Current Allowances Remaining	204.1	557.8	557.8
Vintage Allowances Expired	230.7	0.0	0.0

2014
Compliance Summary

Assumptions of the Two Emissions Modeling Approaches

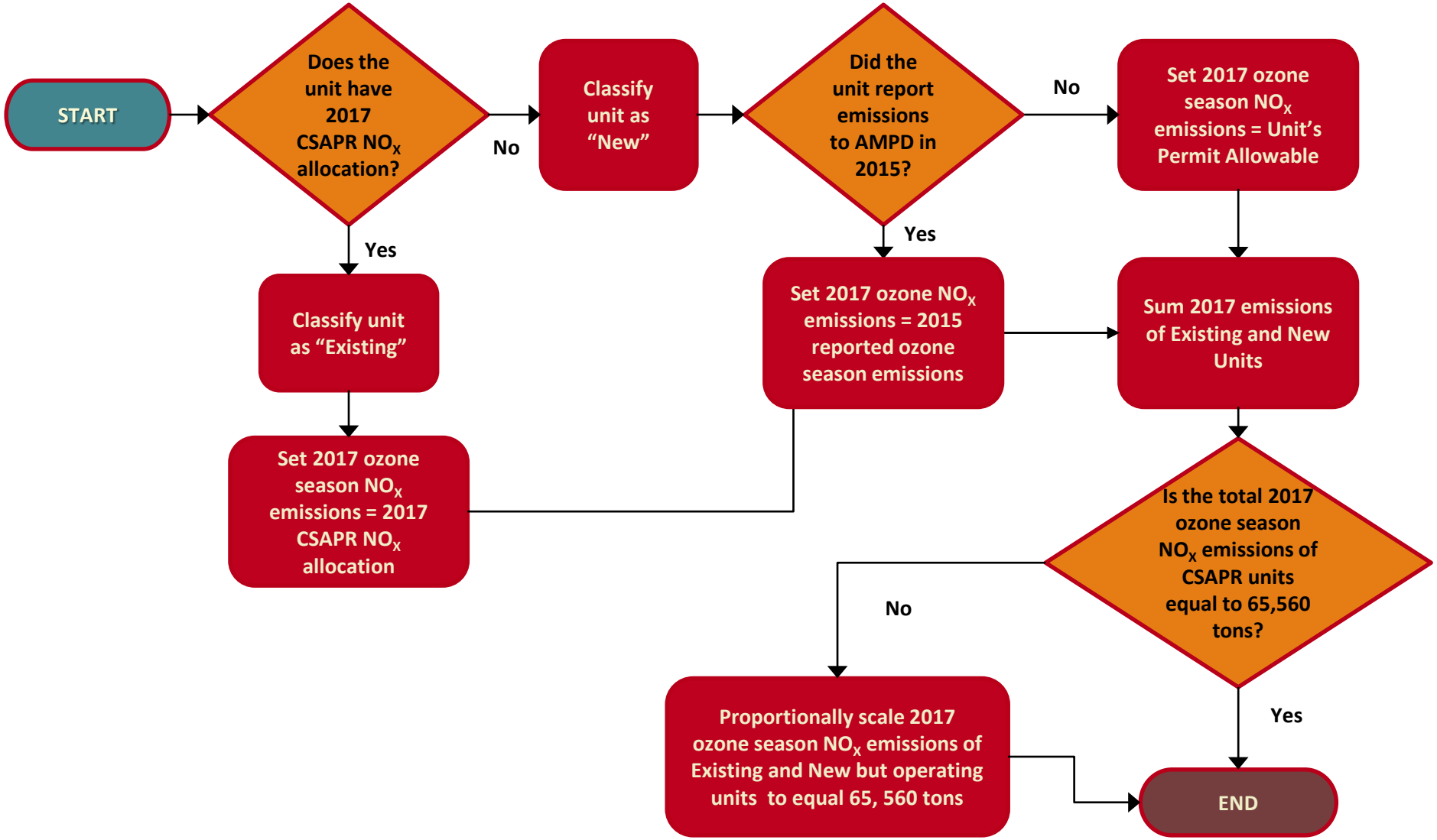
- The total emissions from sources subject to a cap and trade program will not exceed that program's future year program cap.
- Companies have three compliance options for each control period.
  - Site Emissions < Site Allocation
  - Site Emissions > Site Allocation
  - Site Emissions = Site Allocation
- Companies with sources subject to cap and trade programs generally follow a certain compliance pattern and the pattern will not change without major changes to:
  - the company (shutdowns, mergers, etc.); or
  - the program (reallocation, phase down, other regulatory changes).

Allocation-Based Emissions Modeling Approach

1. Subject sources are divided into two categories:
   - Existing; or
   - New Units.
2. Future emissions of existing units with an allocation are limited to the allocation amount.
3. Future emissions of new units with reported emissions in the PB year are set to reported emissions from AMPD.
4. Future emissions of newly permitted but not operating units are set to their permit allowable.
5. The total future year program cap is modeled by scaling the future emissions of existing and new but operating units proportionally.

For example: EGUs subject to CSAPR are modeled using an allocation-based approach.

Allocation-Based 2017 Emissions for CSAPR Units



Trend-Based Future Year Emissions Modeling

1. Determine *Site Cap Gap* for each site and each control period and tag each site as "*potential Seller*" or "*potential Buyer.*"

   $\boldsymbol{Site\ Cap\ Gap} = Annual\ Allocation - Actual\ Emissions$

   $\boldsymbol{Site\ Cap\ Gap} > \mathbf{0}$ implies site is a potential "Seller" (spatial or temporal).

   $\boldsymbol{Site\ Cap\ Gap} < \mathbf{0}$ implies site is a potential "Buyer" (spatial or temporal).

2. For each site, count the number of control periods that the site was a "*potential Seller*" or "*potential Buyer.*"

3. A site has a trading trend if the site is a potential ***"Seller" or "Buyer"*** for **80%** of the control periods.

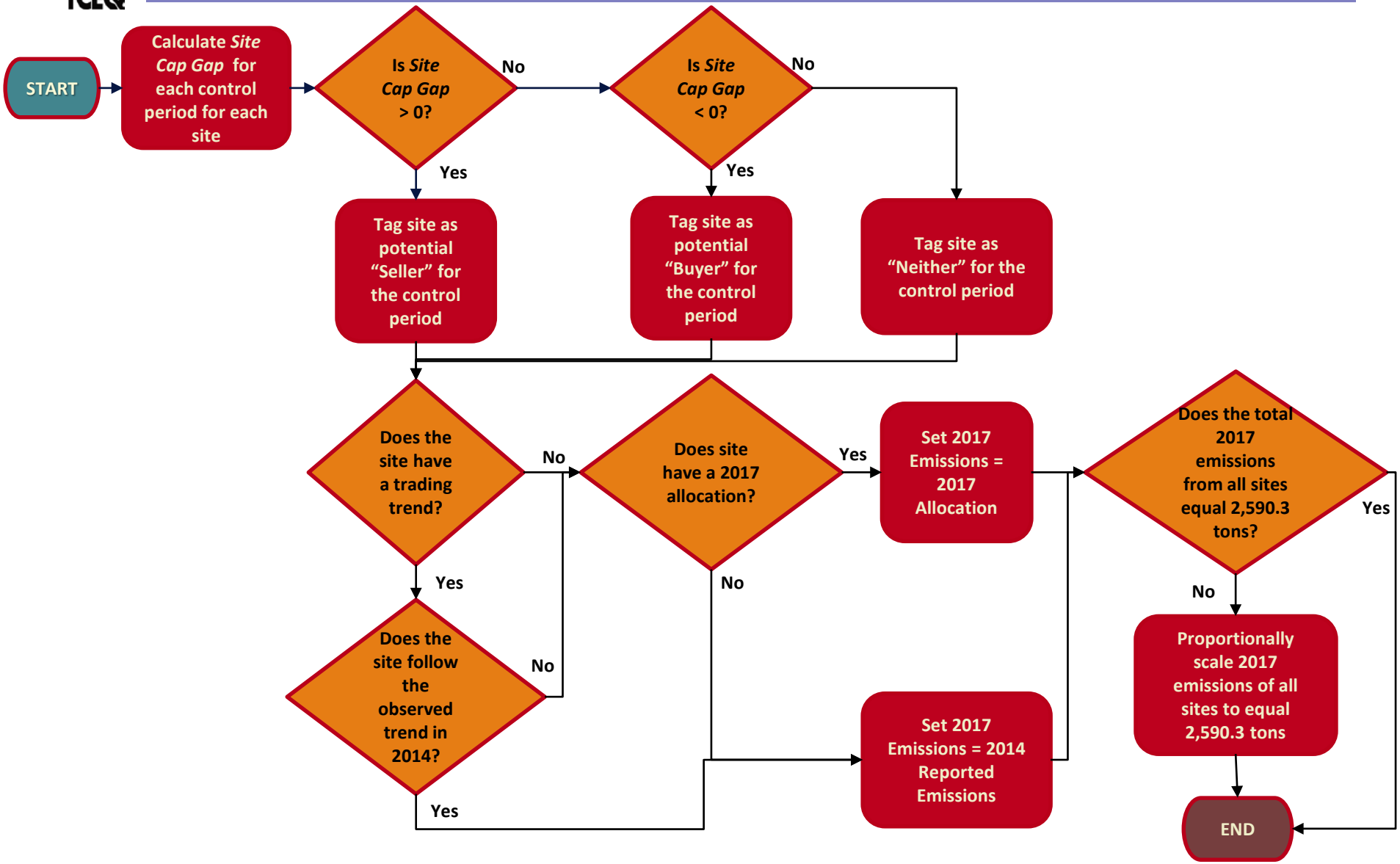
4. Verify if the site followed the trading trend in the PB year.

5. If the site had a trading trend ***and*** followed the trend in the PB year, then set 2014 reported emissions as future year emissions.

6. If the site did not have a trading trend ***or*** did not follow the trend in PB year, then set the future year allocation as future year emissions.

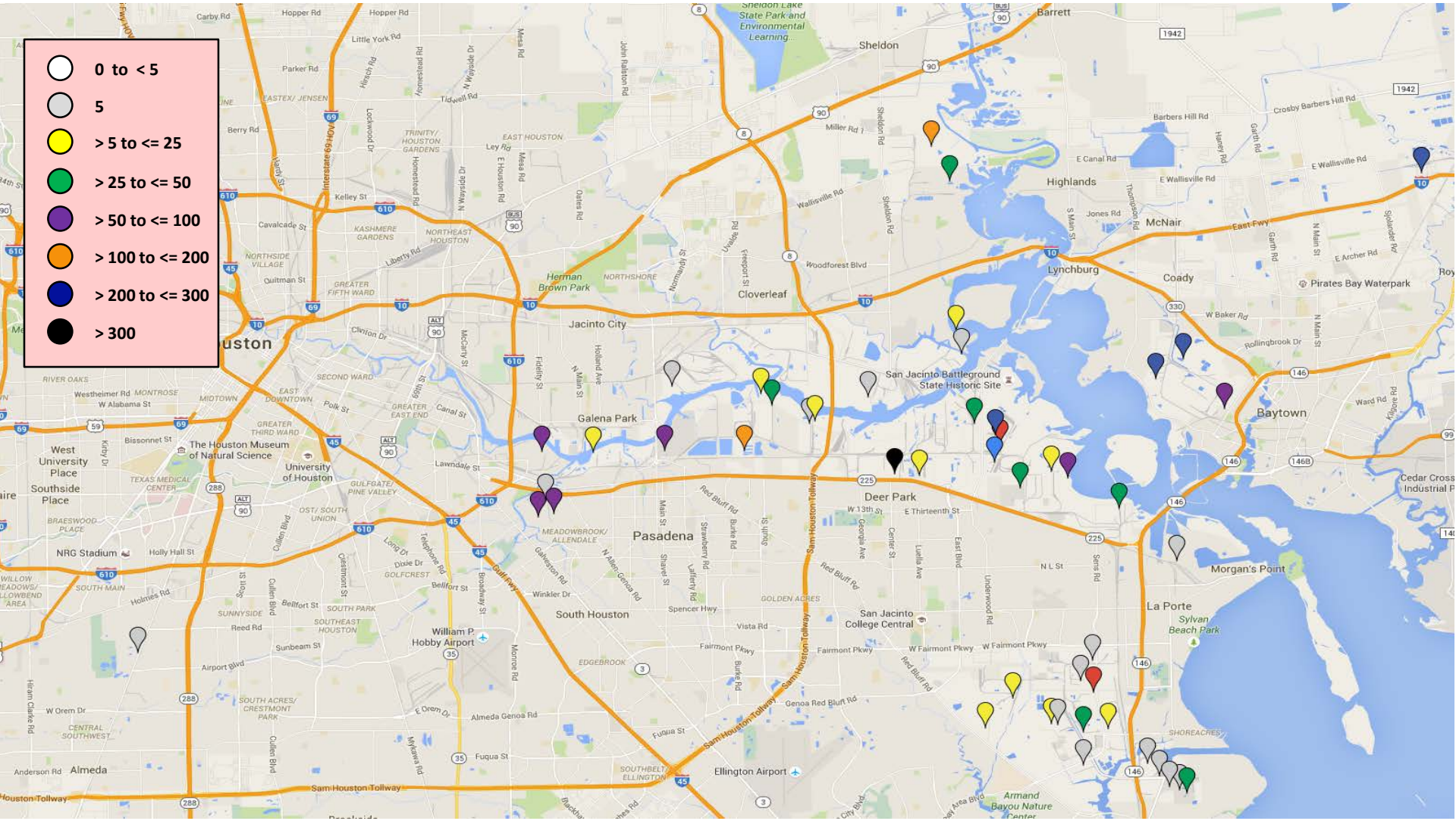
7. Ensure that the total future year program cap is modeled by proportionally scaling all sites to the cap.

Trend-Based 2017 Emissions for HECT Units



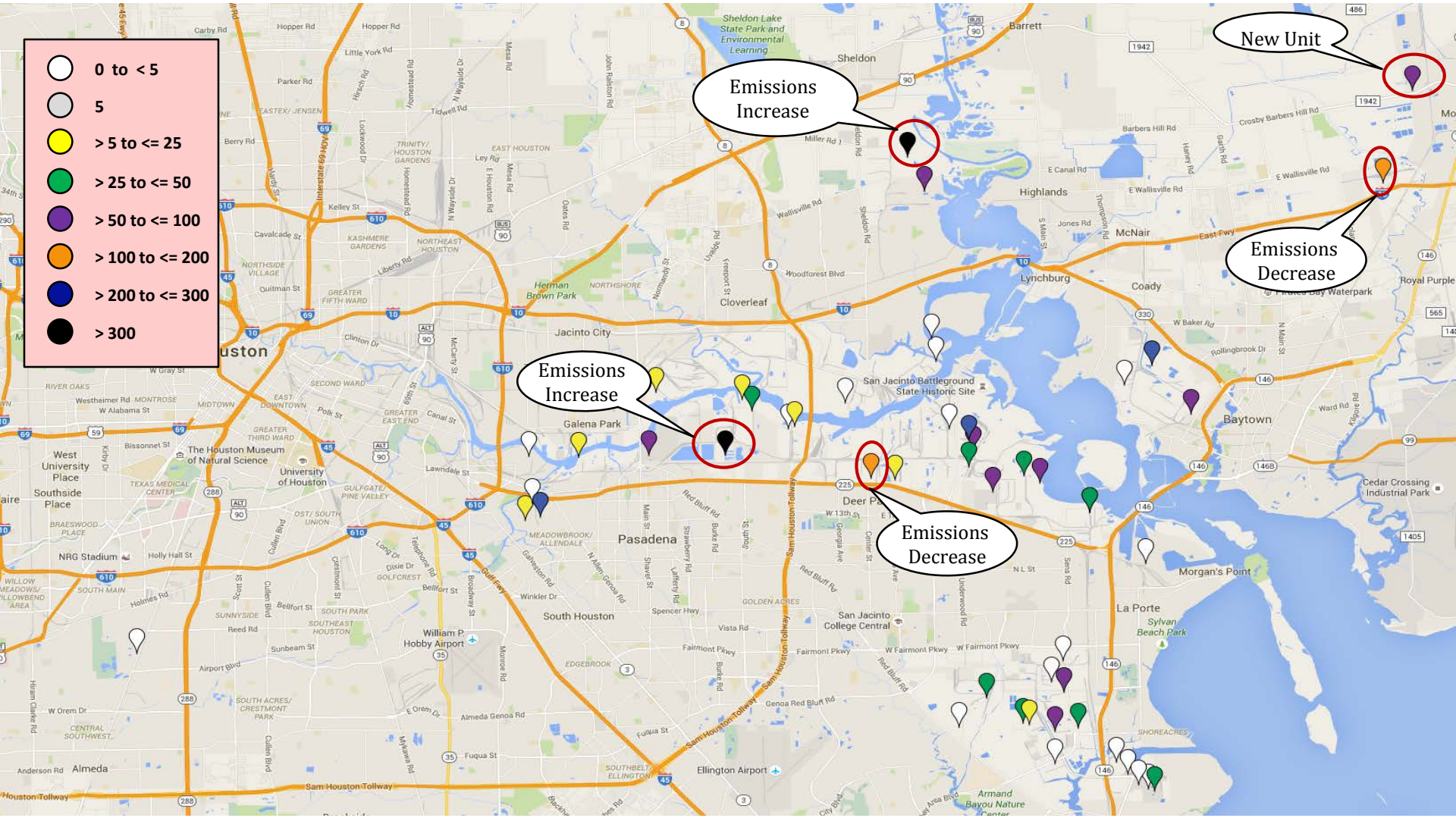
Allocation-Based Approach vs Trend-Based Approach
HECT Example

Future year emissions (tpy) of sources subject to HECT determined by the Allocation-Based approach



Allocation-Based Approach vs Trend-Based Approach
HECT Example

Future year emissions of sources subject to HECT determined by the Trend-Based approach



Advantages of Trend-Based Future Year Emissions Modeling

- The trend-based approach accounts for trading of allowances.
- This approach results in a more accurate spatial representation of subject sources based on the latest available actual emissions information.
- This approach does not artificially place an emissions limit on individual sources.
- New sources that do not receive an allocation are modeled if they had emissions in the PB year.
- The approach is transparent and uses data that is publicly available.
  - Annual emissions and allocation data for MECT and HECT sites were obtained from the TCEQ's EBT's Information Management System (Banking IMS).

QUESTIONS?

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air modeling data analysis