

Chapter 4: National Sources and the Regulatory Approach

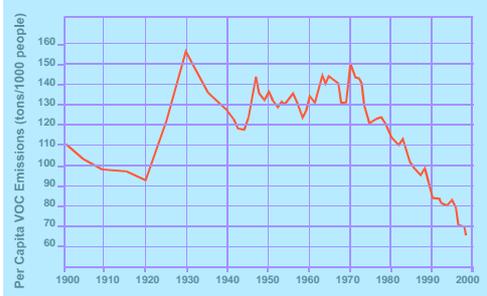
	Chapter 4
	National Sources and the Regulatory Approach

National Sources and the Regulatory Approach
<ul style="list-style-type: none">• Emission trends• Emission inventory• Regulatory approach<ul style="list-style-type: none">• Nonattainment area classifications• Regulation of existing sources• Regulation of new and modified sources• Regulation of hazardous air pollutants

Trend in National VOC Emissions


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Trend in National Per Capita VOC Emissions



National Anthropogenic VOC Emissions

Source Category	Emissions (10 ³ tons/year)				%
	1980	1990	2000	2007	
On-road vehicles	13,869	9,388	5,325	3,602	19.6
Non-road vehicles and engines	2,192	2,662	2,644	2,650	14.4
Stationary fuel combustion	1,050	1,005	1,184	1,626	8.8
Industrial processes	12,104	9,008	7,210	6,881	37.4
Waste disposal and recycling	758	986	415	381	2.1
Miscellaneous	1,134	1,059	733	3,283	17.8
Total	31,107	24,108	17,511	18,423	100.0

Emissions from On-Road Vehicles

	1980	1990	2000	2002	%
On-road vehicles	13,869	9,388	5,325	4,543	27.5
Light-duty gas vehicles & motorcycles	9,304	5,690	2,903	2,496	15.1
Light-duty gas trucks	2,864	2,617	1,929	1,638	9.9
Heavy-duty gas vehicles	1,198	633	256	201	1.2
Diesel vehicles	503	448	238	208	1.3

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Emissions from Non-Road Vehicles and Engines

	1980	1990	2000	2002	%
Non-road vehicles and engines	2,192	2,662	2,644	2,688	16.2
Aircraft	53	30	27	21	0.1
Railroads	46	37	39	35	0.2
Marine vessels	30	31	32	32	0.2
Recreational marine vessels	607	639	788	790	4.8
Recreational equipment	334	417	468	504	3.0
Lawn and garden equipment	698	938	819	800	4.8
Farm equipment	65	94	84	76	0.5
Commercial equipment	126	220	185	172	1.0
Construction equipment	132	163	143	135	0.8
Industrial equipment	91	79	45	38	0.2
Other non-road equipment	6	14	17	87	0.5

Emissions from Stationary Fuel Combustion

	1980	1990	2000	2002	%
Stationary fuel combustion	1,050	1,005	1,184	1,012	6.1
Electric utility	45	47	62	52	0.3
Industrial	157	182	173	170	1.0
Commercial	11	12	20	19	0.1
Residential	837	756	922	765	4.6
Other		8	6	5	0.0

National Industrial VOC Emissions

Source Category	Emissions (10 ³ tons/year)				%
	1980	1990	2000	2007	
Chemical manufacturing	1,595	634	254	244	3.5
Metals processing	273	122	67	46	0.7
Petroleum industries	1,440	611	428	590	8.5
Solvent utilization	6,584	5,750	4,831	4,263	61.1
Storage and transport	1,975	1,490	1,176	1,411	20.2
Other industrial processes	237	401	454	428	6.1
Total	11,101	9,008	7,210	6,982	100.0

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Emissions from Solvent Utilization

	1980	1990	2000	2002	%
Solvent utilization	5,578	3,850	2,918	2,961	56.6
Degreasing	513	744	393	488	9.3
Graphic arts	373	274	261	251	4.8
Dry cleaning	320	215	149	65	1.2
Surface coating	3,685	2,523	1,953	2,049	39.2
Other	690	94	107	104	2.0

Emissions from Non-Industrial Solvent Use

	1980	1990	2000	2002	%
Non-industrial solvent use	1,002	1,900	1,913	1,731	10.5
Cutback asphalt	323	199	193	189	1.1
Pesticide application	241	258	483	676	4.1
Adhesives		361	197	76	0.5
Consumer solvents			900	721	4.4
Other	437	438	140	68	0.4

Emissions from Storage and Transport

	1980	1990	2000	2002	%
Storage and transport	1,975	1,490	1,176	1,205	23.0
Petroleum product storage	823	511	239	279	5.3
Petroleum product transport	61	151	63	56	1.1
Service stations	1,044	785	843	843	16.1
Organic chemical storage/transport	46	40	28	25	0.5
Other		2	2	3	0.1

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Emissions from Petroleum Industries

	1980	1990	2000	2002	%
Petroleum industries	1,440	611	428	375	7.2
Oil and gas production	379	301	309	300	5.7
Petroleum refining	1,045	307	110	65	1.2
Asphalt manufacturing	16	3	10	10	0.2

Emissions from Chemical Manufacturing

	1980	1990	2000	2002	%
Chemical manufacturing	1,595	634	254	214	4.1
Organic chemicals	884	192	76	48	0.9
Inorganic chemicals	93	2	4	5	0.1
Polymers and resins	384	242	101	99	1.9
Pharmaceuticals	77	20	8	4	0.1
Other	157	178	66	58	1.1

Biogenic Emissions (2002)

Biogenic	41.843 x 10 ⁶ tons	66.41%
Anthropogenic	21.163 x 10 ⁶ tons	35.59%
Total	63.006 x 10 ⁶ tons	100.00%

Regulatory Approach

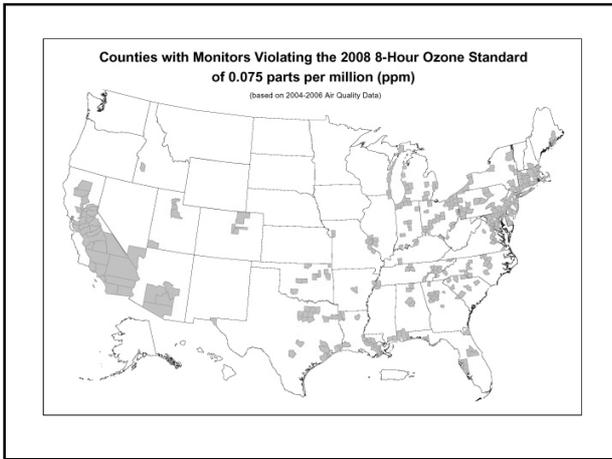
Ozone NAAQS

- 0.08 ppm 1-hour standard set in 1971 (photochemical oxidants)
- 0.12 ppm 1-hour standard set in 1979
 - Revoked June 15, 2005, in all but EAC areas
 - Revoked April 15, 2009, in EAC areas
- 0.08 ppm 8-hour standard set in 1997
- 0.075 ppm 8-hour standard set in 2008

2008 8-Hour Ozone NAAQS

- 0.075 ppm
- Compliance based on 3-year average of the fourth-highest daily maximum 8-hour average concentration

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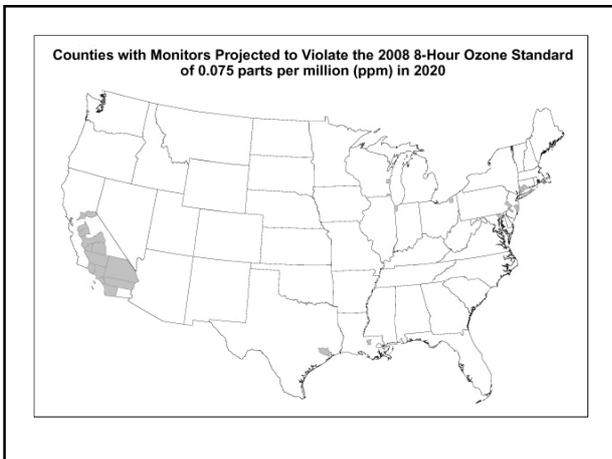


Implementing the Standard

March 2009 States recommend area designations

March 2010 EPA issues area designations

March 2013 States submit SIPs



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1997 8-Hour Ozone NAAQS

- 0.08 ppm
- Compliance based on 3-year average of the fourth-highest daily maximum 8-hour average concentration

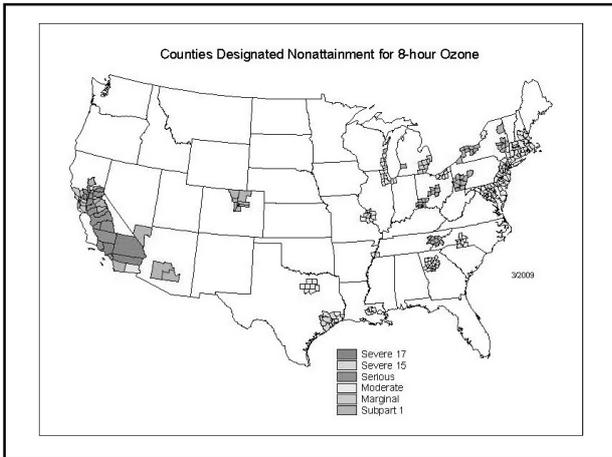
Non-Attainment Designations (Phase 1)

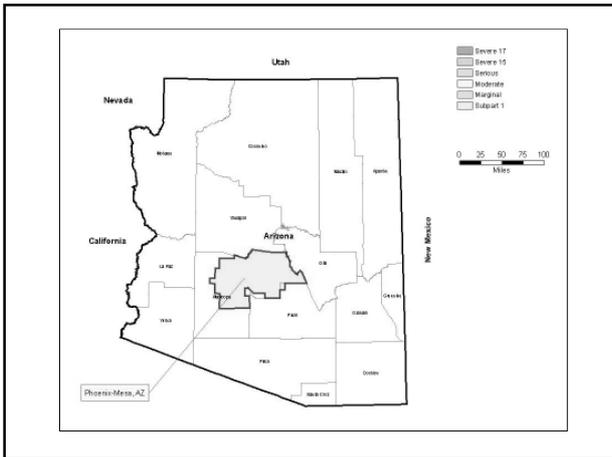
- Basic non-attainment areas (Subpart 1)
 - Areas with 1-hour design value less than 0.121 ppm
 - Attainment deadline June 15, 2009
 - Deadline may be extended to June 15, 2015
- Classified non-attainment areas (Subpart 2)
 - Areas with 1-hour design value greater than 0.121 ppm

Non-Attainment Area Classifications

Classification	8-hr Design Value (ppm)	Attainment Deadline
Marginal	0.085-0.092	June 15, 2007
Moderate	0.092-0.107	June 15, 2010
Serious	0.107-0.120	June 15, 2013
Severe-15	0.120-0.127	June 15, 2019
Severe-17	0.127-0.187	June 15, 2021
Extreme	>0.187	June 15, 2024

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Early Action Compact Areas

- Gave areas flexibility to develop their own approach to compliance
- Only areas meeting 1-hour standard were eligible
- Had to meet agreed upon milestones
- Certain CAA requirements were deferred
- Attainment deadline was December 31, 2007

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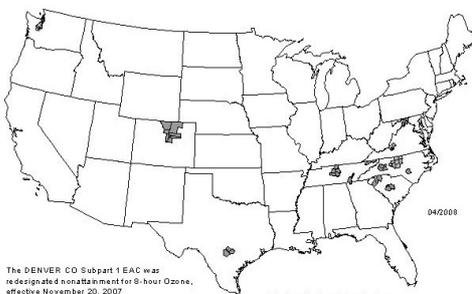
State Implementation Plan (Phase 2)

- Attainment demonstrations and modeling
- Reasonable further progress
- Reasonably available control measures
- Reasonable available control technology
- New source review requirements
- Reformulated gasoline regulation

Counties with Monitors Violating the 1997 8-Hour Ozone Standard of 0.08 parts per million (ppm)
(based on 2004-2006 Air Quality Data)



EAC Areas Designated Attainment



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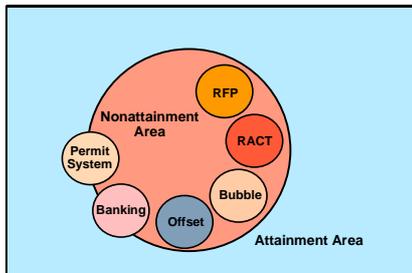
Historical Ozone Implementation Strategies

- Focus
 - VOC controls
 - Metropolitan area
- 1991 NAS report recommended focus on NO_x controls
- Ozone Transport Commission established by CAAA of 1990

Historical Ozone Implementation Strategies

- Ozone Transport Assessment Group (OTAG)
 - Formed in 1995 by 37 states to address ozone regional transport
 - Conducted 2-year comprehensive study
 - Recommended regional NO_x controls

Regulation of Existing Sources



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Determining RACT

- RACT/BACT/LAER Clearinghouse (RBLC)
 - Control technology determinations
 - Regulation database
- Control Techniques Guideline Documents (CTGs)
- Alternative Control Technology Documents (ACTs)

Control Technique Guideline Documents

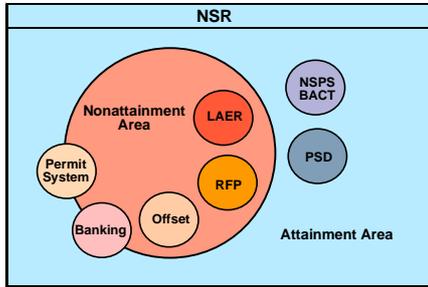
- Definition of the affected facilities
- Number of affected facilities in the country
- National VOC emissions from the facilities
- VOC emission range per facility
- Source size emitting at least 100 tons/year
- Recommended RACT emission limit
- VOC reduction per facility after RACT is applied
- Capital and annual costs and cost per ton of VOC removed

Alternative Control Technology Documents

- Issued without peer review
- Contain descriptions of alternative controls
- Do not recommend an RACT limit

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Regulation of New and Modified Sources



Determining BACT and LAER

- RACT/BACT/LAER Clearinghouse (RBLC)
- New Source Performance Standards (40CFR60)

Regulation of Hazardous Air Pollutants

MACT Standards for VHAP Sources (40CFR63)
