



Department of the Environment

The Mitigation Working Group Update



Tad Aburn, Air Director, MDE

Commission Meeting – April 25, 2008





The Mitigation Working Group (MWG)

AES Warrior Run	Ed Giugliano
Annie Casey Foundation	Scot Spencer
Baltimore City Community College	Dr. Michelle Harris Bondima
BP Solar	John F. Szallay
Citizen	Frank Heintz
Citizen	Dr. Paul Chan
City of Annapolis	Mike Mallinoff
Constellation Energy	John Quinn
Curtis Engine & Equipment	Thomas Koch
DJ Consulting	Debra Jacobson
	Brad Heavner

THANKS

Maryland Petroleum	Robert E. Dinsion
Mirant	Misty Allen
Mirant	Nancy Floreen
Montgomery County Council	Elizabeth Martin-Perera
Natural Resource Defense Council	Uri Avin
Parsons Brinckerhoff	William Hellmann
Rummel Klepper & Kahl	Richard D'Amato
Synergics Energy	Dr. Lise Van Susteren
The Climate Project	Joel Dunn
The Conservation Fund	William Chandler
Transitions Energy	Matthias Ruth
UM, Center for Integrative Environmental Research	William Livingston
WL Gore	Mark Joseph
Yellow Transportation	





Participants From State Agencies

“Topic Area Experts”

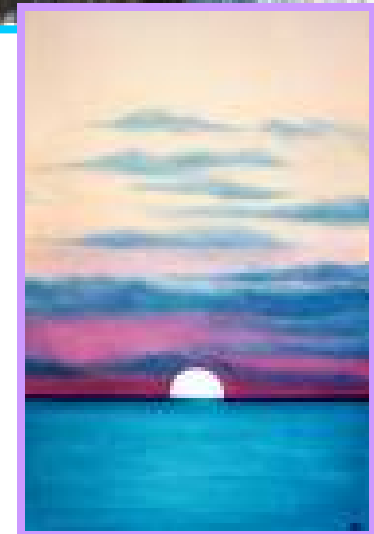
- **Maryland Department of Agriculture**
 - Royden Powell, John Rhoderick, Louise Lawrence
- **Maryland Department of Environment**
 - Brian Hug, Renee Fizer, Liz Entwistle, Marcia Ways, Mary Jane Rutkowski
- **Maryland Department of Natural Resources**
 - Sean McGuire, Pete Dunbar, Dan Rider
- **Maryland Department of Transportation**
 - Caitlin Rayman, Howard Simons
- **Maryland Energy Administration**
 - Michael Li, Crissy Godfrey, Chris Rice
- **Maryland Public Service Commission**
 - John DeFelice, Scott Everngam, Robert Howatt, Jerry Hughes
- **University System of Maryland**
 - Don Boesch, John Frece
- **Maryland Dept of General Services**
 - Ian Tisdale

THANKS



“The Process” – A Refresher

- Mitigation Workgroup (MWG) is developing a list of greenhouse gas emission reduction options for consideration by the Commission
 - Chinese menu now reduced (from over 300) to 50 measures
- MWG supported by 5 Technical Working Groups (TWGs) and State topic area experts who are analyzing each of the 50 measures
- Goal is to have a plan that will achieve a 25% to 50% reduction in Maryland greenhouse gas (ghg) emissions by 2020
 - Other goals (2010, 2015, and 2050 also being looked at)





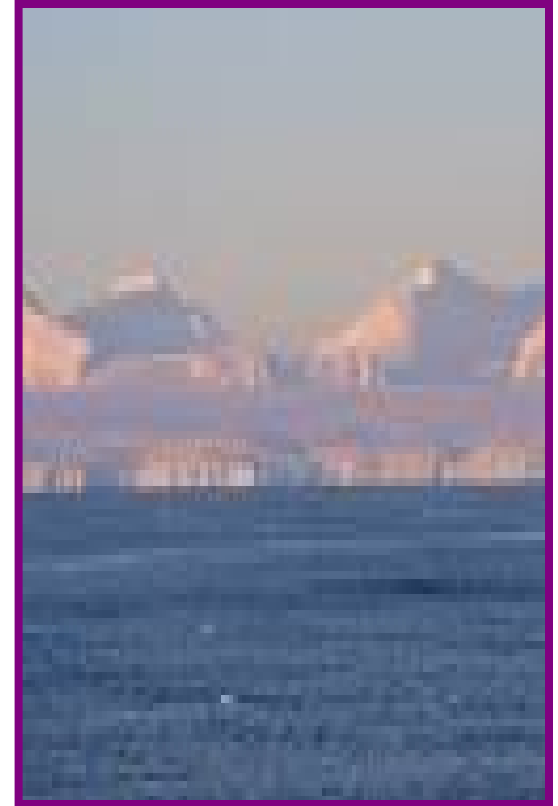
Technical Working Groups

- Agriculture Forestry & Waste Use
- Cross-Cutting Issues
- Energy Supply
- Residential, Commercial, & Industrial Use
- Transportation & Land Use



Policy Options Template

- Policy Description
- Goals, Timing, Coverage
- Implementation Method
- Related Programs & Policies
- Estimated GHG Reductions, Costs and Savings
- Additional (non-GHG) Benefits & Costs
- Feasibility
- Status of Group Approval



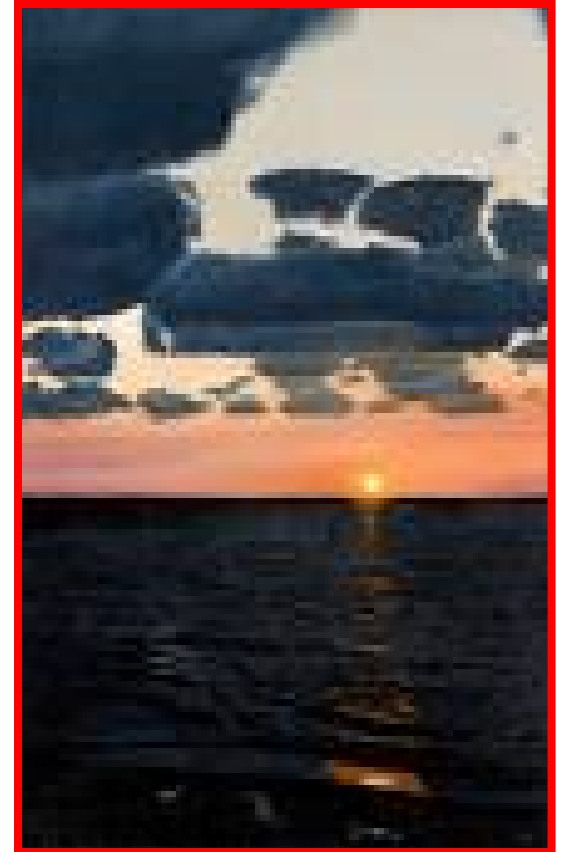
MWG - Quick Update

- Grueling MWG meeting on April 22
- Most of the 50 policy option documents (over 400 pages) have been completed
- Some Transportation/Land Use and Energy Supply policy options are being fine tuned
- MWG has scheduled several calls and a meeting on May 9 to finalize and prioritize the policy options



Getting to the 6/16 Final Report

- Early May – MWG and TWG calls
- May 9 - MWG Meeting
- Mid-May
 - MWG calls and meetings as needed
 - Workshop with State Agency staff
- May 29 Commission Meeting
 - Briefing on Draft Report
- June 13 Commission Meeting
 - To approve Report
- June 16 Commission Meeting
 - Additional meeting or call scheduled if needed



Quick Preview of the Policy Options



- 5 Topic Areas
 - Agriculture/Forestry/Waste
 - Energy Supply
 - Residential/Commercial/Industrial
 - Transportation/Land Use
 - Cross Cutting
- Key Analysis Criteria
 - Reductions
 - Costs
 - Benefits
 - Feasibility
 - Timing



Residential, Commercial and Industrial Strategies

1. Improved Building and Trade Codes for Energy Efficiency
 - Upgrade of building codes
2. Demand Side Management/Energy Efficiency Programs
 - ✓ Recently adopted HB 374 (EmPOWER MD) and SB 268 (RGGI Fund)
3. Low Cost Loans for Energy Efficiency
 - Public-private partnership for low cost loans
 - ✓ Recently passed SB 885/HB1301 (Low cost EE loans)
4. Improved Design, Construction, Appliances, and Lighting in New and Existing State and Local Government Buildings
 - Government Lead by Example - For buildings
 - ✓ Recently adopted SB 208 (High Performance Buildings)





Residential, Commercial and Industrial Strategies

5. More Stringent Appliances/ Equipment Efficiency Standards
 - Minimum energy standards for appliances
 - ✓ Energy Independence and Security Act of 2007
6. Rate Structures and Technology to Promote Reduced GHG Emissions
 - 'Time of use' costs for electricity consumption
7. Energy Efficiency Resource Standards (EERS)
 - ✓ Recently adopted HB 374 (EmPOWER MD)
8. Phase Out Incandescent Light Bulbs in State
 - Replace screw-in incandescent light bulbs
 - ✓ Energy Independence and Security Act of 2007





Residential, Commercial & Industrial Strategies

Option No.	Policy Option	GHG Reductions (MMtCO ₂ e)			Net Present Value 2008-2020 (Million \$)	Cost Effectiveness (\$/tCO ₂ e)
		2012	2020	Total 2008-2020		
RCI-1	Improved Building and Trade Codes for Energy Efficiency	0.6	2.4	14.2	-550	-39
RCI-2	Demand Side Management/Energy Efficiency Programs	1.8	4.6	35.4	-1919	-54
RCI-3	Low Cost Loans for Energy Efficiency	0.3	0.5	4.1	-187	-45
RCI-4	Improved Design, Construction, Appliances, and Lighting in New and Existing State and Local Government Buildings	0.2	1.3	6.7	-355	-53
RCI-7	More Stringent Appliances/ Equipment Efficiency Standards	0.1	0.2	1.2	-63	-54
RCI-8	Rate Structures and Technology to Promote Reduced GHG Emissions	0.1	0.2	2.1	246	116
RCI-10	Energy Efficiency Resource Standards (EERS)	2.9	11.8	70.5	-3648	-52
RCI-11	Phase Out Incandescent Light Bulbs in State	0.1	1.1	7.7	-362	-47





Energy Supply Strategies

1. Promotion of Renewable Energy
 - In-state solar, wind, etc.
 - ✓ Recently passed HB 117 (Solar Easements)
 - ✓ Recently passed HB 377 (Solar/Geothermal Grants)
 - ✓ Recently passed SB 209/HB 375 (Accelerated RPS)
2. Technology-Focused Initiatives for Electricity Supply
 - State to support clean tech R&D
 - ✓ Recently passed HB 1337 (MD Clean Energy Center)
3. GHG Cap and Trade
 - ✓ Already implementing RGGI
4. Combined Capture Storage and Reuse Requirements/
Policies
 - “Clean coal” technology research and incentives
5. Clean Distributed Generation
 - Incentives for local renewables and combined heat/power



Energy Supply Strategies

6. Integrated Resource Planning

- Planning process to meet EmPOWER Maryland goals.

7. Renewable and/ or Environmental Portfolio Standard

- ✓ Recently passed SB 209/HB 375 (Accelerated RPS)
- ✓ Recently passed SB 345/HB1166 (Chicken Litter)

- Other options

8. Efficiency Improvements and Repowering Existing Plants

- Fuel switch away from coal (biomass, gas, etc.)

9. Carbon Tax Concepts

- Taxes to discourage ghg emissions

10. Generation Performance Standards

- Low carbon portfolio required for home grown and imported electricity suppliers



Energy Supply

Option No.	Policy Option	GHG Reductions (MMtCO ₂ e)			Net Present Value 2008-2020 (Million \$)	Cost Effectiveness (\$/tCO ₂ e)
		2012	2020	Total 2008-2020		
ES-1	Promotion of Renewable Energy	0.2	0.5	3.3	\$89	27
ES-2	Technology-Focused Initiatives for Electricity Supply	U	U	U	U	U
ES-3	GHG Cap and Trade					
	a. Account for all reduction under an auction based C&T	U	16.66	U	U	-26.9
	b. Account for only capped level of reduction	U	6.95	U	U	-36.4
ES-4	Combined Capture Storage and Reuse Requirements/ Policies	0	3.4	27.2	\$2,001	73.5
	Low efficiency	0	3.2	25.8	\$1,230	47.8
	Medium efficiency	0	3.4	27.2	\$2,001	73.5
	High efficiency	0	3.6	28.8	\$3,002	104.2
ES-5	Clean Distributed Generation					
	a. Distributed Generation	0.3	1.1	6.7	\$250	37.5
	b. Combined Heat and Power	0.3	1	6.3	\$90	14.4
ES-6	Integrated Resource Planning	U	U	U	U	U
ES-7	Renewable and/ or Environmental Portfolio Standard	5.2	13.8	100.7	\$2,589	25.7
ES-8	Efficiency Improvements and Repowering Existing Plants					
	a. Biomass component	1.2	2	17.9	\$389	21.8
	b. Repowering component	0.5	2.9	15.5	\$980	63.2
ES-9	Carbon Tax Concepts	U	0.1	U	U	355
ES-10	Generation Performance Standards					
	GPS - 1125 lb CO ₂ e per MWh	6.2	6.6	74.3	\$5,155	pending
	GPS - 1100 lb CO ₂ e per MWh	7.1	7.6	85.4	\$5,926	pending
	CPW - 1050 lb CO ₂ e per MWh	8.9	9.6	107.7	\$7,469	pending



Cross-Cutting Strategies

1. GHG Inventories and Forecasting
 - Where we are and where we want to go
2. GHG Reporting and Registry
 - Repository for voluntary reductions
 - MD already part of “The Climate Registry”
3. Statewide GHG Reduction Goals and Targets
 - 10% by 2012, 15% by 2015, 25%-50% by 2020, 90% by 2050
4. State and Local Government GHG Emissions
 - Government Lead by Example
5. Public Education and Outreach
 - Awareness and voluntary action
6. “After Peak Oil” Concepts
 - Evaluate policies and legislation for oil alternatives

Cross-Cutting Strategies

7. Building Institutional Capacity
 - Funding, structure, coordination and more
8. Participate in Regional, Multi-State & National GHG Reduction Efforts
 - Push for national program – Continue with RGGI & other regional efforts
9. Promote Economic Development Opportunities Associated with Reducing GHG Emissions
 - “Green” Jobs
10. Evaluate Climate Change Policy Options to Determine Projected Public Health Risks, Costs and Benefits
 - Special effort focused on public health concerns linked to climate change



Ag/ Forestry and Waste Strategies

1. Forest Management for Enhanced Carbon Sequestration
 - Keep forests bug-free and healthy to store more carbon
 - ✓ Recently passed SB 920 (Gypsy Moth Task Force)
2. Managing Urban Trees and Forests for Greenhouse Gas Benefits
 - Reduce 'heat island' effect and store carbon
 - ✓ Recently passed SB 1000/HB 1604 (Community Parks/Playgrounds)
3. Afforestation, Reforestation and Restoration of Forests and Wetlands
 - Restore lands to store more carbon
4. Protection & Conservation of Agricultural Land, Coastal Wetlands and Forested Land
 - Maintain that which we have to continue storing carbon
 - ✓ Recently passed SB 259 (Project Open Space, local gov't)
 - ✓ Recently passed SB 431 (No Net Loss Task Force)



5. “Buy Local” Programs
 - Stimulate local economy and reduce carbon miles to market
6. Expanded Use of Forest and Farm Feedstock and By-Products for Energy Production
 - Using bio-waste for electricity generation or fuel for cars
 - ✓ Recently passed HB 140 (Cellulosic Ethanol R/D)
 - ✓ Recently passed SB 565 (Bio-heating Oil Credit)
7. In-State Liquid Biofuels Production
 - Grow crops for ethanol and biodiesel
8. Nutrient Trading with Carbon Benefits
 - Cap/trade to reduce CO₂ from over-fertilization
9. Waste Management Through Source Reduction and Advanced Recycling
 - Less trash to landfill



Agriculture Forestry & Waste

Option No.	Policy Option	GHG Reductions (MMtCO2e)			Net Present Value 2008-2020 (Million \$)	Cost Effectiveness (\$/tCO2e)
		2012	2020	Total 2008-2020		
AFW-1	Forest Management for Enhanced Carbon Sequestration	0.04	0.09	0.66	89.1	135
AFW-2	Managing Urban Trees and Forests for Greenhouse Gas Benefits	0.73	1.9	13.27	-2017	-152
AFW-3	Afforestation, Reforestation and Restoration of Forests and Wetlands					
	a. Afforestation	0.21	0.06	3.9	112.7	29
	b. Riparian Areas	0.008	0.05	0.25	11	44
AFW-4	Protection & Conservation of Agricultural Land, Coastal Wetlands and Forested Land					
	a. Agricultural land	0.11	0.28	1.93	168.6	87
	b. Forested land	2.2	2.7	30.5	1128.7	37
	c. Coastal Wetlands	not quantified				
AFW-5	"Buy Local" Programs					
	a. Farmer's Market	0.01	0.032	0.198	-33.1	-167
	b. Local Produce	not quantified				
	c. Locally Grown and Processed Lumber	not quantified				
AFW-6	Expanded Use of Forest and Farm Feedstock and By-Products for Energy Production					
	a. Biomass	0.116	0.5	2.83	34.1	12
	b. Methane utilization from livestock manure and poultry litter	0.014	0.04	0.25	0.06	0.2
AFW-7	In-State Liquid Biofuels Production					
	a. Ethanol	0.36	0.91	2.73	219	80
	b. Biodiesel	0.1	0.17	1.41	10.5	7
AFW-8	Nutrient Trading with Carbon Benefits	0.054	0.14	0.99	-29.7	-30
AFW-9	Waste Management Through Source Reduction and Advanced Recycling	9.34	29.2	184	-1118	-6





Transportation and Land Use Strategies

1. Carbon Fuel Tax

- Gas tax to reduce ghgs

2. Land Use Strategies

- Smart growth

✓ Recently adopted SB 204 (Transit-Oriented Development)

3. Transit

- Double transit service by 2020

4. Low Greenhouse Gas Fuel Standard

- Reduce carbon intensity of on-road fuel

5. Intercity Travel: Aviation, High Speed Rail, Bus & Freight

- Options to reduce automobile trips and on-road freight emissions





Transportation and Land Use Strategies

6. Pay As You Drive Insurance

- Incentive to reduce driving and ghg emissions

7. Reducing Vehicle Miles Traveled (VMT)

- GHG reductions linked to reduced VMT and VMT growth

8. Bike and Pedestrian Infrastructure

- For urban areas

9. Pricing Measures

- Economic incentives and disincentives to reduce ghg emissions

10. Transportation Technologies

- Emission reductions from on-road and off-road vehicles

11. Evaluate the GHG Emission Impacts of Major Projects

- GHG impact analysis for major new road projects



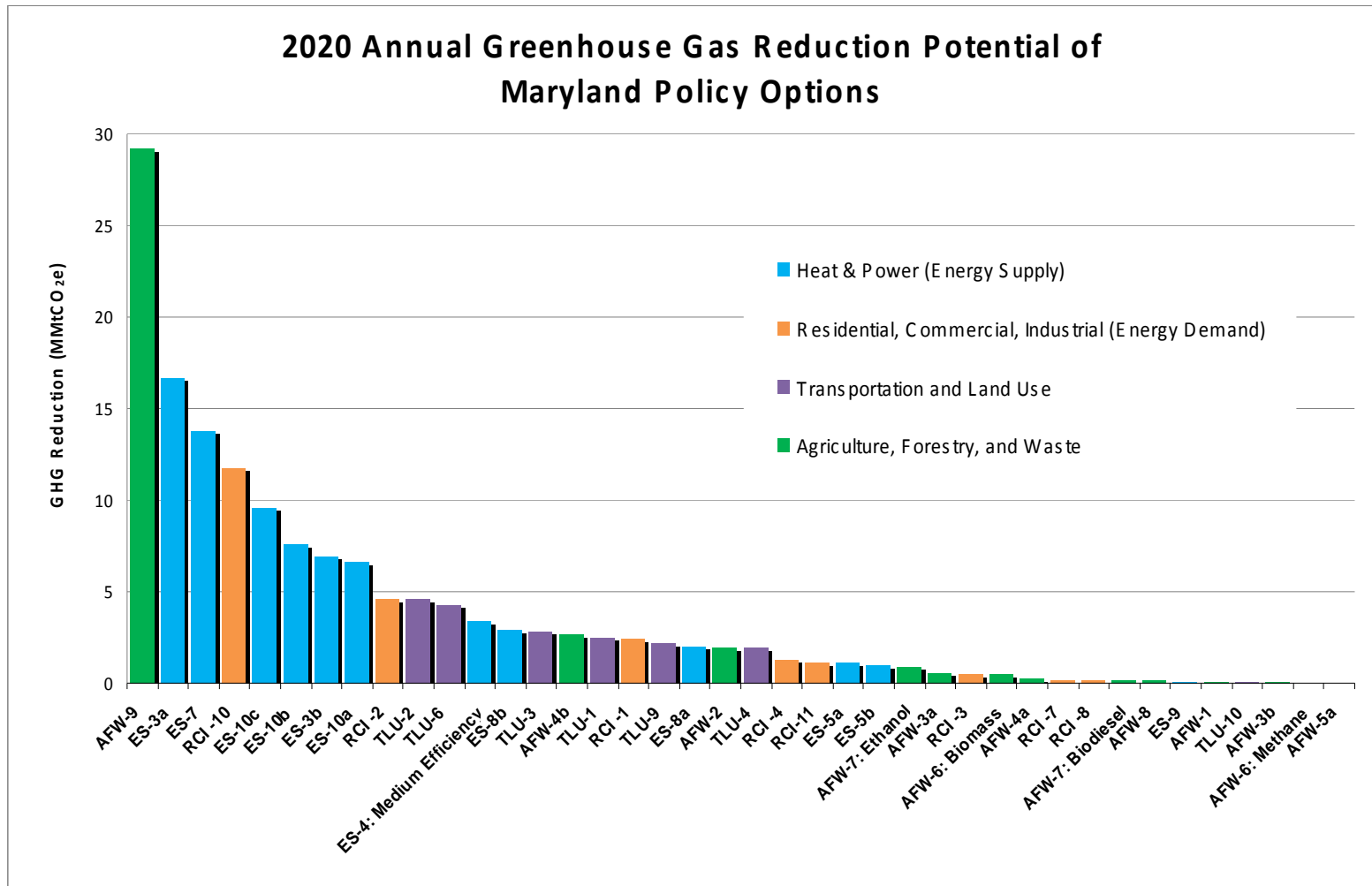


Transportation and Land Use

Option No.	Policy Option	GHG Reductions (MMtCO ₂ e)			Net Present Value 2008-2020 (Million \$)	Cost Effectiveness (\$/tCO ₂ e)
		2012	2020	Total 2008-2020		
TLU-1	Carbon Fuel Tax	0.8	2.5	16.4	N/A (transfer)	
TLU-2	Land Use Strategies	1.1	4.6	27.6	pending	
TLU-3	Transit	1.1	2.8	20.3	pending	
TLU-4	Low Greenhouse Gas Fuel Standard	0.7	1.9	12.8	501.7	30-90
TLU-5	Intercity Travel: Aviation, High Speed Rail, Bus & Freight	pending				
TLU-6	Pay As You Drive Insurance	1	4.3	27.2	pending	
TLU-7	Reducing Vehicle Miles Traveled (VMT)	incorporated into TLU-2				
TLU-8	Bike and Pedestrian Infrastructure	incorporated into TLU-3				
TLU-9	Pricing Measures	1.9	2.2	21	pending	-1 to -643
TLU-10	Transportation Technologies	0.06	0.07	0.62	\$610	200 to 1500
TLU-11	Evaluate the GHG Emission Impacts of Major Projects	U	U	U	U	U



Preliminary Reductions by Policy Option



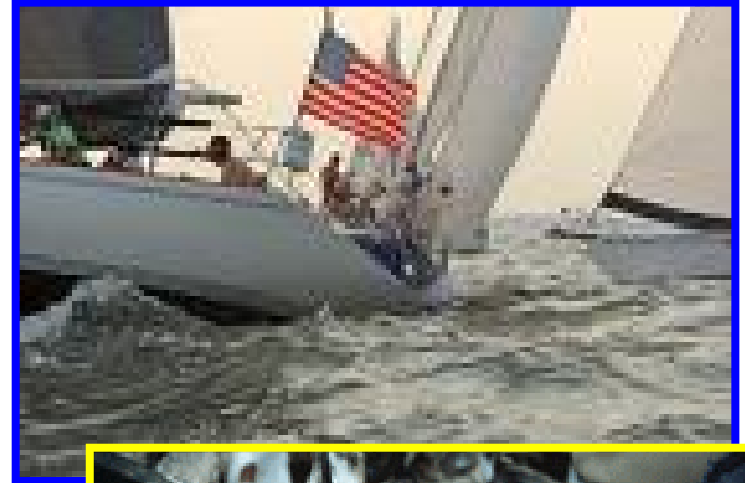
Preliminary Reduction Estimates

- This data is very preliminary
- Needs to be “scrubbed” for double counting
- Some estimates are still being revised
- Tons needed to achieve a 25% to 50% reduction from 2006 levels
 - Our target
 - 50 to 77 tons per year reduction
- Very rough estimate of cumulative total reductions from 50 policy options by 2020
 - 60 to 75 tons per year reduction



Wrap-Up

- Commission Meetings
 - Today – Preview
 - May 29 – Briefing
 - June 13 and 16 – Approval of final report
- MWG and TWG meetings and calls
 - Ongoing
- Workshop with State Agency staff
 - Mid-May



Questions?

