

Appendix

Analysis of Potential Non-Road Source Measures * * *DRAFT February 2006* * * last updated February 16, 2006

Potential Non-Road Source RACM Measures in the Metropolitan Washington Region

Measure Name	Definition	RACM	Reason
Emission Standards for New Engines	Implement new emission standards for new engines.	No	Will not provide reductions by May 2008
Inspection and Maintenance Program for Non-road Engines	Implement Inspection and Maintenance Program for Non-road Engines (smoke test).	No	Will not provide reductions by May 2008
Repower Engines on Non-road Equipment	Implement voluntary or mandatory program to repower engines on non-road equipment.	No	Will not provide reductions by May 2008
Airport Emission Cap	Establish Agreement with Airports Authority to Cap or Reduce Emissions.	No	No creditable emission reduction
Airport Emissions Cap in Upwind Counties	Voluntary Agreement to Cap Airport Emissions Outside the Nonattainment Area.	No	No creditable emission reduction
Clean Air Construction Initiative	Develop alternative programs for state and local governments (public entities) to reduce on-road and off-road construction and maintenance related emissions. Mandatory or Voluntary. Episodic: no work or idling restrictions. Non-episodic: Control retrofits.	No	No creditable emission reduction
Non-Road Diesel Engine Retrofit Program	Develop program to retrofit non-road diesel equipment in public and/or private fleets with emission control devices.	No	No creditable emission reductions
Idling Emission Reduction Programs	Implement programs to reduce idling emissions.	No	No creditable emission reduction
Fleet and Equipment Turnover Programs	Implement programs to expedite the market penetration of new lower emitting technologies and speed the retirement of older equipment.	No	No creditable emission reduction
Fuels Improvement Initiative	Implement programs to facilitate use of fuels and fuel additives to lower emissions.	No	No creditable emission reduction
Marine Sector Initiatives	Develop programs to reduce emissions from the marine sector.	No	No creditable emission reduction
Electrification Programs	Develop programs to replace fossil-fuel powered equipment with electric equipment.	No	No creditable emission reductions
Landscape Initiatives	Implement landscape programs to reduce need for use of lawn and garden equipment.	No	No creditable emission reductions
Airport Congestion Pricing	Charge higher aircraft landing fees during busy times of day to reduce airport delays and congestion.	No	Not economically feasible
Episodic Non-road Emission Reduction Program	Develop program to reduce emissions from non-road equipment during air quality action days.	No	No creditable emission reductions

Measure -- Emission Standards for New Engines

Quick Reference: New Equipment Stds
Measure Name: Emission Standards for New Engines
Description: Implement new emission standards for new engines.
RACM Determination: No
Reason: Will not provide reductions by May 2008

RACM Criterion Summary

Implementation by May 2008	No
Enforceable	Yes
Technologically Feasible	Varies
Economically Feasible	Yes
No Adverse Impacts	Yes
Reductions >0.1 tpd	Yes

Estimated Cost Effectiveness	
Estimated Reductions	

Issues

- Mandatory Measure. Engine emission standards are promulgated by the federal government. States may be able to mandate sale of low-emitting equipment.
- Year of first benefits varies. Some engine standards are OTB/OTW. Others are post 2010.
- Limited short term emission benefit given need for equipment turnover. Need incentives to facilitate turnover and equipment retirement.
- Potentially affects all sectors: agriculture, commercial, industrial, construction, marine, locomotives, aircraft, recreational, lawn and garden.
- Consider EPA's Blue Sky Series engine program.

Summary Analysis

Not RACM. While some new engine standards are included as OTB/OTW, new standards will not be available by May 2008.

Measure -- Inspection and Maintenance Program for Non-road Engines

Quick Reference:	Inspection Maintenance	Description:
Measure Name:	Inspection and Maintenance Program for Non-road Engines	Implement Inspection and Maintenance Program for Non-road Engines (smoke test).
RACM Determination:	No	
Reason:	Will not provide reductions by May 2008	

RACM Criterion Summary

Implementation by May 2008	No
Enforceable	Yes
Technologically Feasible	Yes
Economically Feasible	No
No Adverse Impacts	Yes
Reductions >0.1 tpd	Yes

Estimated Cost Effectiveness	
Estimated Reductions	

Issues

- Mandatory Measure. State government may have authority to require inspection and maintenance for non-road engines. States may be preempted from I/M for certain non-road sectors (e.g., aircraft).
- Year of first benefits is 2009.
- Not viable for all sectors. Potential to affect agriculture, commercial, industrial, construction, and marine. Low or no potential for locomotives, aircraft, recreational, lawn and garden.

Summary Analysis

Not RACM. Will not provide emission reductions by May 2008.

Measure -- Repower Engines on Non-road Equipment

Quick Reference: Repower
Measure Name: Repower Engines on Non-road Equipment

Description:
Implement voluntary or mandatory program to repower engines on non-road equipment.

RACM Determination: No
Reason: Will not provide reductions by May 2008

RACM Criterion Summary

Implementation by May 2008	No
Enforceable	-
Technologically Feasible	Varies
Economically Feasible	No
No Adverse Impacts	No
Reductions >0.1 tpd	Yes

Issues

- Mandatory Measure. State government could consider requiring repowering of certain equipment types. States are preempted from regulating certain non-road sectors (e.g., aircraft, locomotives).
- Year of first benefits is 2009. Some limited emission reduction possible under voluntary approach. Consider innovative bundle.
- Primarily affects: commercial marine engines and locomotives.

Estimated Cost Effectiveness	
Estimated Reductions	

Summary Analysis

Not RACM. Will not provide reductions by May 2008.

Measure -- Airport Emission Cap

Quick Reference: Airport Cap
Measure Name: Airport Emission Cap

Description:
 Establish Agreement with Airports Authority to Cap or Reduce Emissions.

RACM Determination: No
Reason: No creditable emission reduction

RACM Criterion Summary

Implementation by May 2008	Yes
Enforceable	No
Technologically Feasible	-
Economically Feasible	-
No Adverse Impacts	Yes
Reductions >0.1 tpd	Yes

Estimated Cost Effectiveness	
Estimated Reductions	

Issues

- Voluntary measure. May be included as part of the Innovative Measures Bundle.
- Year of first benefits is 2007 for voluntary approach.
- Consider electric GSE, GSE retrofits, GSE idling controls, gate electrification.
- This measure would require the airports authority to cap emissions from airport sources not subject to federal preemption.
- This measure could also involve the airports authority entering into agreements with airlines to cap or reduce emissions.

Summary Analysis

Not RACM. No creditable emission reduction.

Measure -- Airport Emissions Cap in Upwind Counties

Quick Reference: Upwind Airports
Measure Name: Airport Emissions Cap in Upwind Counties

Description:
 Voluntary Agreement to Cap Airport Emissions Outside the Nonattainment Area.

RACM Determination: No
Reason: No creditable emission reduction

RACM Criterion Summary

Implementation by May 2008	Yes
Enforceable	No
Technologically Feasible	-
Economically Feasible	-
No Adverse Impacts	Yes
Reductions >0.1 tpd	Yes

Estimated Cost Effectiveness	
Estimated Reductions	

Issues

- Voluntary measure. May be included as part of the Innovative Measures Bundle.
- Year of first benefits is 2007 for voluntary approach.
- Consider electric GSE, GSE retrofits, GSE idling controls, gate electrification.
- This measure would require the airports authority to cap emissions from airport sources not subject to federal preemption.
- This measure could also involve the airports authority entering into agreements with airlines to cap or reduce emissions.

Summary Analysis

Not RACM. No creditable emission reduction.

Measure -- Clean Air Construction Initiative

Quick Reference: Construction Initiative
Measure Name: Clean Air Construction Initiative
RACM Determination: No
Reason: No creditable emission reduction

Description:
 Develop alternative programs for state and local governments (public entities) to reduce on-road and off-road construction and maintenance related emissions. Mandatory or Voluntary. Episodic: no work or idling restrictions. Non-episodic: Control retrofits.

RACM Criterion Summary

Implementation by May 2008	No
Enforceable	-
Technologically Feasible	Yes
Economically Feasible	Yes
No Adverse Impacts	No
Reductions >0.1 tpd	Yes

Estimated Cost Effectiveness	
Estimated Reductions	

Issues

- Mandatory or Voluntary Measure. May be included as part of the Innovative Measures Bundle.
- Year of first benefits is 2007 for voluntary approach. Mandatory measure would not provide benefits by May 2008.
- Potential adverse impacts if mandatory.
- Most likely approaches would be emission control retrofits and idling reduction. Limited potential for repowering or electrification.
- Consider establishing grant or revolving loan fund program and amending contracting policy. CMAQ funding potential for transportation construction and maintenance contracts.

Summary Analysis

Not RACM. No creditable emission reduction for episodic approach. Not available by May 2008 and potential adverse impacts with mandatory approach.

Measure -- Non-Road Diesel Engine Retrofit Program

Quick Reference: Retrofits
Measure Name: Non-Road Diesel Engine Retrofit Program

Description:
 Develop program to retrofit non-road diesel equipment in public and/or private fleets with emission control devices.

RACM Determination: No
Reason: No creditable emission reductions

RACM Criterion Summary

Implementation by May 2008	No
Enforceable	Yes
Technologically Feasible	Yes
Economically Feasible	Yes
No Adverse Impacts	-
Reductions >0.1 tpd	Yes

Estimated Cost Effectiveness	
Estimated Reductions	

Issues

- Mandatory or Voluntary Measure. May be included as part of the Innovative Measures Bundle.
- Year of first benefits is 2007 for voluntary approach. Mandatory measure would not provide benefits by May 2008.
- Potential adverse impacts if mandatory.
- Emission control retrofits are most applicable for non-road equipment operating under high load, including certain types of municipal and construction equipment.
- Retrofits have also been proposed for portable generators and other light commercial equipment.
- Consider establishing grant or revolving loan fund program and amending contracting policy. Consider recent New Jersey legislative approach. CMAQ funding potential for transportation construction and maintenance contracts. Work with the Mid-Atlantic Diesel Collaborative.

Summary Analysis

Not RACM. No creditable emission reductions for voluntary approach. Mandatory approach would not provide benefits by May 2008.

Measure -- Idling Emission Reduction Programs

Quick Reference: Idling
Measure Name: Idling Emission Reduction Programs

Description:
 Implement programs to reduce idling emissions.

RACM Determination: No
Reason: No creditable emission reduction

RACM Criterion Summary

Implementation by May 2008	No
Enforceable	Yes
Technologically Feasible	Yes
Economically Feasible	-
No Adverse Impacts	Yes
Reductions >0.1 tpd	Yes

Estimated Cost Effectiveness	
Estimated Reductions	

Issues

- Mandatory or Voluntary Measure. May be included as part of the Innovative Measures Bundle.
- Year of first benefits is 2007 for voluntary approach. Mandatory measure would not provide benefits by May 2008.
- Idling restrictions can be mandated. Idling reduction technologies (e.g., APUs) can be installed on certain equipment.
- Potentially affects several sectors: agriculture, commercial, industrial, construction, marine, locomotives, airport equipment, recreational, lawn and garden.
- Consider establishing grant or revolving loan fund program to fund installation of APUs. Consider recent New Jersey legislative approach. May need to address enforcement issues.

Summary Analysis

Not RACM. No creditable emission reduction.

Measure -- Fleet and Equipment Turnover Programs

Quick Reference: Equipment Turnover
Measure Name: Fleet and Equipment Turnover Programs

Description:
 Implement programs to expedite the market penetration of new lower emitting technologies and speed the retirement of older equipment.

RACM Determination: No
Reason: No creditable emission reduction

RACM Criterion Summary

Implementation by May 2008	No
Enforceable	Yes
Technologically Feasible	Yes
Economically Feasible	-
No Adverse Impacts	Yes
Reductions >0.1 tpd	Yes

Estimated Cost Effectiveness	
Estimated Reductions	

Issues

- Voluntary Measure. May be included as part of the Innovative Measures Bundle. Otherwise known as "Cash for Clunkers." Mandatory Fleet Rules have also been proposed.
- Year of first benefits is 2007 for voluntary approach. Mandatory measure would not provide benefits by May 2008.
- Fleet turnover can be facilitated by providing rebates, tax credits, graduated fees, grants, and performance contracts.
- Potentially affects several sectors: agriculture, commercial, industrial, construction, marine, locomotives, airport equipment, recreational, lawn and garden.
- Proposed equipment: outboard motors, lawnmowers, chainsaws.

Summary Analysis

Not RACM. No creditable emission reduction.

Measure -- Fuels Improvement Initiative

Quick Reference: Fuels
Measure Name: Fuels Improvement Initiative
RACM Determination: No
Reason: No creditable emission reduction

Description:
 Implement programs to facilitate use of fuels and fuel additives to lower emissions.

RACM Criterion Summary

Implementation by May 2008	No
Enforceable	No
Technologically Feasible	-
Economically Feasible	-
No Adverse Impacts	Yes
Reductions >0.1 tpd	Yes

Estimated Cost Effectiveness	
Estimated Reductions	

Issues

- Voluntary or Mandatory Measure. Also proposed as an episodic approach.
- Year of first benefits is 2007 for voluntary approach. Mandatory measure would not provide benefits by May 2008.
- Proposals include: increased use of biodiesel, increased use of low-Nox fuel additives, and increasing cetane levels.
- Potentially affects several sectors: agriculture, commercial, industrial, construction, marine, locomotives, airport equipment, recreational, lawn and garden.
- Gasoline and diesel tax increases have also been proposed.

Summary Analysis

Not RACM. No creditable emission reduction if voluntary approach. Mandatory measure will not provide reductions by May 2008. Episodic measure not enforceable. Cetane rules may be challenging to implement in a small region. Low-NOx fuel additives may have only minimal impact on emissions in the region.

Measure -- Marine Sector Initiatives

Quick Reference: Marine
Measure Name: Marine Sector Initiatives

Description:
 Develop programs to reduce emissions from the marine sector.

RACM Determination: No
Reason: No creditable emission reduction

RACM Criterion Summary

Implementation by May 2008	No
Enforceable	Yes
Technologically Feasible	Yes
Economically Feasible	-
No Adverse Impacts	-
Reductions >0.1 tpd	Yes

Estimated Cost Effectiveness	
Estimated Reductions	

Issues

- Mandatory or Voluntary Measure. May be included as part of the Innovative Measures Bundle.
- Year of first benefits is 2007 for voluntary approach. Mandatory measure would not provide benefits by May 2008.
- Proposed approaches include tug boat activity restrictions and reducing emissions from upwind port operations.
- Most likely approaches would be emission control retrofits and idling reduction. Limited potential for repowering or electrification.

Summary Analysis

Not RACM. No creditable emission reduction for episodic approach. Mandatory approach would not provide benefits by May 2008. Potential adverse impacts with mandatory approach limiting tugboat activities. IAQC is considering potential for upwind controls.

Measure -- Electrification Programs

Quick Reference: Electrify
Measure Name: Electrification Programs

Description:
 Develop programs to replace fossil-fuel powered equipment with electric equipment.

RACM Determination: No
Reason: No creditable emission reductions

RACM Criterion Summary

Implementation by May 2008	No
Enforceable	Yes
Technologically Feasible	Varies
Economically Feasible	Varies
No Adverse Impacts	-
Reductions >0.1 tpd	Yes

Estimated Cost Effectiveness	
Estimated Reductions	

Issues

- Mandatory or Voluntary Measure. May be included as part of the Innovative Measures Bundle.
- Year of first benefits is 2007 for voluntary approach. Mandatory measure would not provide benefits by May 2008.
- Potential adverse impacts if mandatory.
- Electrification strategies could impact airports, light industrial and commercial, and lawn and garden sectors.
- Measure could be considered as an equipment turnover strategy.

Summary Analysis

Not RACM. No creditable emission reduction if voluntary approach. Mandatory measure will not provide reductions by May 2008. A small number of electric equipment replacements may have only minimal impact on emissions in the region. Aircraft gate electrification has been proposed.

Measure -- Landscape Initiatives

Quick Reference: Landscape
Measure Name: Landscape Initiatives

Description:
 Implement landscape programs to reduce need for use of lawn and garden equipment.

RACM Determination: No
Reason: No creditable emission reductions

RACM Criterion Summary

Implementation by May 2008	No
Enforceable	Yes
Technologically Feasible	Yes
Economically Feasible	-
No Adverse Impacts	Yes
Reductions >0.1 tpd	Yes

Estimated Cost Effectiveness	
Estimated Reductions	

Issues

- Voluntary Measure. May be included as part of the Innovative Measures Bundle.
- Year of first benefits is 2007 for voluntary approach.
- Landscape strategies proposed include xeriscaping and "Lawn Care for Cleaner Air" voluntary approaches.

Summary Analysis

Not RACM. No creditable emission reduction.

Measure -- Airport Congestion Pricing

Quick Reference: Air Congest Pricing
Measure Name: Airport Congestion Pricing

Description:
 Charge higher aircraft landing fees during busy times of day to reduce airport delays and congestion.

RACM Determination: No
Reason: Not economically feasible

RACM Criterion Summary

Implementation by May 2008	No
Enforceable	Yes
Technologically Feasible	Yes
Economically Feasible	No
No Adverse Impacts	Yes
Reductions >0.1 tpd	Yes

Estimated Cost Effectiveness	
Estimated Reductions	

Issues

- This measure could be adopted as either a voluntary or mandatory measure.
- If a mandatory measure, all three states require well over 12 months to develop, pass and require compliance with a regulation.
- Year of first benefits is 2009.

Summary Analysis

Not RACM. Not economically feasible. No reductions by May 2008.

Measure -- Episodic Non-road Emission Reduction Program

Quick Reference:	Episodic	Description:
Measure Name:	Episodic Non-road Emission Reduction Program	Develop program to reduce emissions from non-road equipment during air quality action days.
RACM Determination:	No	
Reason:	No creditable emission reductions	

RACM Criterion Summary

Implementation by May 2008	No
Enforceable	No
Technologically Feasible	Yes
Economically Feasible	-
No Adverse Impacts	-
Reductions >0.1 tpd	Yes

Estimated Cost Effectiveness	
Estimated Reductions	

Issues

- Mandatory or Voluntary Measure. May be included as part of the Innovative Measures Bundle.
- Year of first benefits is 2007 for voluntary approach. Mandatory measure would not provide benefits by May 2008.
- Potential adverse impacts if mandatory.
- Proposed episodic measures include no idling policy and use restrictions (e.g., no mowing).
- Potentially affects several sectors: agriculture, commercial, industrial, construction, marine, locomotives, airport equipment, recreational, lawn and garden.

Summary Analysis

Not RACM. No creditable emission reductions for voluntary approach. Mandatory approach would not provide benefits by May 2008.
