



Air Pollution Issues In Tennessee

Presented To:

CAPCA Spring Meeting

April 12, 2007

Presentation Outline

- Current Air Quality Measurements
 - Ozone
 - PM_{2.5}
- SIP Development
 - Ozone
 - PM_{2.5}
 - Regional Haze

Outline - Continued

- TDEC Challenges
 - Initiatives Underway
 - GSMNP Mercury Assessment
 - Tennessee Diesel Working Group
 - Alternate Fuels

Air Monitoring Sites In Tennessee

2006 Air Monitoring Sites

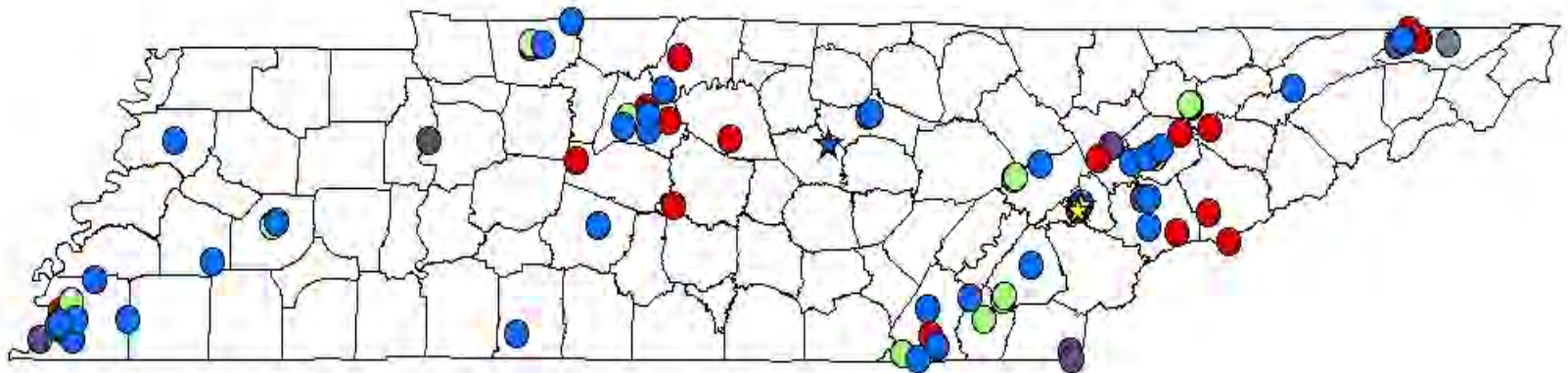
Pollutant

- CO
- Lead
- NO₂
- O₃
- PM₁₀
- PM_{2.5}
- SO₂

Other 2006 Sites

Pollutant

- ★ Acid Rain
- ★ Air Toxics



Tennessee Preliminary Ozone Data for 2006

County	Site Name	MONITOR ID	2006 4th Max.	2003 2005 DV> 0.08 PPM	2004 2006 DV> 0.08 PPM	2006 4th Max Needed for 8 Hr DV Violation
Anderson Co	Freels Bend_Study Area Melton Lake	470010101 - 1	0.08	0.076	0.076	0.105
Blount Co	Great Smoky Mountains Np Look Rock	470090101 - 1	0.085	0.086	0.084	0.087
Blount Co	Great Smoky Mountains Np - Cades Cove	470090102 - 1	0.071	0.067	0.067	0.123
Davidson Co	1015 Trinity Lane	470370011 - 1	0.072	0.066	0.068	0.121
Davidson Co	Percy Priest	470370026 - 1	0.079	0.076	0.078	0.1
Hamilton Co	Volunteer Army Ammunition Plant	470654003 - 1	0.085	0.079	0.080	0.1
Hamilton Co	Ridgetrail Rd.	470651011 - 1	0.088	0.077	0.080	0.102
Jefferson Co	1188 Lost Creek Rd	470890002 - 1	0.083	0.082	0.081	0.093
Knox Co	9315 Rutledge Pike Mascot Tn 37806	470930021 - 1	0.077	0.079	0.076	0.102
Knox Co	4625 Mildred Drive	470931020 - 1	0.086	0.084	0.083	0.091
Meigs Co	8401 Highway 60	471210104 - 1	0.08	0.080	0.079	0.097
Rutherford Co	Eagleville Puckett'S Farm	471490101 - 1	0.074	0.075	0.074	0.106
Sevier Co	Great Smoky Mountain Np Cove Mountain	471550101 - 1	0.080	0.078	0.077	0.102
Sevier Co	Clingsmans Dome, Great Smoky Mtns. Np	471550102 - 1	0.086	0.079	0.080	0.101
Shelby Co	1330 Frayser Blvd 6855 Mudville Rd.	471570021 - 1	0.083	0.079	0.079	0.1
Shelby Co	Edmond Orgill Park	471571004 - 1	0.084	0.081	0.080	0.099
Sullivan Co	Hill Road	471632002 - 1	0.081	0.079	0.079	0.098
Sullivan Co	Ketron Middle School On Bloomingdale Rd.	471632003 - 1	0.083	0.078	0.079	0.1
Sumner Co	Rockland Recreation Area-Old Hickory Dam	471650007 - 1	0.088	0.082	0.083	0.094
Sumner Co	Cottontown Wright's Farm	471650101 - 1	0.083	0.076	0.079	0.101
Williamson Co	Fairview Middle School Crow Cut Road	471870106 - 1	0.072	0.076	0.073	0.107
Wilson Co	Cedars Of Lebanon State Park	471890103 - 1	0.08	0.077	0.077	0.103
Christian	Hopkinsville	210470006 - 1	0.077	0.077	0.076	0.103
DeSoto	5 East South	280330002 - 1	0.087	0.080	0.083	0.091
Crittenden	Marion	050350005 - 1	0.089	0.086	0.087	0.081
Shelby Co	Alabama	471570024	0.072			

A new 24
hour PM_{2.5}
standard
Data Table for
FRM Monitoring
Sites →
Designations
made on future
data!

County	AIRS #	2003 - 2005 Annual PM 2.5 DV (15 ug/m3)	2003 - 2005 Updated 24 Hr 98%tile DV (35 ug/m3)
Blount	470090011	14.1	33
Davidson	470370023*	13.9	33
	470370025		
	470370036		
Dyer	470450004	12.2	30
Hamilton	470650031	16.1	35
	470651011	13.8	31
	470654002	15.0	34
Knox	470930028	14.5	33
	470931017	15.6	34
	470931020	15.1	32
Lawrence	470990002	11.5	27
Loudon	471050108	15.7	33
McMinn	471071002	14.1	32
Madison	471130006	9.2	20
Maury	471192007	13.0	31
Montgomery	471251009	13.9	35
	471251010**	15.1	35
Putnam	471410001	13.4	33
Roane	471450004	14.2	30
Shelby	471570014	13.8	33
	471570038	13.5	33
	471570047	13.8	34
	471571004	12.1	30
Sullivan	471631007	14.0	31
Sumner	471650007	13.9	33

*POC2 Used for 2003 Annual Avg.

**Only part of 1year available.

 Spatial Avg.
 3 Year DV >= Std.

8 Hour Ozone SIP Development

- Early Action Compacts
- Redesignation request for the Greater Knoxville Area
- Possible Bump Up of Memphis MSA

Early Action Compacts

- The Nashville, Chattanooga & Tri-Cities EACs are measuring attainment based on their 2004-2006 design values.
- EACs are conditional, federally approved 8-hour ozone SIPs that are incrementally extended by EPA based upon progress being made at certain milestones.
- The three Tennessee EACs have met all their milestones and are now in the last leg of the process.

Early Action Compacts

- The EACs defer the effective date of a nonattainment designation provided among other things that the 2005-2007 design value measures attainment.
- A decision has been made for all three areas to stay with the EAC through 2007 rather than going early for redesignation to attainment

8-hour Ozone Redesignation Request for the Greater Knoxville Area

- All monitors in the Greater Knoxville Area measure attainment of the 8-hour ozone standard for the 2004-2006 DV
- A decision has been made to submit a formal redesignation package to EPA asking that it be redesignated to attainment.

8-hour Ozone Redesignation Request for the Greater Knoxville Area

- 2007 will be a critical year for the area
 - 2004 was a favorable year for meteorology that would minimize the formation of ozone – it drops off.
 - The redesignation package makes a demonstration that improved air quality in the area was the result of strong, local control measures - not just the weather.
 - Two monitors in the area are “on the edge”, but measure attainment. Depending on what happens in 2007, these two monitors might measure a 2005-2007 DV in excess of the standard

8-hour Ozone Redesignation Request for the Greater Knoxville Area

- So... what's up with the two monitors?
 - **Look Rock Monitor in Blount County**
 - 2004-2006 DV is 84 ppb – 85 ppb is over the line
 - With 2004 dropping out of the calculation, the 2007 4th max need only be 84 ppb to go to an 85 ppb DV
 - The 2006 4th max for this site was 85 ppb
 - **Mildred Drive in Knox County**
 - 2004-2006 DV is 83 ppb – 85 ppb is over the line
 - With 2004 dropping out of the calculation, the 2007 4th max need only be 83 ppb to go to an 85 ppb DV
 - The 2006 4th max for this site was 86 ppb

8-hour Ozone Redesignation Request for the Greater Knoxville Area

- With these two monitors so close to the edge, why proceed with a request to reclassify the area to attainment?
 - Because you can
 - Once the area is redesignated to attainment, if it later measures nonattainment, all that is required is the implementation of contingency measures. The area remains attainment without the negative growth restrictions that are imposed in nonattainment areas.
 - TCA § 68-201-103 → Intent of the TN Air Quality Act

Contingency Measures Are Required If The Area Should Revert To Nonattainment

- Measures must be credible in the eyes of EPA
- May list a menu of additional measures with the commitment to choose part or all of those measures later, if needed



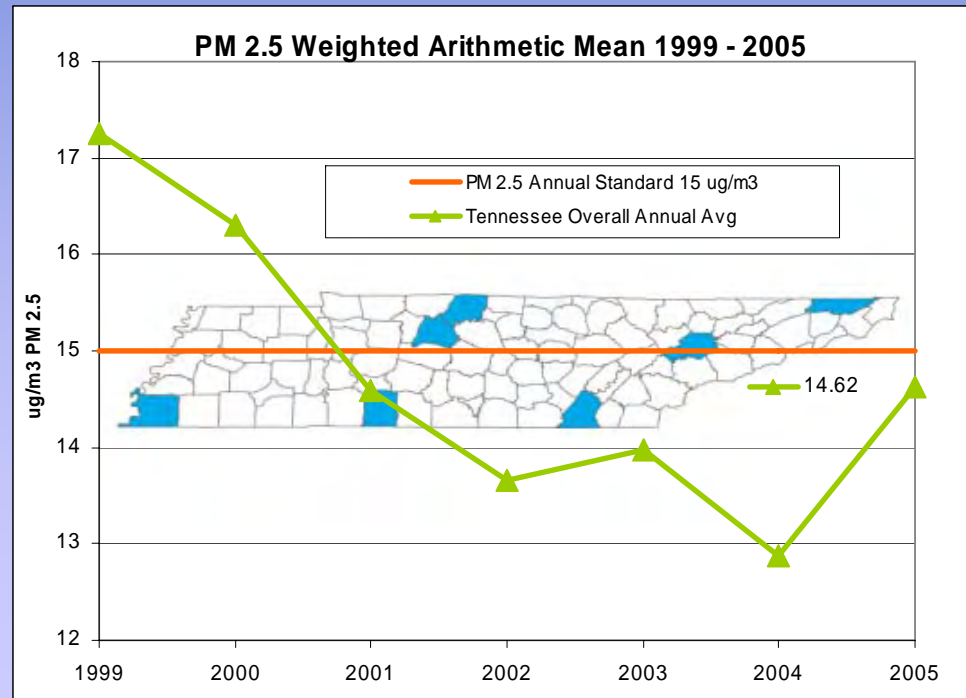
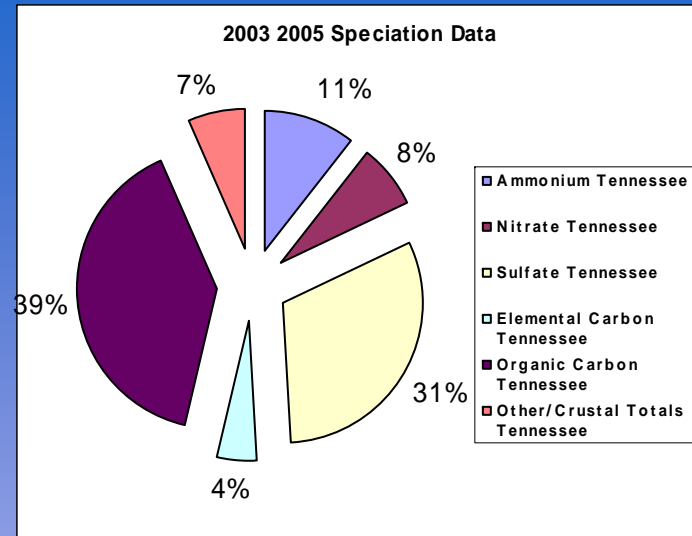
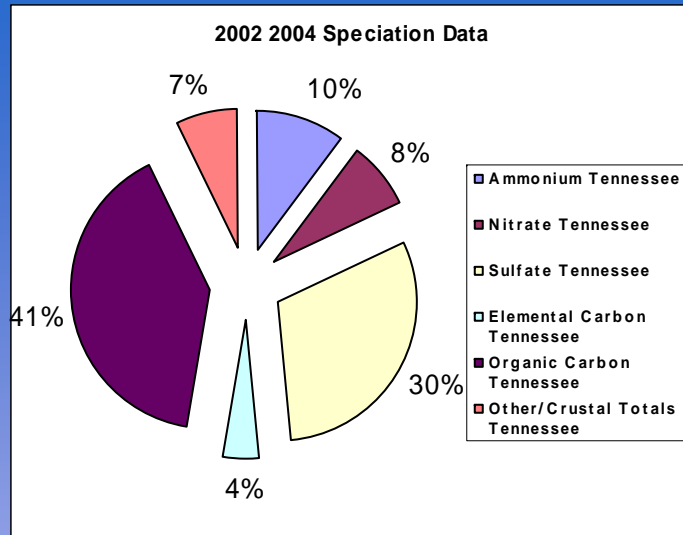
A “Bump Up” for Memphis?

- As a Subpart II Marginal nonattainment area, Memphis has a deadline to attain of June 15, 2007. It did not measure attainment based on the 2004-2006 data set, nor does it qualify for a one-year attainment deadline extension.
- Memphis may ask for a “bump up” back to Subpart II Moderate. If not, EPA is likely do it later. That will trigger several statutory measures.

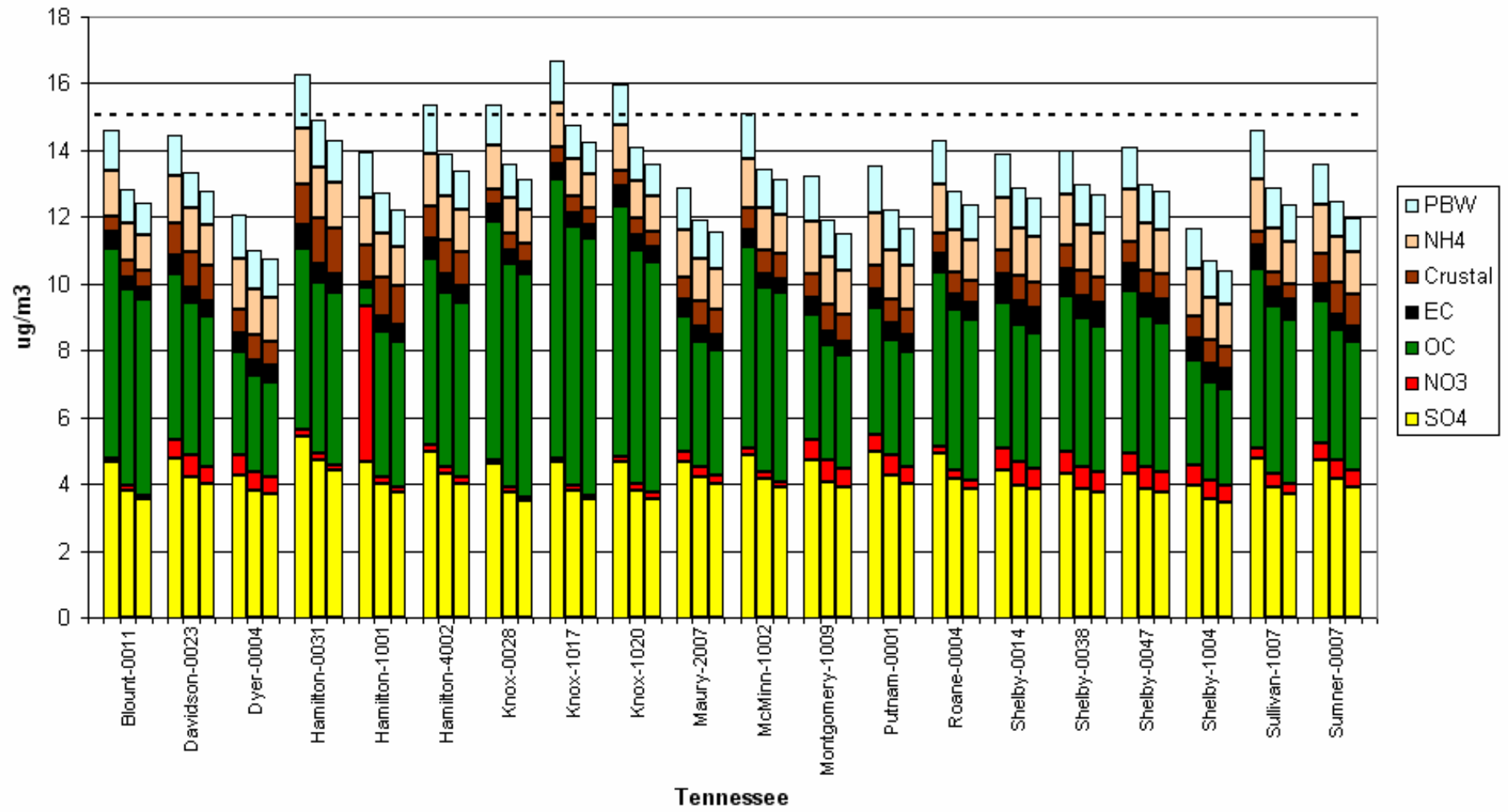
PM_{2.5} SIP Development

SIP Due April 5, 2008

Tennessee PM_{2.5} Overall Trends



**Tennessee 2002 Design Value (Left) and
2009 base f4a 12km projected DVF (Middle) and
2009 base G 12km projected DVF (Right)**



Tennessee PM_{2.5} Nonattainment Status

State	Nonattainment Area Name	Counties
Tennessee	Chattanooga, TN-GA	Hamilton
	Knoxville, TN	Anderson
		Blount
		Knox
		Loudon
		Roane (partial)

Path To PM_{2.5} Attainment

Date	Action
April 5, 2005	Nonattainment Designations Are Effective
Early 2007	EPA Should Have The PM _{2.5} Implementation Rule Finalized
April 5, 2008	PM _{2.5} State Implementation Plans Are Due
Up to April 2010 with extension to 2015 possible	Attainment Dates For Nonattainment Areas (Based Upon Previous 3 Years of Monitoring Data)

Regional Haze SIP Development

Due December 17, 2007

Regional Haze SIP Development

- Calculate Current Conditions
- Calculate Natural, Pre-Americanization Conditions (baseline conditions)
- Draw “Glide Path” Current year to 2064
- ID & Improve 20% Worst Days
- ID & Protect 20% Best Days
- Implement BART
- Evaluate Reasonable Measures
- Set Reasonable Progress Goals

BART Process

- Determine BART-Eligible sources (12)
- VISTAS exemption modeling (6)
- Remaining sources
 - Two (2) have conducted refined (4 km) exemption modeling
 - Two (2) have submitted BART analyses
 - Still waiting for last two (2)
- Draft a BART Rule

Reasonable Progress and the Four Statutory Factors

- We are required by the Regional Haze Rule to address these four factors:
 - 1) Cost of compliance
 - 2) Time necessary for compliance
 - 3) Energy and non-air impacts
 - 4) Remaining useful life of the source
- We are drafting letters to sources within the area of influence around the Great Smoky Mountains National Park
- Plan to evaluate the four factors for each source to determine if additional controls are reasonable

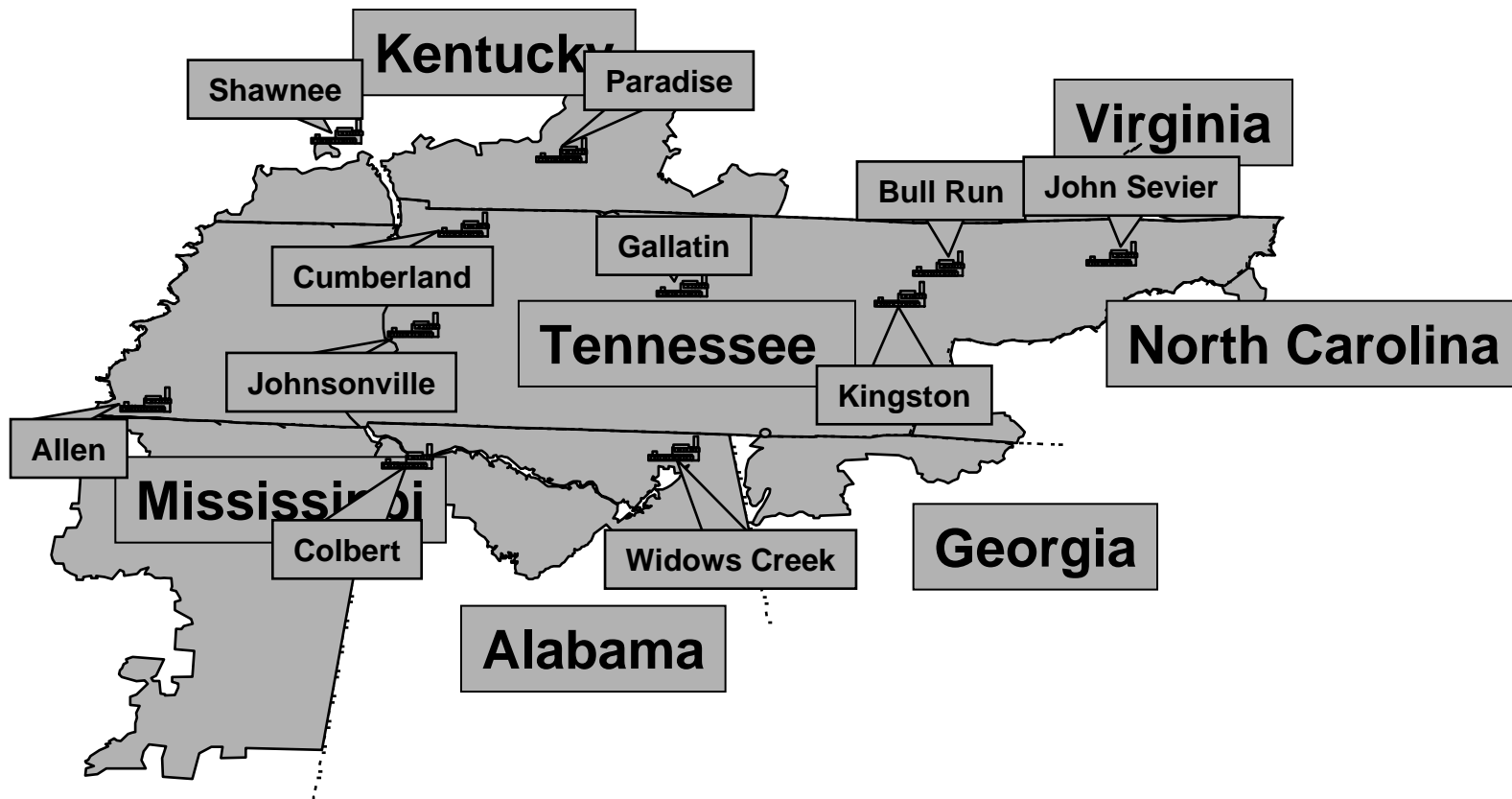
Consultation

- Tennessee is currently consulting with VISTAS states
 - North Carolina
 - Georgia
 - Alabama
- Tennessee is also consulting with non-VISTAS states
 - MANE-VU RPO
 - New Jersey, Maine
 - CENRAP RPO
 - Arkansas, Missouri

TVA's Control of SO₂ and NO_x

TVA Scrubber Program Schedule

Project	Calendar Year											
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	
Paradise Unit 3	█											
Bull Run			█									
Kingston Units 6-9				█								
Kingston Units 1-5					█							
John Sevier Units 1-2						█						
John Sevier Units 3-4							█					




TVA Bull Run Scrubber Construction Status

- Engineering approximately 90 percent complete
- Construction approximately 30 percent complete
- Absorber erection in progress
- Operational by January 1, 2009

**TVA Bull Run scrubber
absorber**





**Bull Run Scrubber
Electrical Building**

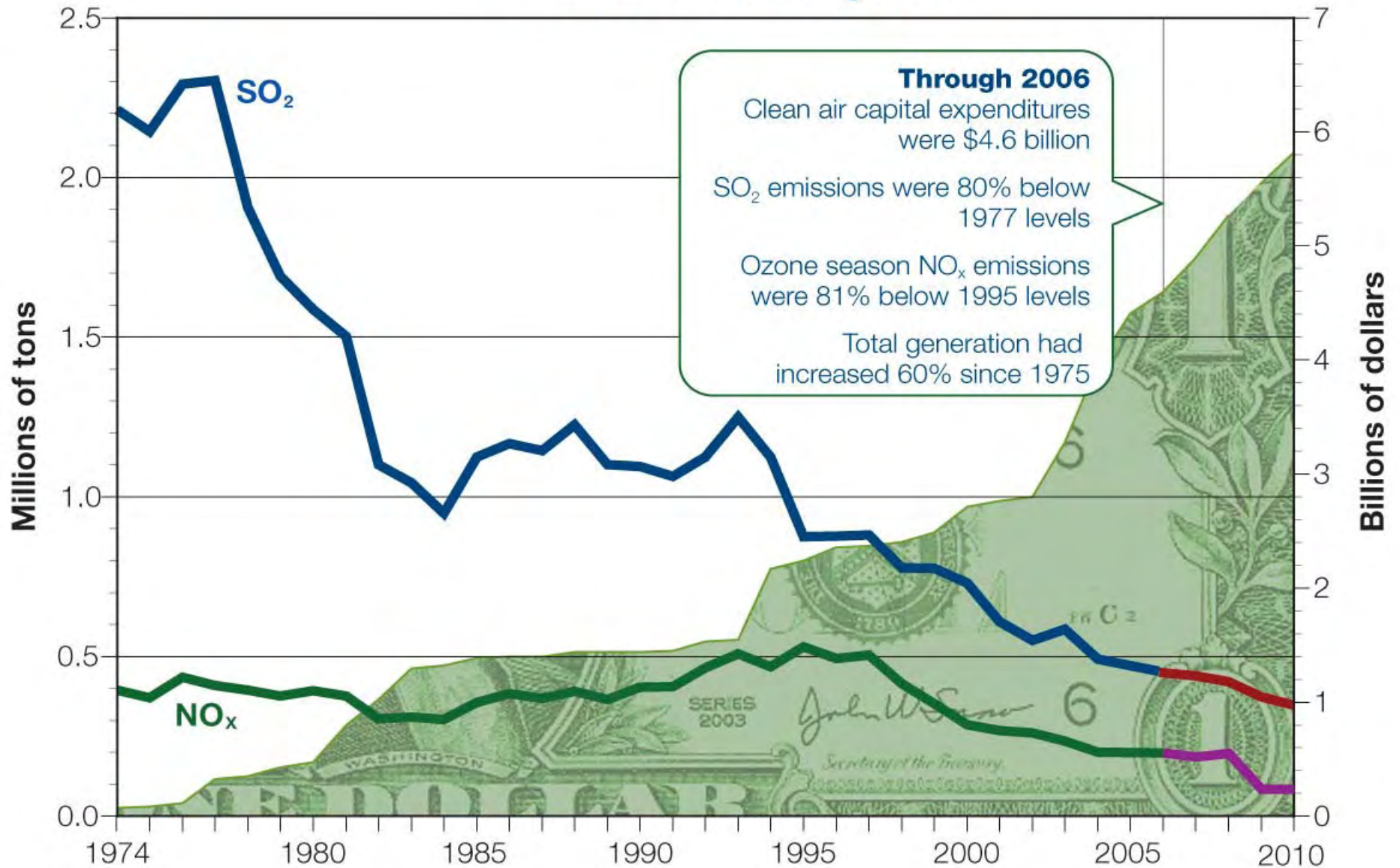
Kingston Scrubber

- Engineering approximately 45 percent complete
- Construction approximately 10 percent complete
 - **Drilled Piers complete**
 - **Absorber and Stack Foundations complete**
 - **Stack contractor mobilized**
- Units 6-9 operational by January 1, 2010
- Units 1-5 operational in January 1, 2011

**Kingston
Scrubber
Construction**



TVA's Clean Air Progress



Initiatives In Progress Or Under Development

Atmospheric Deposition of Mercury

- Are there “hot spots” of atmospherically deposited mercury in Tennessee?
- Does Tennessee need to be more restrictive on its sources subject to CAMR than the federal rules require?

Mercury

- Mercury deposition is measured as wet deposition or dry deposition
- Mercury exists as elemental mercury, reactive gas (oxidized) mercury and methylmercury in the environment
- From a human health exposure perspective, we are most concerned about methylmercury

Mercury, CAMR, and Tennessee

- Tennessee and other states are subject to a federal requirement under EPA's Clean Air Mercury Rule (CAMR)
- The state must either adopt CAMR, or be more restrictive.
- In deciding what the state should do about CAMR, we relied upon 3 factors and chose to adopt the federal CAMR cap and trade system.

Factors relied upon in adopting CAMR in Tennessee

- EPA modeling predicted that CAMR would address “hot spot” mercury issues in the nation.
- There were no known atmospherically deposited mercury “hot spots” in Tennessee.
 - TDEC-WPC
 - TVA
 - NPS
- Based upon a TDEC and TVA analysis, the state would be an exporter of excess mercury control credits rather than an importer of those credits.

Mercury – A Unique Study Opportunity

- As shown in the earlier slides on TVA's air pollution control efforts, significant reductions of SO₂ will occur in the next three years because of the installation of scrubbers (FGD) at Bull Run and Kingston.
- Bull Run and Kingston are currently equipped with selective catalytic reduction units (SCR) to control NO_x.

Mercury – A Unique Study Opportunity

- Mercury reductions on the order of 85% occur at coal-fired power plants where FGD:SCR pairings are present.
- Bull Run and Kingston are projected to have strong reductions and are in close proximity to the GSMNP, an area that should not be influenced by mercury contamination due to run-off or water discharge issues.

Mercury – A Unique Study Opportunity

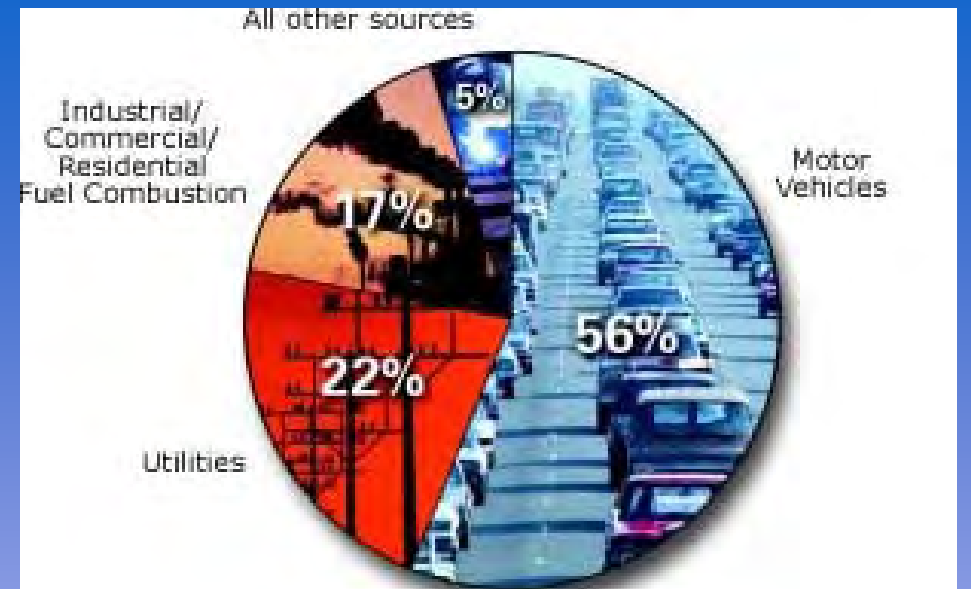
- A mercury deposition sampling program in the GSMNP to document a “before and after” strong localized control of mercury would be an excellent way to gauge the impacts of the controls in an area that should not be impacted by run-off or outfall sources of mercury.
- The study could be used to determine if CAMR, to the extent that Tennessee can influence it, is adequate to protect Tennessee.

Mercury – A Unique Study Opportunity

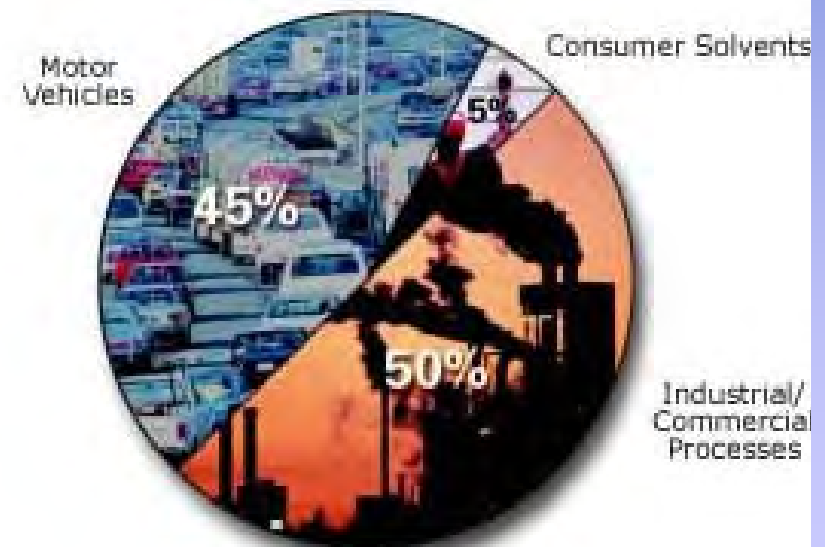
- TDEC has convened a group of interested parties to discuss this opportunity.
- The opportunity also offers additional avenues of study that the NPS may want to pursue in evaluating mercury's impact on the Park and its biota.
- Discussions are underway to have national experts in the field of mercury deposition and bioaccumulation prepare a study plan/proposal, and then seek funding to implement it.

Diesel Emissions

- Mobile Source Emissions Are Significant
- Federal Preemptions At Sec. 209 & 211 of CAA limit state efforts to voluntary measures
- Diesel Working Group seeks to secure voluntary measures from diesel sector



Sources of NOx



Sources of VOC

Diesel Emission Sectors

- School Buses
- Construction Industry
- Agriculture
- Trucking
- Railroad
- Marine



TDEC Joined SmartWaySM As An Affiliate Partner



<http://www.epa.gov/smartway/>

TDEC is a member of the state's
Alternative Fuels Working Group



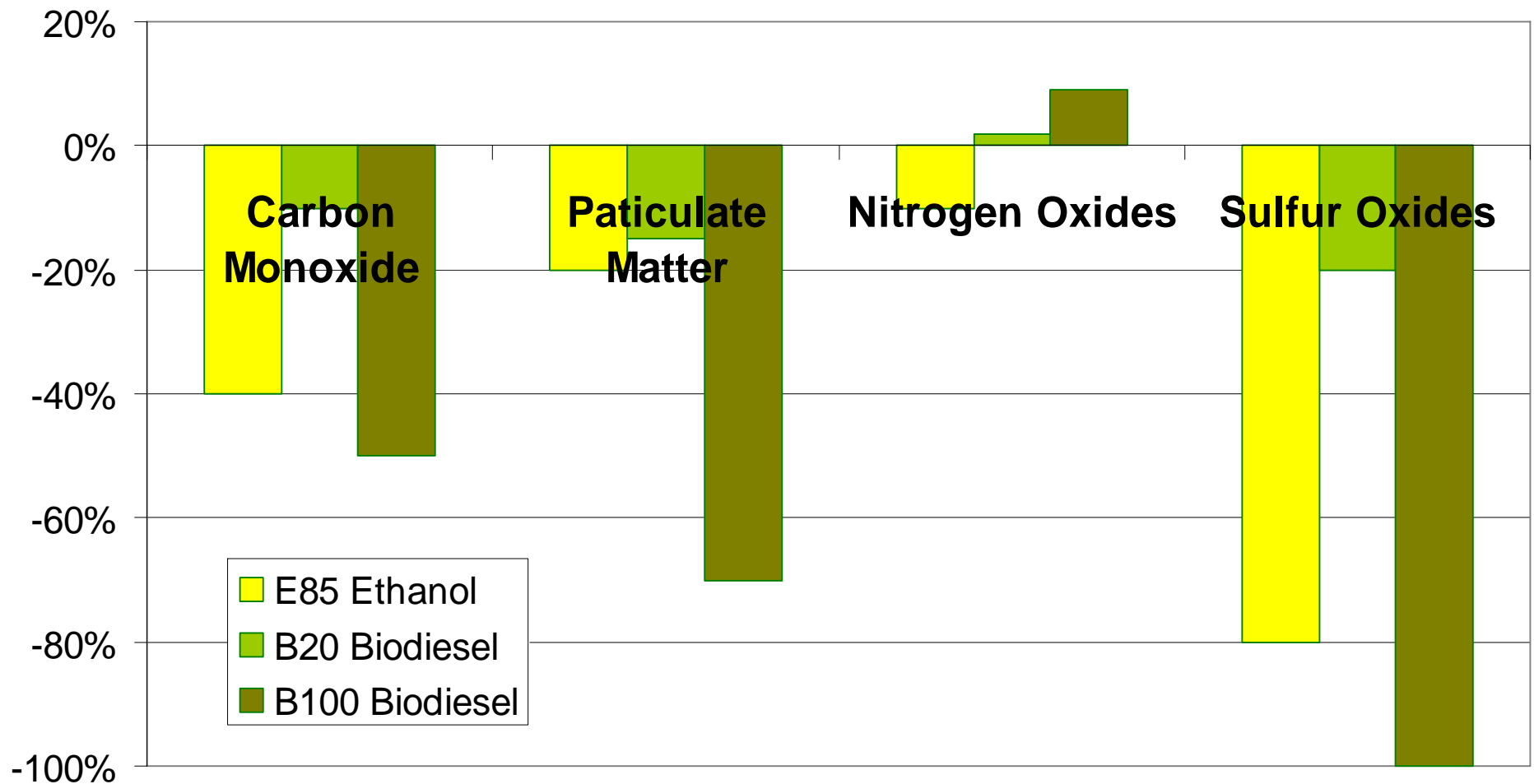
Governor's Interagency Alternative Fuels Working Group



- Executive Order 33
- Six state agencies charged with developing a comprehensive statewide alternative fuels strategy
- Comprehensive program from farm to consumer
- Will position Tennessee to become a leader in alternative fuels
- \$4 million budget

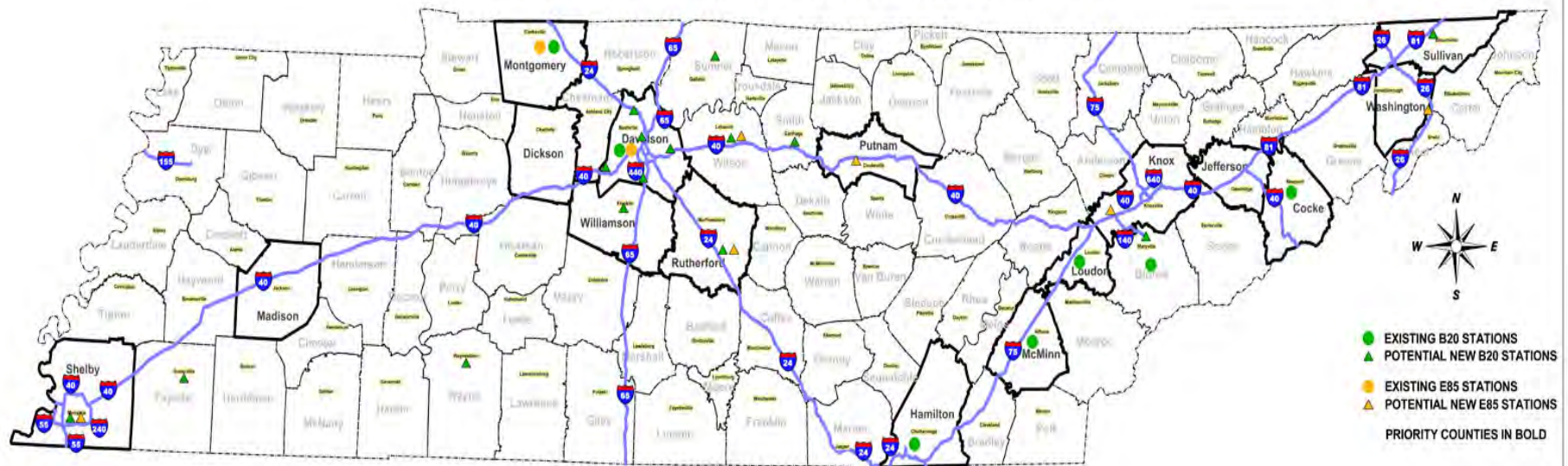
Health and Environmental Benefits

Emission Reductions with Alternative Fuel Use



Establishing “BioFuel” Green Islands

PROPOSED BIOFUEL CORRIDOR SYSTEM





Questions?

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