Control Strategy Tool (CoST) User Training

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Goals of Training

- Show you how to use the Control Strategy Tool (CoST) to:
  - Review the control measure data available for various pollutants and source categories
  - Develop control strategies for various types of emissions inventories using different algorithms
  - Analyze the outputs from control strategies
- Demonstrate how to use features of the Emissions Modeling Framework (EMF) relevant to CoST

Origin & Purpose of CoST

- CoST was developed by the Air Economics Group of the HEID/OAQPS
- CoST will replaces AirControlNET
- Used primarily for NAAQS Regulatory Impact Analyses (RIAs)
  - Analyze tighter standard under consideration
  - Also analyze levels above and below
  - Use CoST to identify additional controls that could be applied by States and EPA to bring areas into attainment, and estimate costs

What does CoST do?

- Supports preparation and analysis of future year emission control strategies for point, area, and mobile sources

- Reports on the emissions reductions and costs associated with:
  - the target pollutant (e.g., PM2.5, NOx, or SO2 for PM2.5 NAAQS Analyses)
  - co-impacts of the selected measures on other pollutants (primarily criteria pollutants)

What questions are we trying to answer with CoST?

- Example Goal: reduce NOx emissions in 2020 for the Southeast by 100,000 tons/yr
- Use CoST to answer control questions for criteria air pollutants like:
  - What is the **maximum emissions reduction** achievable for NOx and what set of controls will achieve this reduction? (i.e., is my goal < maximum?)
  - What set of control measures can achieve the emissions reduction goal at the **least cost**?
  - What does the **cost curve** look like for other levels of reduction?

Questions CoST Can Answer (ctd.)

- What **emission reductions** for the target pollutant would be achieved?
- What are the emission reductions **or increases** for **other pollutants** of interest?
- What are the **engineering costs** of applying the controls for a specific strategy?
- What **control measures** are available for specific source categories and pollutants; how much reduction do they provide and for what cost?
- Future goal: What is the optimum method for achieving simultaneous reductions of **multiple pollutants** (e.g., PM and toxics)?

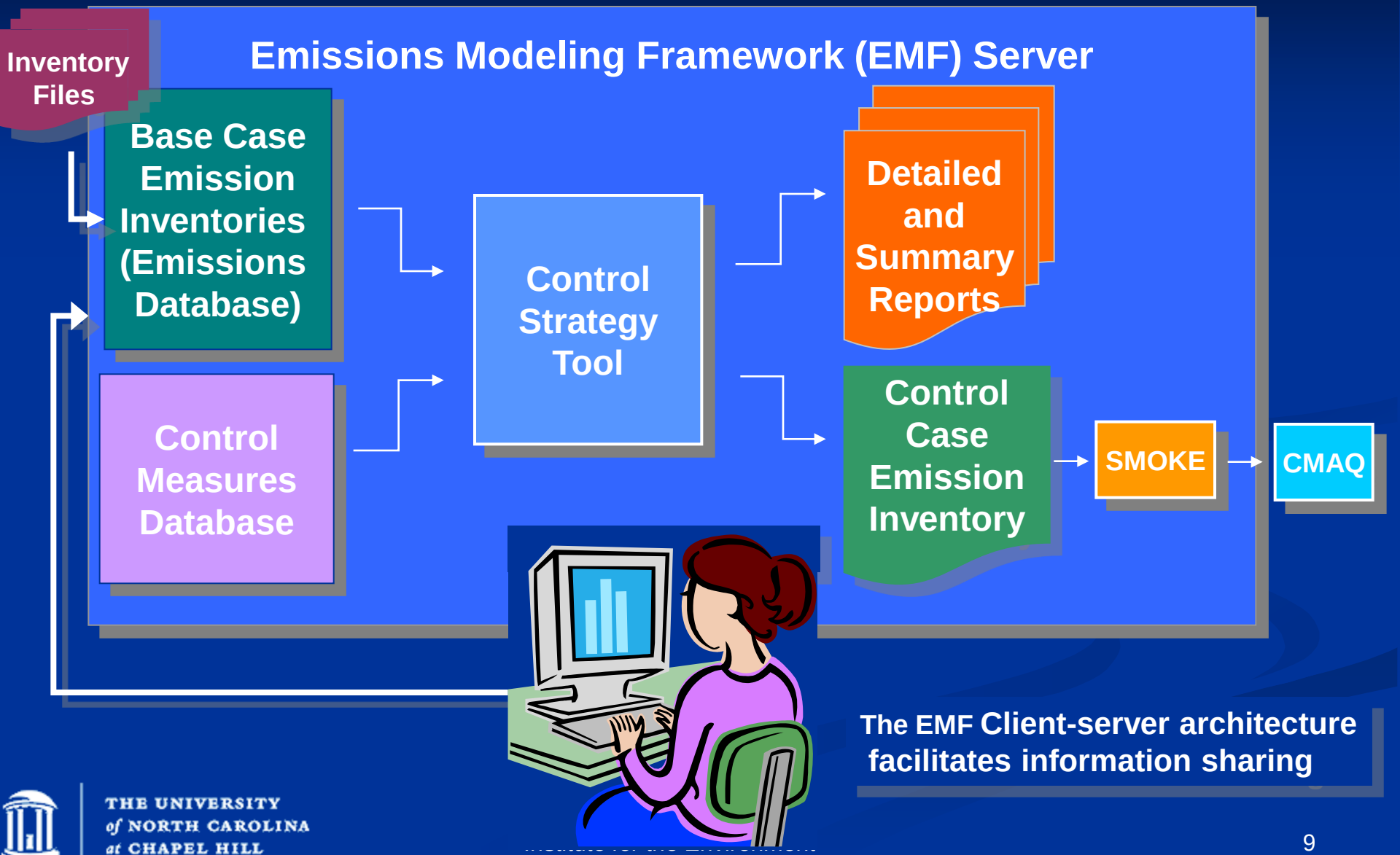
Control Strategies

- In CoST, Control Strategies are set up and run to help answer the questions posed above
- Running a control strategy causes control measures to be assigned to emissions sources via an algorithm (e.g., least cost)
- Estimates of the resulting emissions reductions (and/or increases) and costs are provided

CoST Control Measures Database

- The CMDB is the basis upon which answers to the questions can be developed
- Contains information about control measures, their control efficiencies, engineering costs, and the emission sources to which they apply
- Was initially populated with data from AirControlNET, but there are additions & updates
- Currently the CMDB has data for the main criteria pollutants (HAPs and GHGs may be better supported in the future)
- Control Efficiencies and costs can vary by pollutant, state and/or county, source size, and year

CoST is a Client-Server System



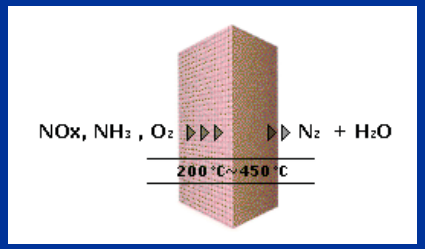
The EMF Client-server architecture facilitates information sharing

About Control Measures

- Encapsulate information about a technique that reduces emissions for some pollutant
- Cost and emissions reduction information can be specified for ***multiple*** *pollutants, years, states, and counties*
- If costs are specified for more than one pollutant, they are considered additive
- Costs can be negative (i.e., cost savings)
- Coimpacts of other pollutants that are either increases or decreases can be specified
- Measures can apply to one or more SCCs (BUT, if cost or efficiency differs for any of the SCCs, those must be defined as separate measures – this results in multiple measures for the same control technology (e.g., heavy duty vs. light duty)

Example Control Measure Application

Industrial Boiler

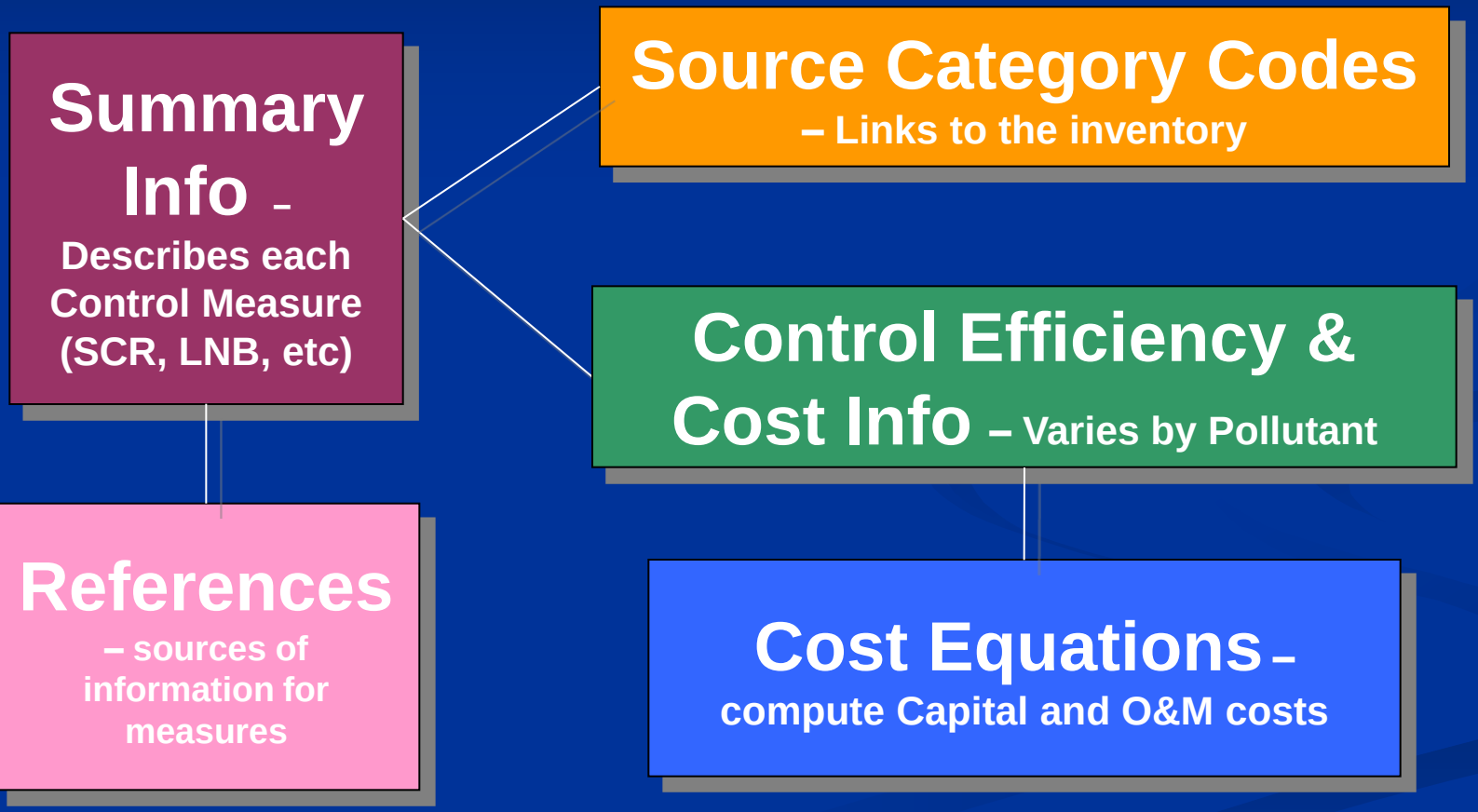


SCR

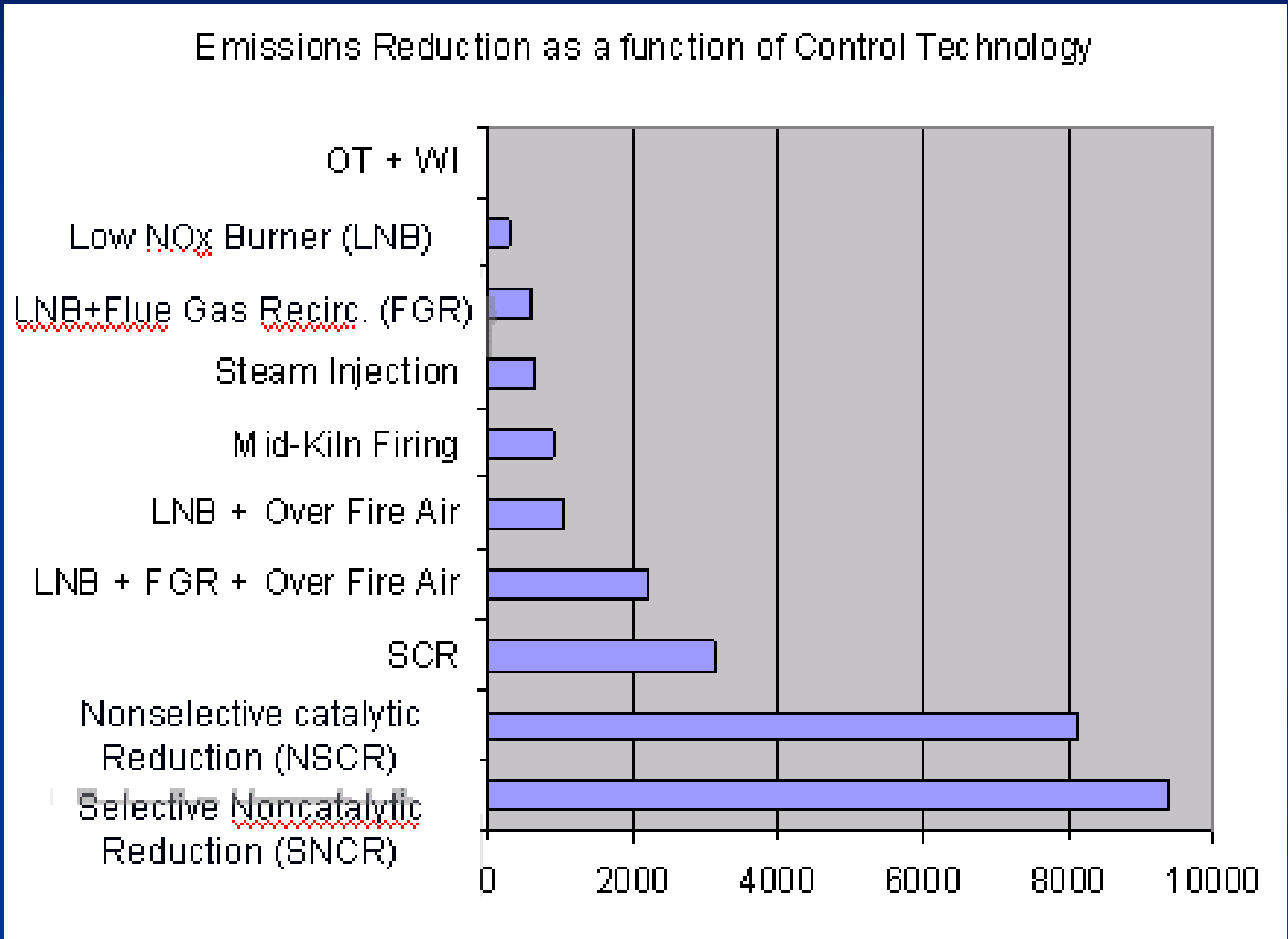
Plant:	International Paper
Industry:	Pulp & Paper Mill
SCC:	Indust. Boiler - Bit/Subbit Pulv Coal Dry Bottom
Pollutant:	NOx (177 tons/yr)
Control:	Selective Catalytic Redxn
CE:	75%
CPTon:	$1,319
Reduction:	133 tons/yr
Final Emis:	44 tons/yr
Cost:	$175,000

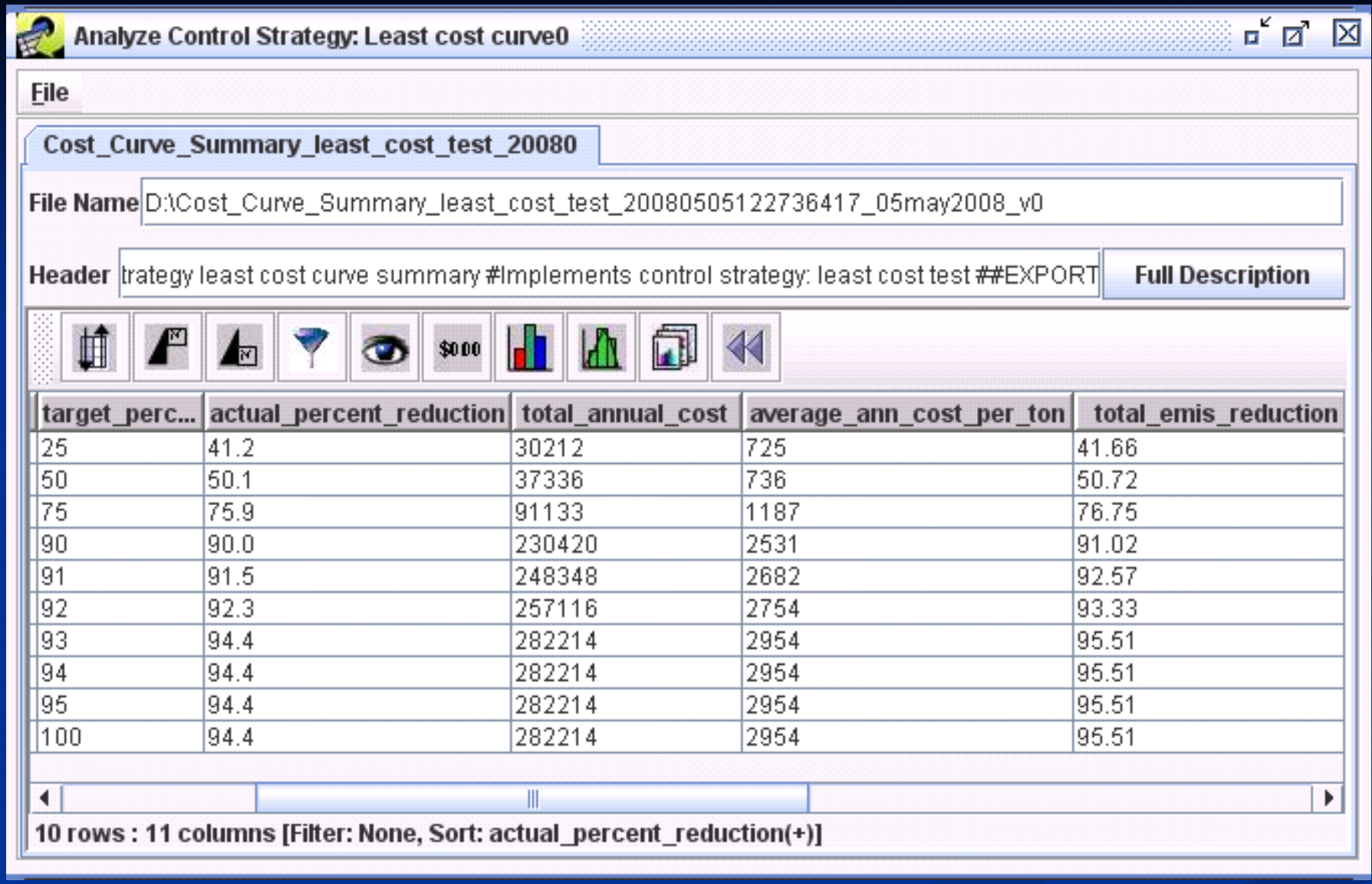
Data Stored for each Control Measure

Control Measure: A technology or program that reduces emissions
The CMDB: A set of related tables of control measure data



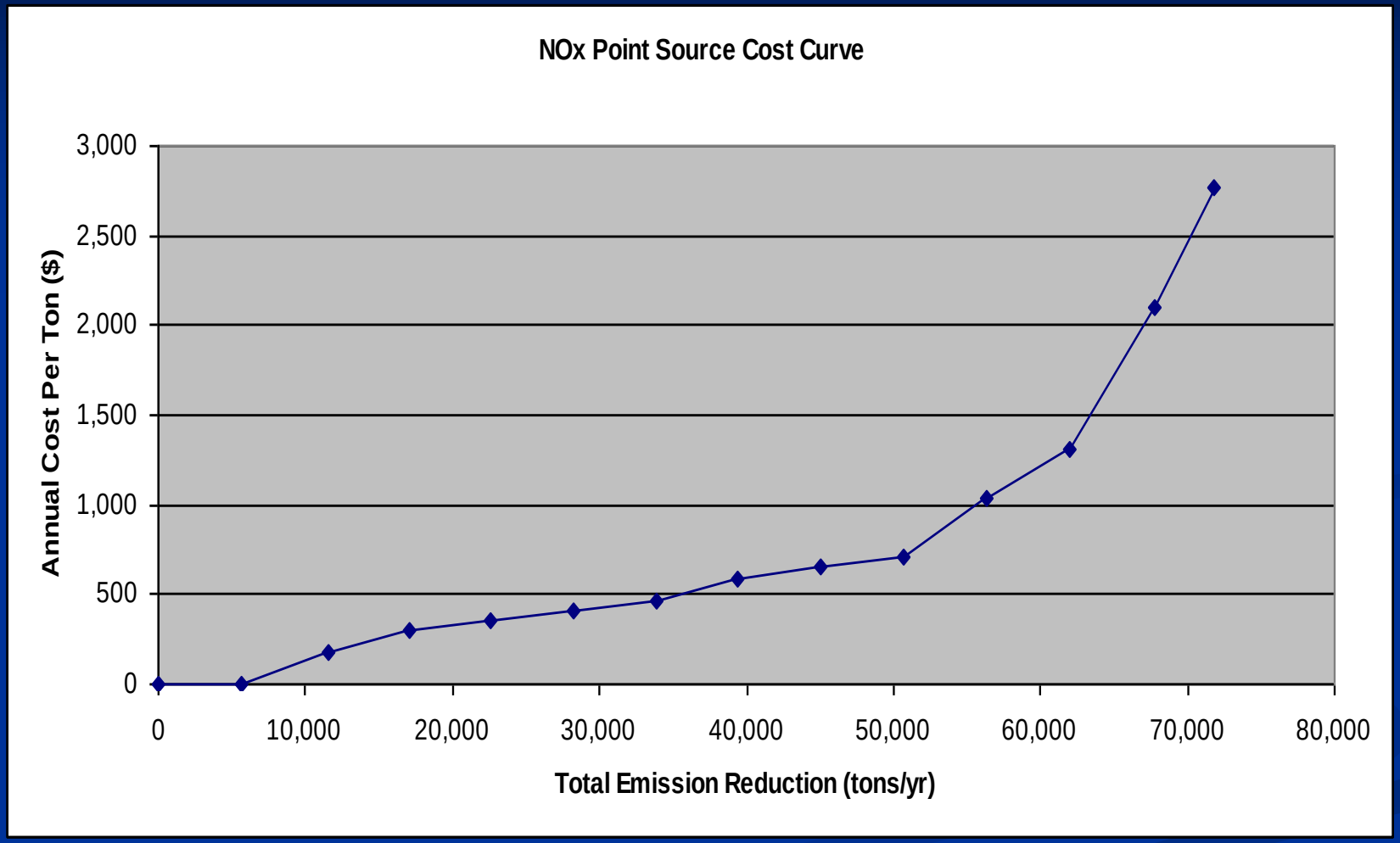
Example of Plot based on Summary of an Output by Control Technology





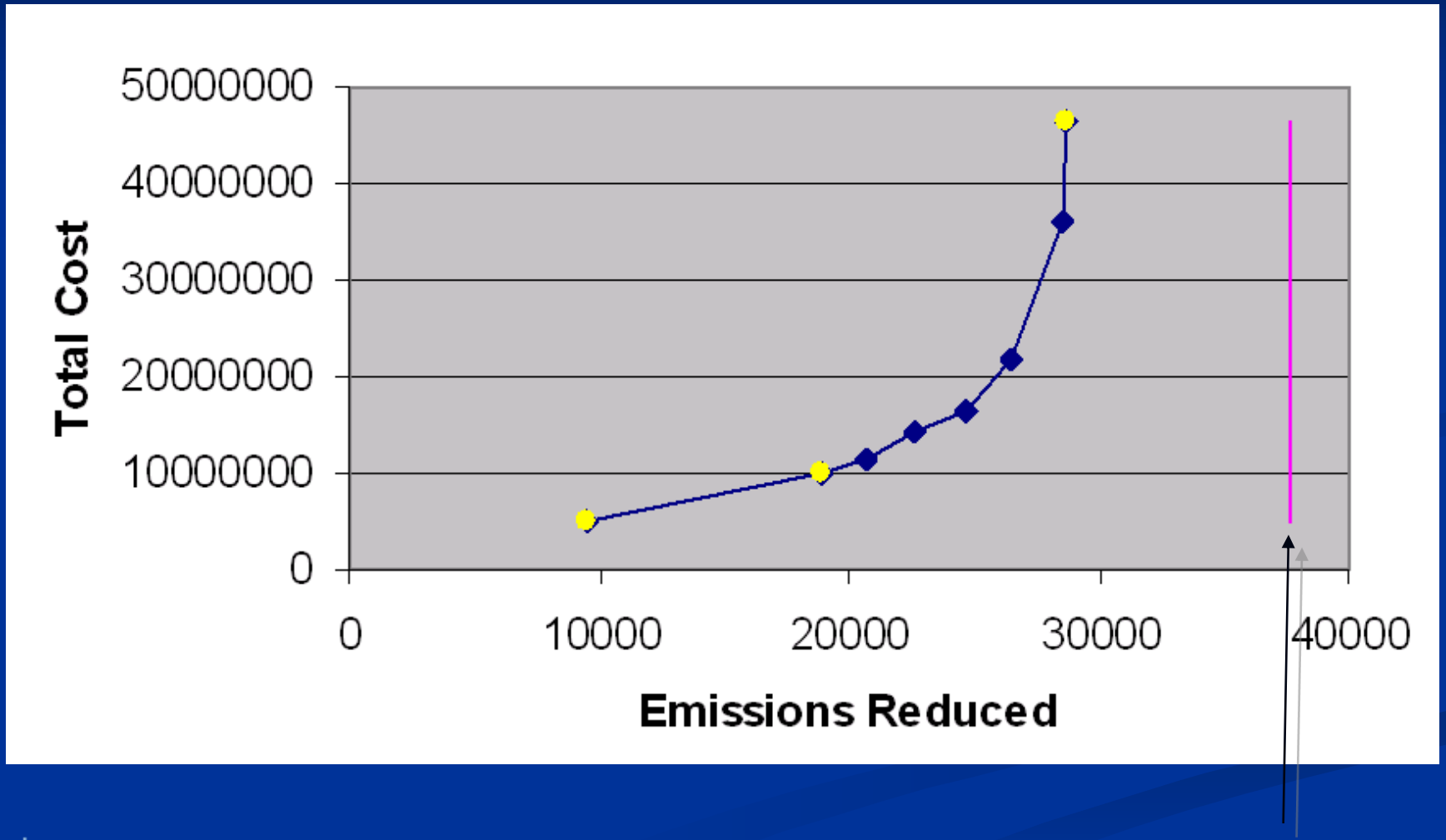
- Cost curve summary shows results for all least cost runs performed (NOx in this case)

CoST per Ton Cost Curve

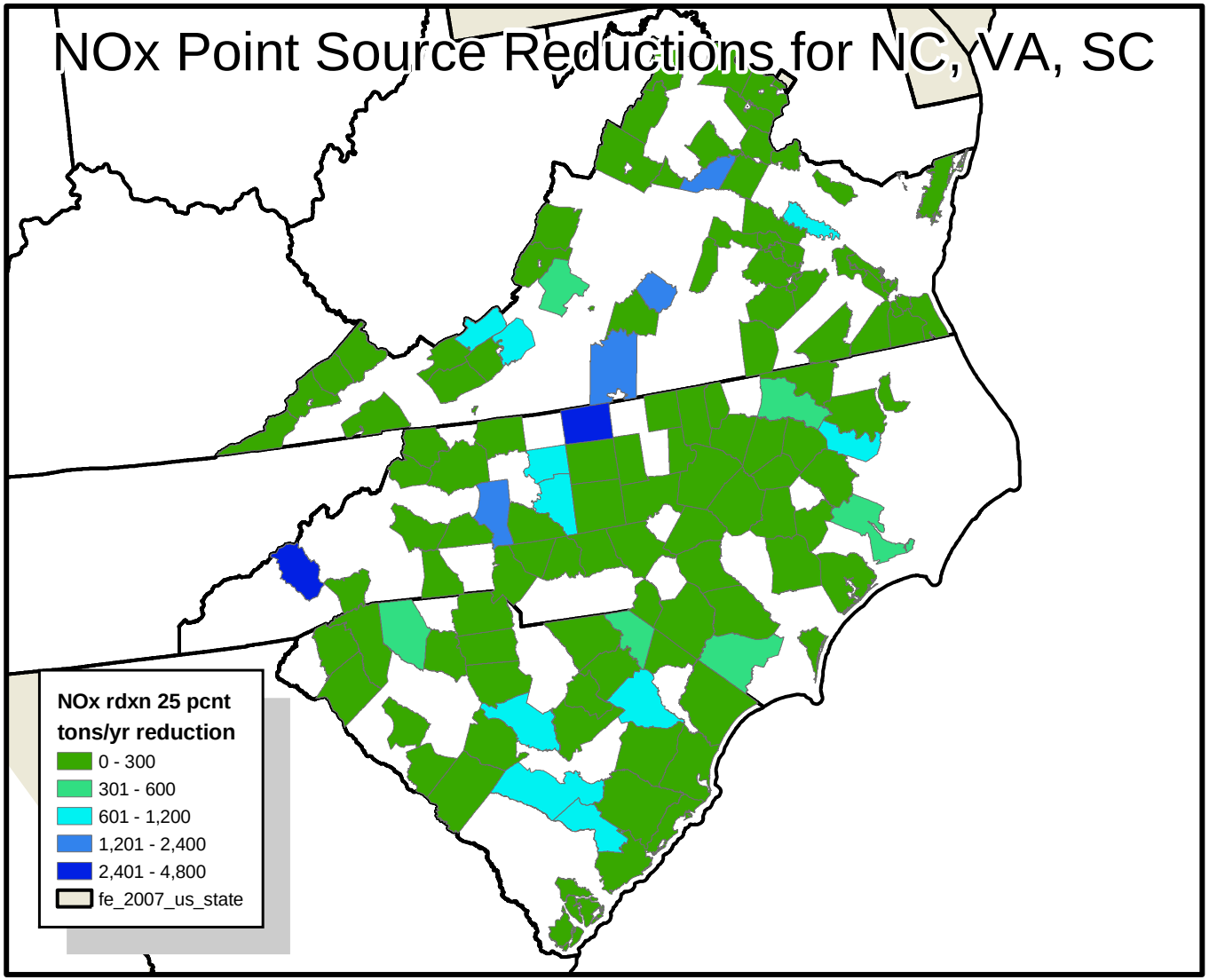


*** Data generated by CoST, but plotted with Excel**

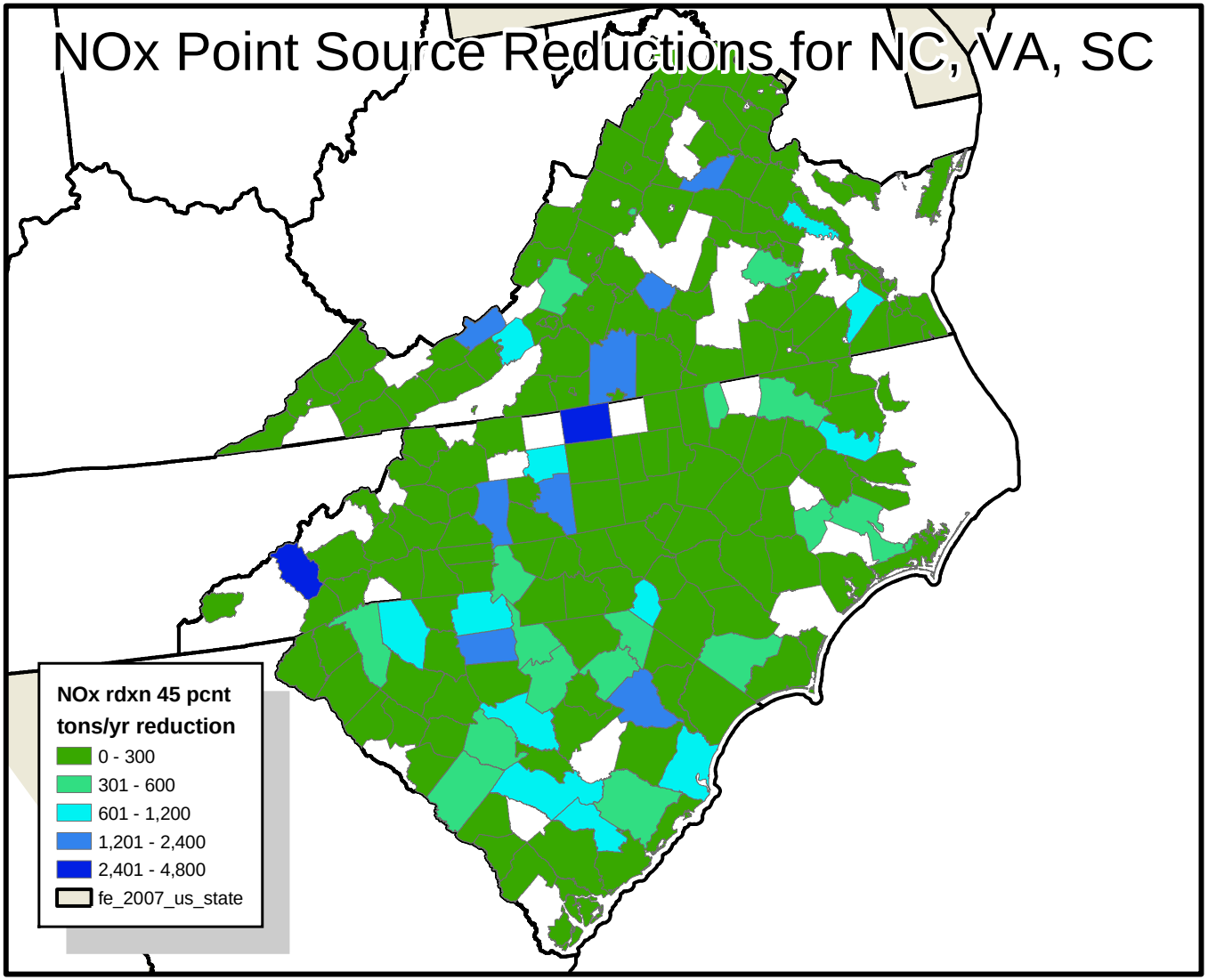
Example Cost Curve of Total Cost as f(Emissions Reduced)



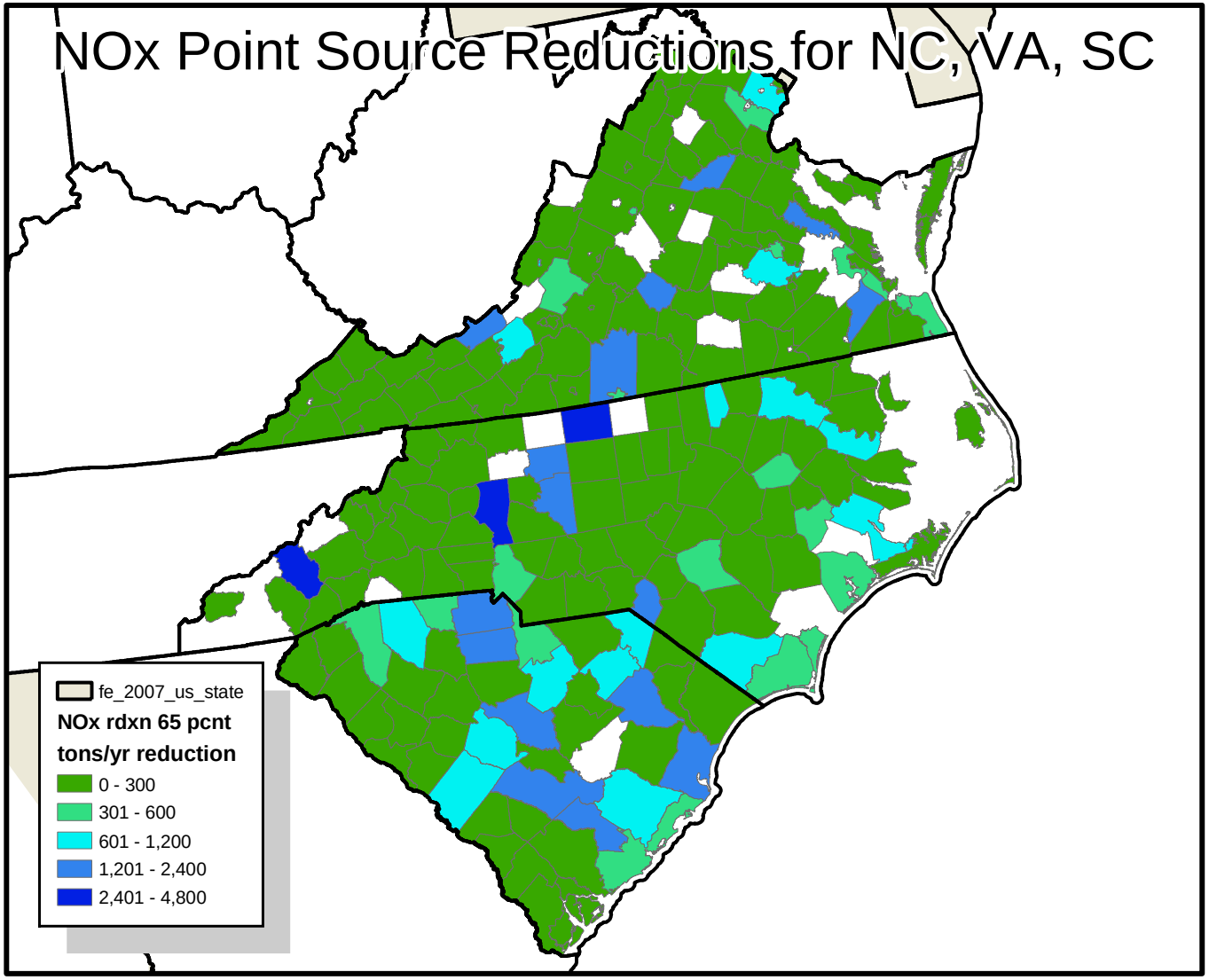
CoST Outputs: 25% Reduction

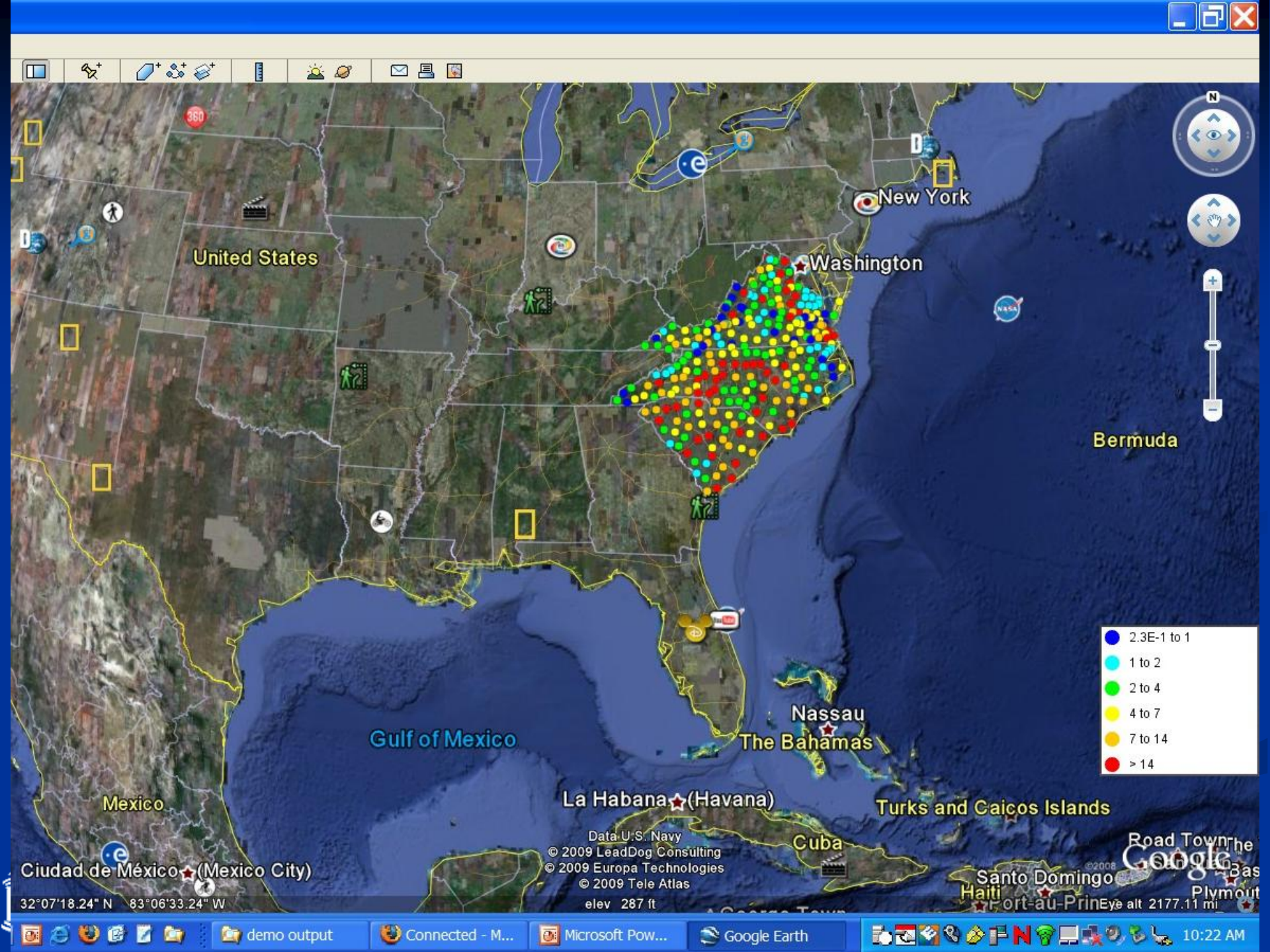


CoST Outputs: 45% Reduction



CoST Outputs: 65% Reduction

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La Habana (Havana)
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Cuba
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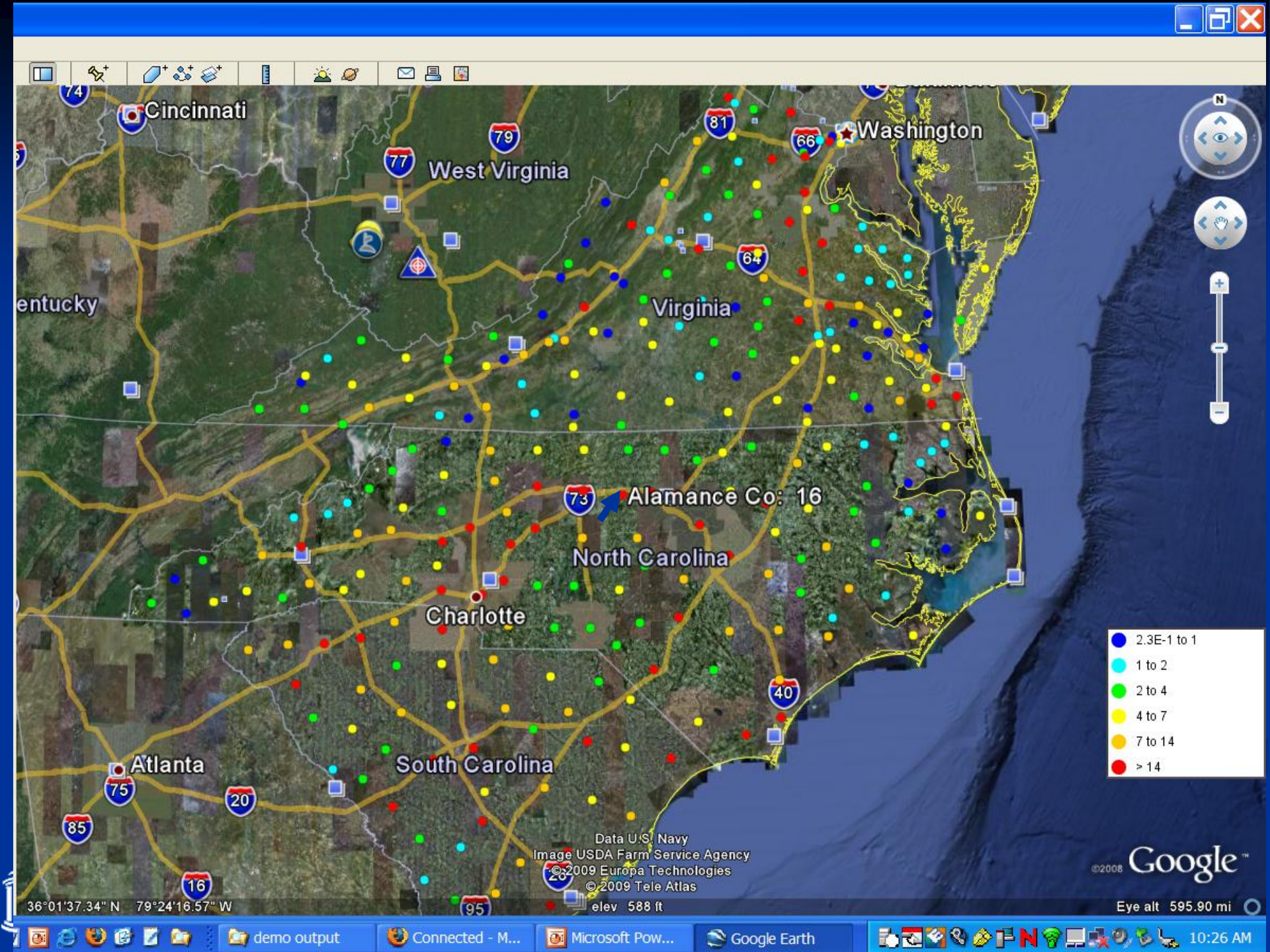
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©2009 Europa Technologies
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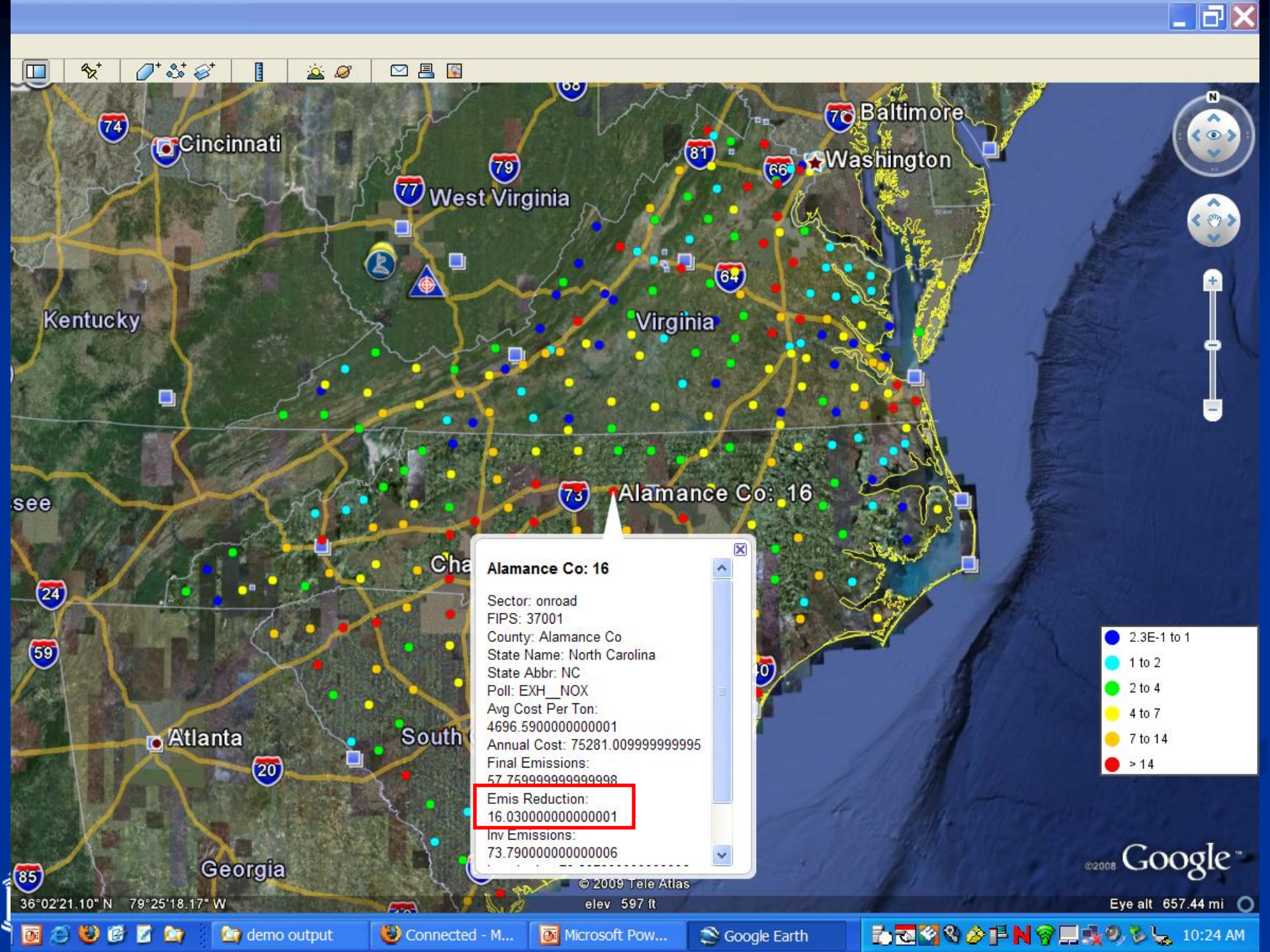
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Key Steps for Running a Control Strategy

1) Input Basic Parameters (e.g.):
- Name
- Cost Year for results
- Target Pollutant

2) Select Strategy Algorithm (e.g.):
- Max Emissions Reduction
- Least Cost
- Least Cost Curve

3) Select Inventory Dataset(s):
- Sectors (EGUs, point, area, mobile)
- Filters for specific SCCs, geographic areas, etc.

4) Select Control Measures:
- Default is to include known measures
- Can select certain technologies

5) Select Constraints (e.g.):
- Max cost/ton controls (e.g., $20K/ton)
- Min emissions reduction (e.g., 10 tpy)

6) Run Strategy Query

Outputs:

- **Detailed Pairing of Measures to Sources**
- **Control Case Emissions Inventory**
- **Summaries (Automatic and On-Demand)**

Control Strategy Hands-on Exercises