



# Modeling the Credit Registry

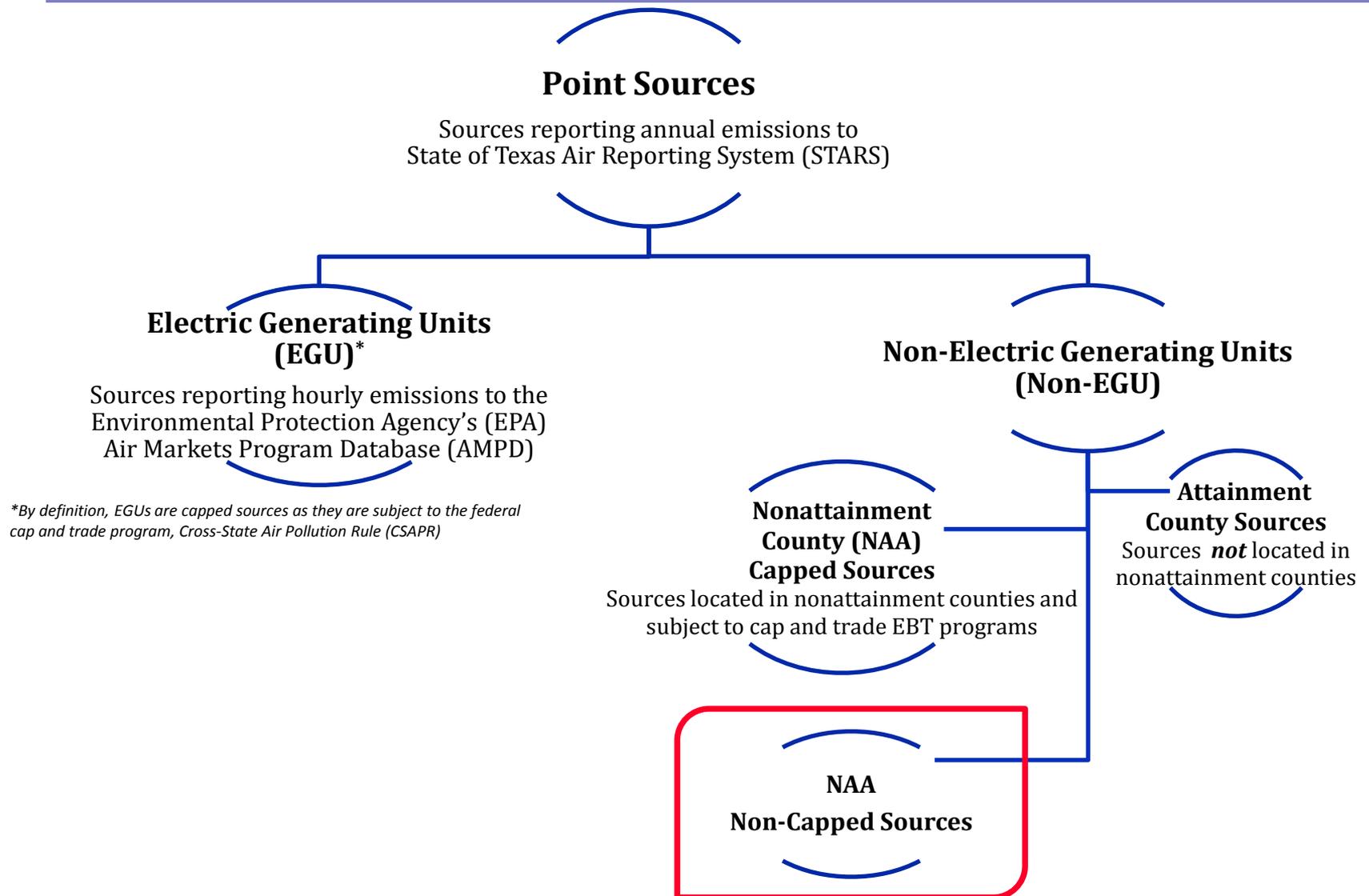
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Southeast Texas Photochemical Modeling Technical Committee Meeting  
July 26, 2016

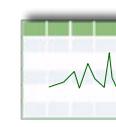


# Point Sources Definition & Classification





Bank



Analysis



Model

## OVERVIEW

THE BANK

THE BANK FROM A FUTURE MODELING PERSPECTIVE

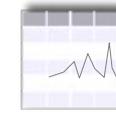
TWO DECIDING FACTORS OF FUTURE EMISSIONS

THE KEY COMPARISON

CURRENT MODELING



Bank



Analysis



Model

## THE CREDIT REGISTRY (a.k.a. The Bank)

- ❖ Repository for the emission reduction credits (ERC) and discrete emission reduction credits (DERC) of the Emissions Banking and Trading (EBT) credit programs.
- ❖ Credits represent emissions that are available to re-enter the air shed.





Bank



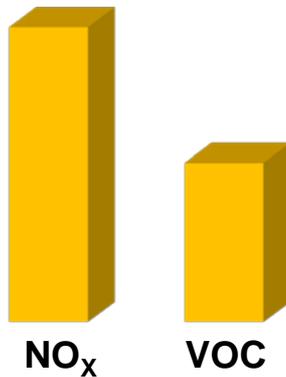
Analysis



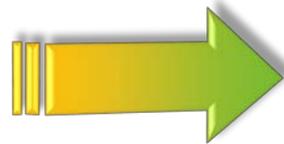
Model

## ATTAINMENT MODELING AND THE BANK

Current Year



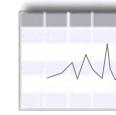
Attainment Year



- ❖ Attainment demonstration modeling considers the influence of the Bank in the Attainment Year (Future Emissions).



Bank



Analysis



Model

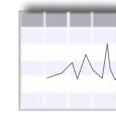
## ATTAINMENT MODELING AND THE BANK

**Question:** For attainment modeling, to which point sources should the Bank be distributed in the Future Year?

- Options:**
- a) Attainment County Sources
  - b) NAA Capped Sources: MECT, HECT, and CSAPR
  - c) NAA Non-Capped Sources



Bank



Analysis



Model

## ATTAINMENT MODELING AND THE BANK

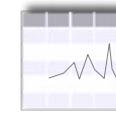
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**Options:**

- a) Attainment County Sources
- b) NAA Capped Sources: MECT, HECT, and CSAPR
- c) NAA Non-Capped Sources



Bank

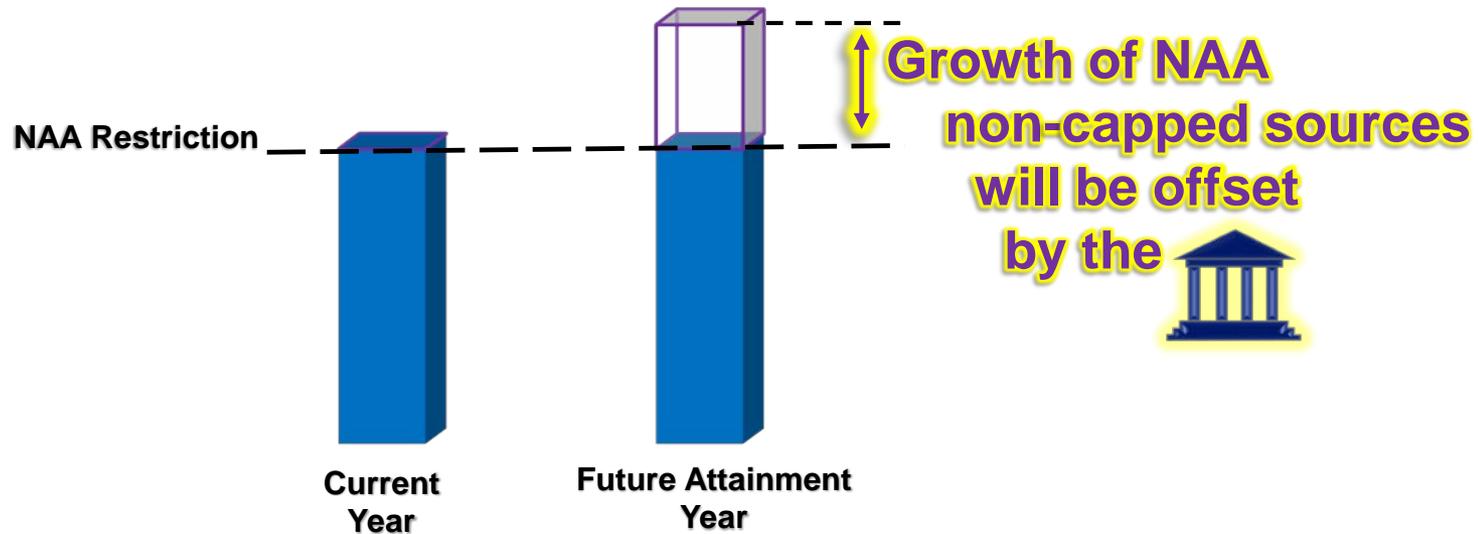


Analysis



Model

## FUTURE MODELING PERSPECTIVE



- ❖ NAA non-capped point sources will achieve growth by offsetting increases in  $\text{NO}_x$  and VOC emissions with credits from the Bank.



Bank

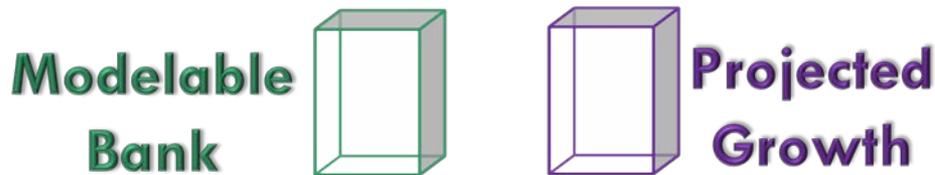


Analysis

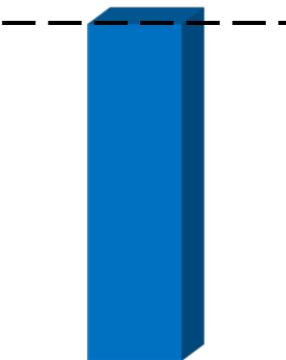


Model

## THE ANALYSIS: A KEY COMPARISON

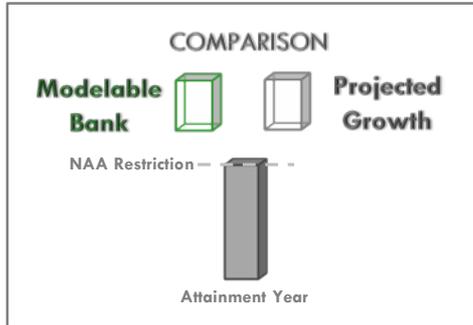


NAA Restriction



Attainment Year

- ❖ Future Emissions of non-capped NAA sources are limited to the smaller of the Modelable Bank or Projected Growth.



## DERIVING THE MODELABLE BANK

- 1** Take a snapshot of the Bank.
- 2** Remove  $\text{NO}_x$  DERCs and MDERCs used for MECT compliance.
- 3** Discount based on NAA offset ratio.
- 4** Convert the credits from tons per year (tpy) to tons per day (tpd).



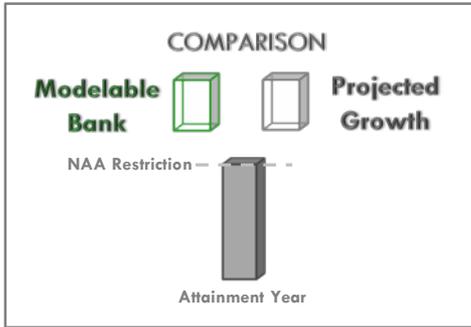
Bank



Analysis



Model



## MODELABLE BANK EXAMPLE

### NO<sub>x</sub> ERCs

**1** Current Snapshot **274.4 tpy NO<sub>x</sub>**

The Registry as of:  
3-31-16

NO <sub>x</sub> ERCs	
Certificate Number	Ton Amount
2XXX	39.3
2XXX	7.6
2XXX	2.5
2XXX	0.1
2XXX	1.2
<b>Total NO<sub>x</sub> ERCs</b>	<b>274.4</b>



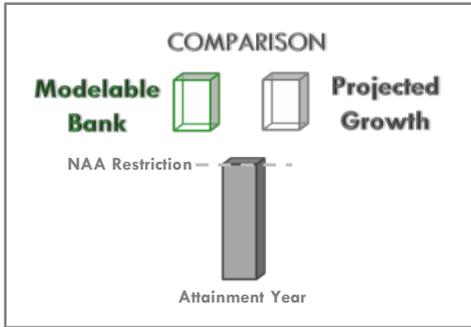
Bank



Analysis



Model



## MODELABLE BANK EXAMPLE

### NO<sub>x</sub> ERCs

**1** Current Snapshot    274.4 tpy NO<sub>x</sub>

**2** Remove DERCs & MDERCs for MECT    **274.4 tpy NO<sub>x</sub>**

This step applies only for NO<sub>x</sub> DERCs and MDERCs.



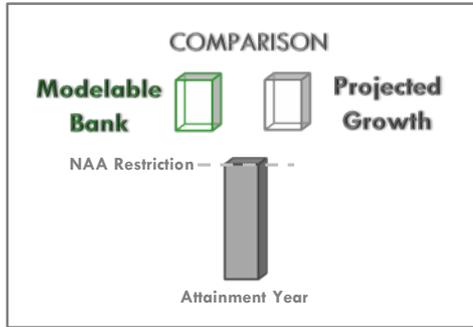
Bank



Analysis



Model



## MODELABLE BANK EXAMPLE

### NO<sub>x</sub> ERCs

- 1 Current Snapshot 274.4 tpy NO<sub>x</sub>
- 2 Remove DERCs & MDERCs for MECT 274.4 tpy NO<sub>x</sub>
- 3 Discount Offset Ratio **211.1 tpy NO<sub>x</sub>**

HGB NAA Offset Ratio is 1:1.3

$$274.4 \text{ tons credit} \left( \frac{1 \text{ ton new emis}}{1.3 \text{ tons credit}} \right) =$$

**211.1 tons new emis**



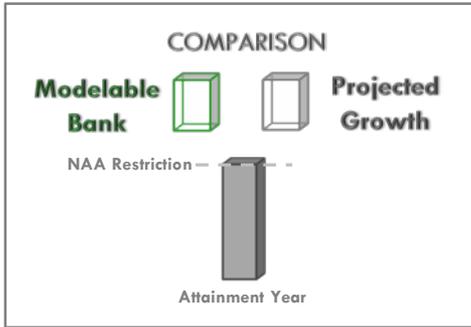
Bank



Analysis



Model



## MODELABLE BANK EXAMPLE

### NO<sub>x</sub> ERCs

**1** Current Snapshot 274.4 tpy NO<sub>x</sub>

**2** Remove DERCs & MDERCs for MECT 274.4 tpy NO<sub>x</sub>

**3** Discount Offset Ratio 211.1 tpy NO<sub>x</sub>

**4** Convert tpy to tpd **0.6 tpd NO<sub>x</sub>**

HGB Ozone Season is  
365 days/year

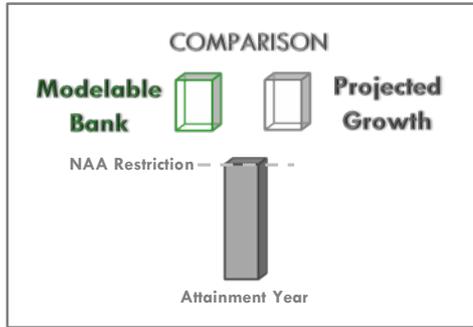
$$\left( \frac{211.1 \text{ tons NO}_x}{\text{year}} \right) \left( \frac{1 \text{ year}}{365 \text{ days}} \right) = 0.6 \text{ tpd NO}_x$$



Bank

Analysis

Model



## MODELABLE BANK EXAMPLE

### NO<sub>x</sub> DERCs

1 Current Snapshot

**34,380.3 tons NO<sub>x</sub> DERCs**  
**240.7 tons NO<sub>x</sub> MDERCs**

The Registry as of: 3-31-16

NO <sub>x</sub> DERCs	
Certificate Number	Ton Amount
D3XXX	39.3
D3XXX	7.6
D3XXX	2.5
D3XXX	0.1
D3XXX	1.2
<b>Total NO<sub>x</sub> DERCs</b>	<b>34,380.3</b>

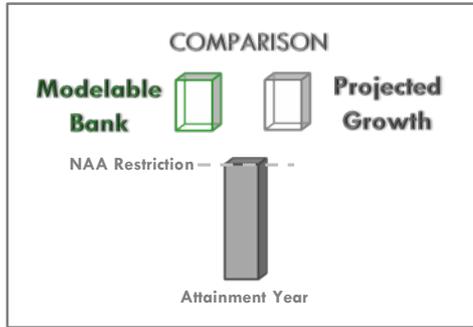
NO <sub>x</sub> MDERCs	
Certificate Number	Ton Amount
D3XXX	0.3
D3XXX	29.4
D3XXX	20.9
D3XXX	23.1
D3XXX	25
<b>Total NO<sub>x</sub> MDERCs</b>	<b>240.7</b>



Bank

Analysis

Model



## MODELABLE BANK EXAMPLE

### NO<sub>x</sub> DERCs

**1** Current Snapshot

34,380.3 tons NO<sub>x</sub> DERCs  
 240.7 tons NO<sub>x</sub> MDERCs

**2** Remove DERCs & MDERCs for MECT

**33,139.6 tons NO<sub>x</sub> DERCs**

DERCs & MDERCS for MECT Sources Compliance (30 TAC § 101.356)

$$0.00 \text{ tons} + \left( \frac{10,000 \text{ tons} - 0.00 \text{ tons}}{10} \right) + 240.7 \text{ tons} = 1,240.7 \text{ tons}$$

*Of the 10,000 DERC cap, all the DERC tons avail. at 1:1 ratio (means those gen after Jan 1, 2005)*     
 *The rest of the 10,000 DERC annual cap made up of DERCs at 10:1 (means gen before Jan 1, 2005)*     
 *MDERCS (which do not count towards 10,000 DERC annual cap)*

Remove DERCs & MDERCs for MECT

$$34,380.3 \text{ tons} - 1,240.7 \text{ tons} = 33,139.6 \text{ tons DERCs}$$





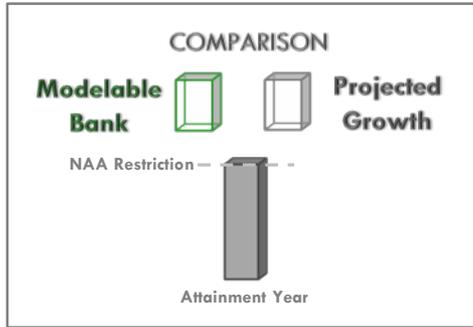
Bank



Analysis



Model



## MODELABLE BANK EXAMPLE

### NO<sub>x</sub> DERCs

**1** Current Snapshot      34,380.3 tons NO<sub>x</sub> DERCs  
    240.7 tons NO<sub>x</sub> MDERCs

**2** Remove DERCs & MDERCs for MECT      33,139.6 tons NO<sub>x</sub> DERCs

**3** Discount Offset Ratio      25,492.0 tpy NO<sub>x</sub> DERCs

**4** Convert tpy to tpd      **69.8 tpd NO<sub>x</sub> DERCs**

HGB Ozone Season is  
 365 days/year

$$\left( \frac{25,492.0 \text{ tons NO}_x}{\text{year}} \right) \left( \frac{1 \text{ year}}{365 \text{ days}} \right) = 69.8 \text{ tpd NO}_x$$



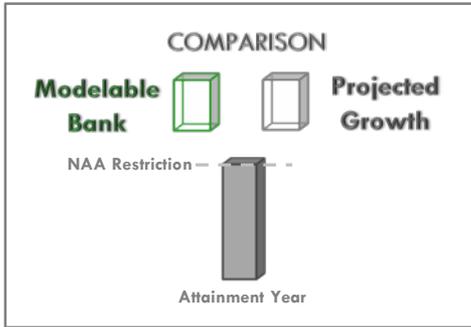
Bank



Analysis



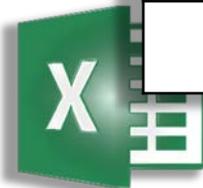
Model



## THE MODELABLE BANK SPREADSHEET

- ❖ The Modelable Bank for each area and pollutant is compared to the Projected Growth.
- ❖ The Modelable Bank Excel workbook will be available on the Air Modeling website following adoption of the HGB 2008 Ozone Attainment Demonstration (AD) State Implementation Plan (SIP) revision.

Modelable Bank for FY2017 HGB 2008 Ozone AD SIP revision <b>in progress</b>			
Pollutant	ERCs (tpd)	DERCs (tpd)	Total Modelable Bank (tpd)
NO <sub>x</sub>	0.6	69.8	<b>70.4</b>
VOC	1.8	3.9	<b>5.7</b>





Bank

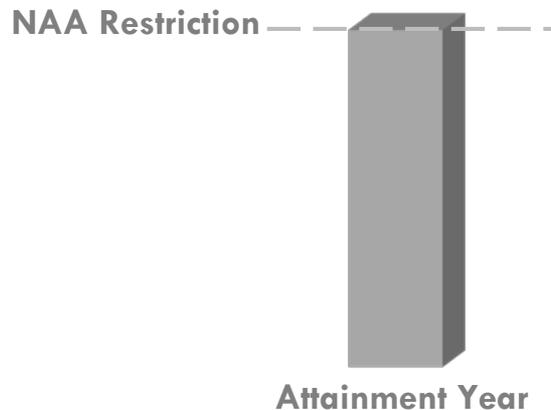
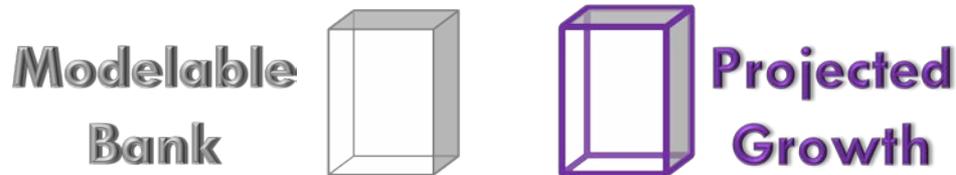


Analysis



Model

## THE ANALYSIS: A KEY COMPARISON



- ❖ Future Emissions of non-capped NAA sources are limited to the smaller of the Modelable Bank or Projected Growth.



# Modeling the Credit Registry



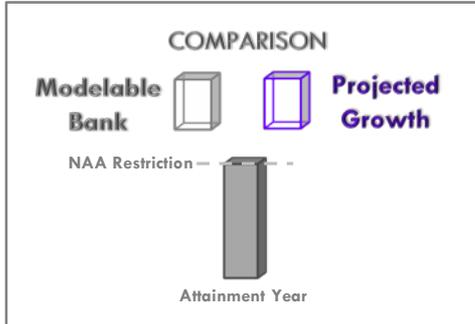
Bank



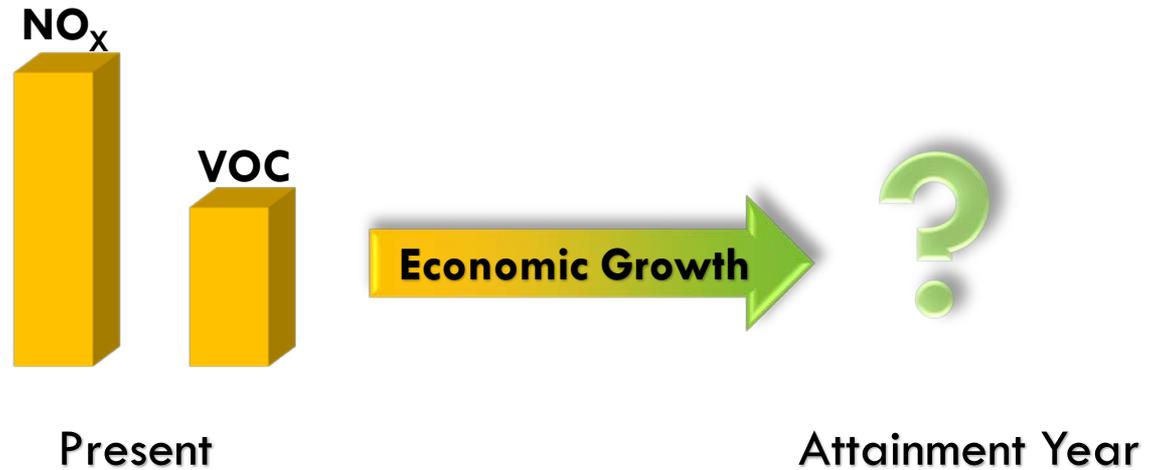
Analysis

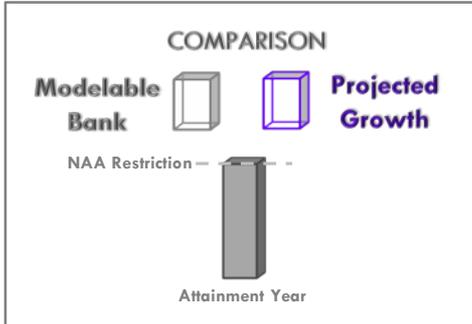


Model



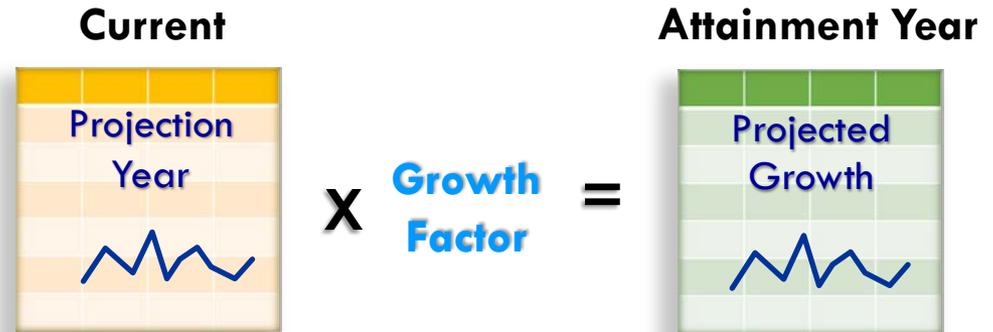
## DERIVING THE PROJECTED GROWTH





## PROJECTED GROWTH FROM GROWTH FACTORS

- ❖ Projected Growth is derived from Projection Base Year emissions with **Growth Factors**.
- ❖ Growth Factors are based on location and industry type.
- ❖ Growth factors can reflect positive or negative growth.





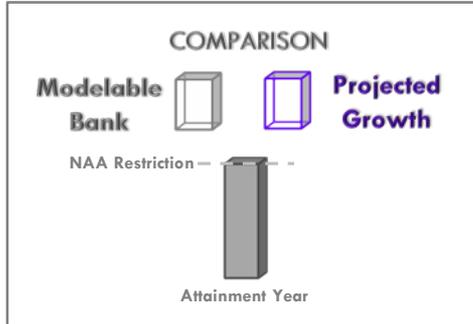
Bank



Analysis



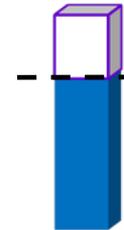
Model



## PROJECTED GROWTH EXAMPLES

Positive

$$\begin{array}{l} \text{Projection Base Year} \\ \text{NO}_x \\ \mathbf{1.2 \text{ tpd}} \\ \text{(tons per day)} \end{array} \times \begin{array}{l} \text{Growth} \\ \text{Factor} \\ \mathbf{0.14} \end{array} = \mathbf{0.17}$$



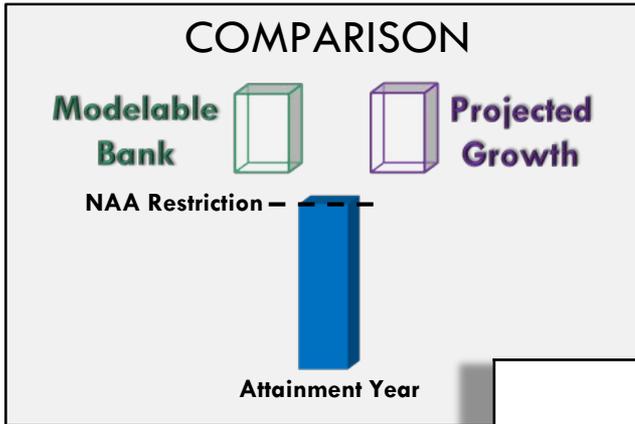
Credits are necessary to offset 0.17 tons of Projected Growth in Future Emissions.

Negative

$$\begin{array}{l} \text{Projection Base Year} \\ \text{NO}_x \\ \mathbf{1.2 \text{ tpd}} \end{array} \times \begin{array}{l} \text{Growth} \\ \text{Factor} \\ \mathbf{-0.14} \end{array} = \mathbf{-0.17}$$



No credits are necessary to offset Future Emissions.



## THE KEY COMPARISON FOR FUTURE EMISSIONS

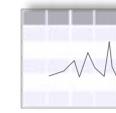
Area	Pollutant	Total Modelable Bank (tpd)	Total Projected Growth (tpd)	Limiting Attribute
HGB	NO <sub>x</sub>	70.4	1.51	Growth
HGB	VOC	5.7	11.12	Bank



- ❖ This side-by-side comparison reveals which constraint is anticipated to limit the growth of NAA non-capped point source emissions in the attainment year.



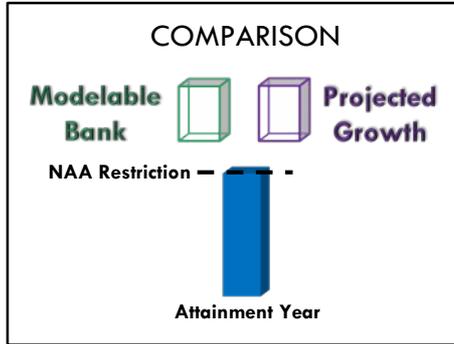
Bank



Analysis



Model



## FUTURE YEAR EMISSIONS IN THE MODEL

### SCENARIO 1 MODELABLE BANK-LIMITED

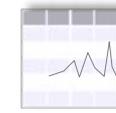
Future Emissions = Projection Year + Modelable Bank

### SCENARIO 2 PROJECTED GROWTH-LIMITED

Future Emissions = Projection Year + Projected Growth



Bank



Analysis



Model

## FUTURE YEAR EMISSIONS IN THE MODEL

Area	Pollutant	2014 Emissions (tpd)	Total Modelable Bank (tpd)	Total Projected Growth (tpd)	Limiting Attribute	Future Emissions in the Model (tpd)
DFW	NO <sub>x</sub>	20.45	14.7	- 0.26	Growth	20.45 – 0.26 = <b>20.19</b>
DFW	VOC	45.25	0.30	0.60	Bank	45.25 + 0.30 = <b>45.55</b>
HGB	NO <sub>x</sub>	18.99	70.4	1.51	Growth	18.99 + 1.51 = <b>20.55</b>
HGB	VOC	111.97	5.7	11.12	Bank	111.97 + 5.7 = <b>117.67</b>



## Summary: Modeling the Credit Registry Bank

- ❖ From an Attainment Modeling perspective, banked credits represent the potential growth of emissions of non-capped sources in nonattainment counties.
- ❖ The amount of modelable credits is determined based on the current available credits and accounting for any area- and program-specific rules.
- ❖ Future Emissions are shaped by whichever attribute is anticipated to be the limiting constraint: the Projected Growth or the Modelable Bank.



## QUESTIONS?

### Contact Information

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