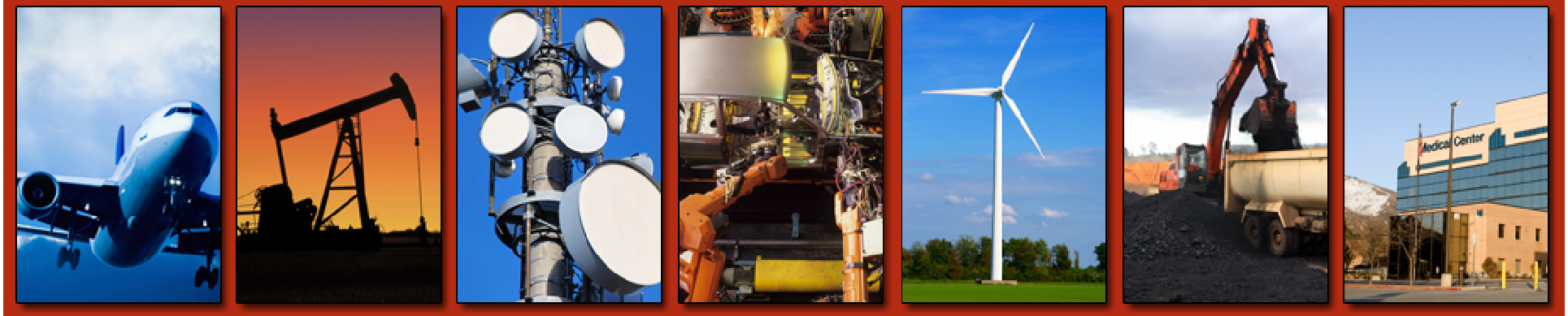

Colorado Ozone SIP Update

For the Rocky Mountain EHS Peer Group

John R. Jacus
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January 29, 2009

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FINANCE & ACQUISITIONS . TRIAL . NATURAL RESOURCES

History of DMA/NFR Ozone Controls

- 1997: EPA establishes 8-hour Ozone NAAQS of 0.08 ppm.
- 2002: State enters into Early Action Compact with EPA.
- 2004: Ozone Action Plan Rulemaking to promulgate controls to meet EAC requirements – Primarily Condensate Tank Controls & RICE.
- 2006: Regulation No. 7 Revisions increase tank control requirements from 47.5% to 75% - NFR Vehicle I/M Program also Dismantled.

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History of DMA/NFR Ozone Controls

- 2007: Denver/North Front Range fails to meet EAC requirements, and EPA designates nine-county Denver/North Front Range Area ("NAA") non-attainment for ozone ('97 Standard of 0.08)
- March 2008: EPA establishes stricter 8-hour Ozone NAAQS of 0.075 ppm – no implementation guidance yet, SIP development still a few years off.
- December 2008: Ozone Action Plan Rulemaking to demonstrate attainment of 0.08 ppm standard in 2010.

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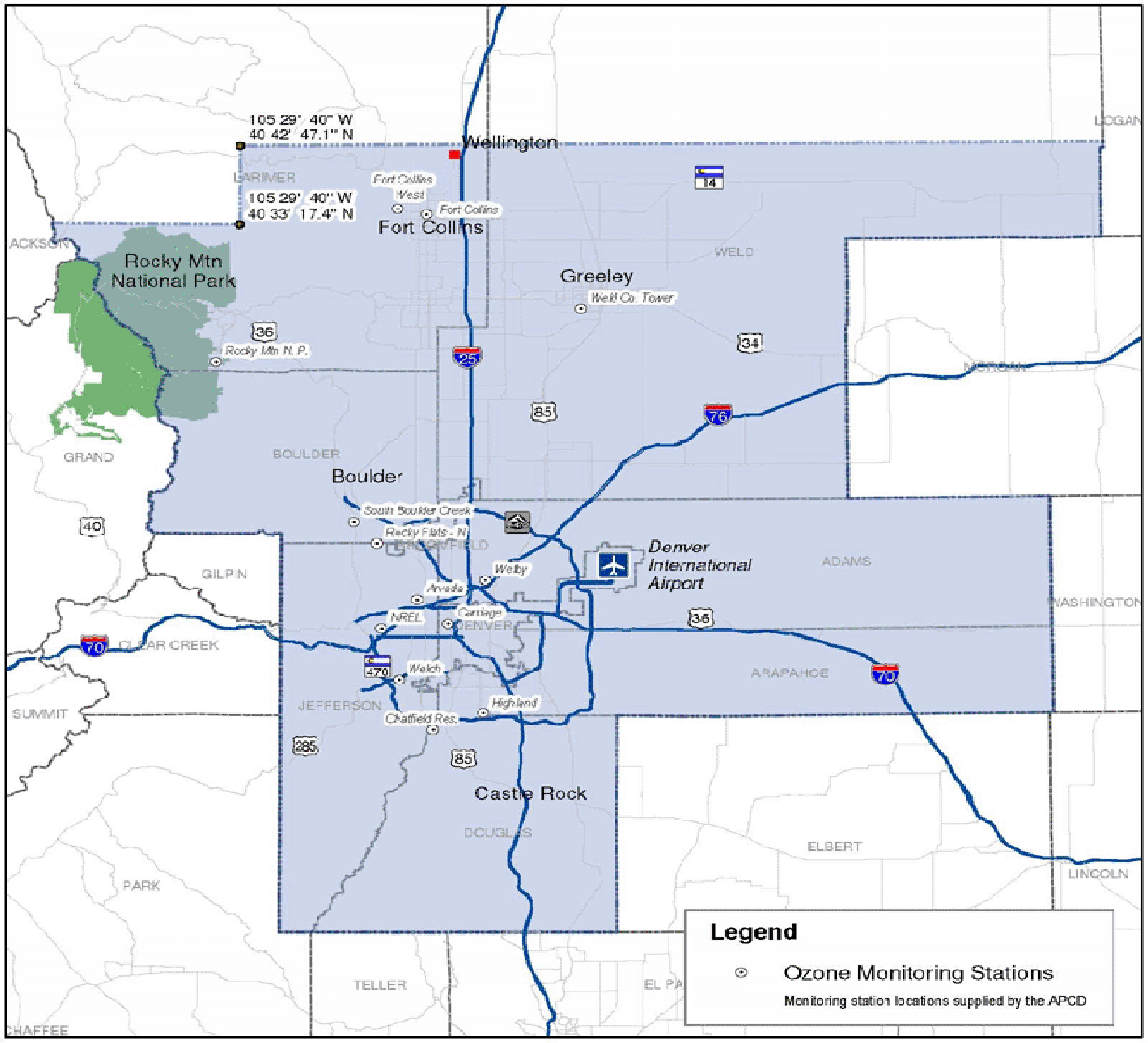


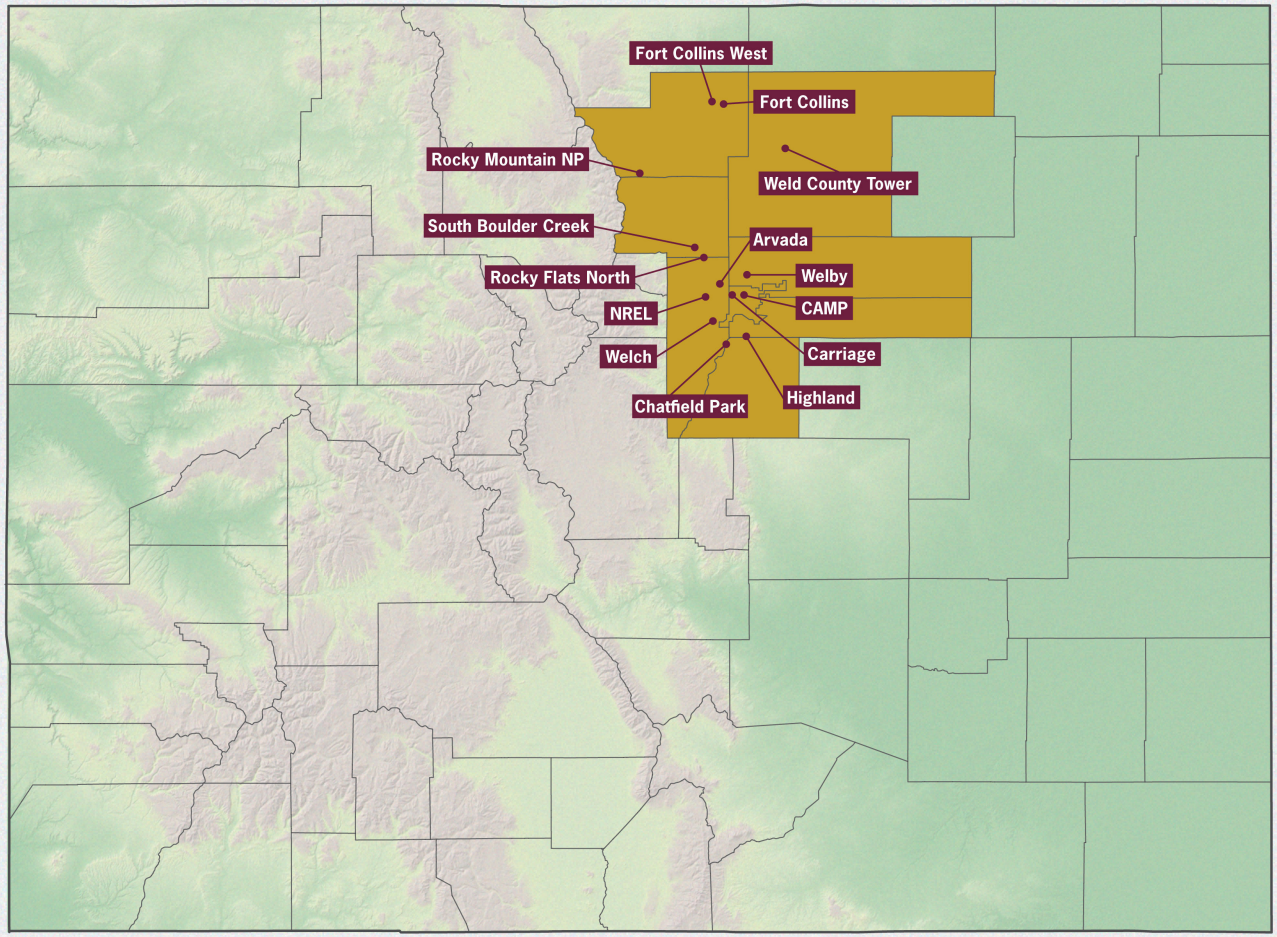
Denver-Boulder-Greeley-Fort Collins, Colorado
Eight-Hour Ozone Control Area

DRCOG
Denver Regional Council of Governments
Metro Vision Resource Center

June 2004

NAA Boundary

Non-Attainment Area



Denver Metro Area/North Front Range

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Condensate Tank Controls

- APCD proposed threshold approach,
  - emission control devices on all tanks ≥ 2 tpy of actual uncontrolled emissions – high incremental costs of approx. $1,400 to $14,000 per ton.
- Parties reached compromise with other stakeholders, then APCD:
  - retain system-wide approach;
  - increase control requirements:
    - 81% system-wide control beginning May 1, 2009;
    - 85% system-wide control beginning May 1, 2010;
    - 90% system-wide control beginning May 1, 2011.
- 95% control deferred for possible future consideration.

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Incremental Cost for VOCs Emission Reductions ($/year) For Each Tank Threshold

Tank Emission Levels	Incremental Reduction in Emissions of VOCs (Tons) @ 95% Reduction	Cost Per Ton of VOCs ($/ton)
> 5	78,310	
4 to 5	1,569	$1,497
3 to 4	1,071	$1,894
2 to 3	765	$2,612
1 to 2	391	$4,578
< 1	146	$14,426

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Condensate Tank Controls for First 90 Days

- AQCC adopted a measure, effective February 1, 2009, requiring:
  - Installation of an ECD on new or modified tanks for the first 90 calendar days from when a tank is newly installed or a well was newly drilled *or modified*.

- After first 90 days, may remove the ECD if demonstrate the source complies with the system-wide standard.

Definition of Modification

- AQCC adopted a new definition of modification:
  - includes *any* physical change that results in an increase in VOC emissions from the previous calendar year;
  - includes drilling new wells and routing production to an existing tank, and also includes re-completing, re-fracing or otherwise stimulating existing wells where the prior definition is satisfied.
  - This triggers the “first 90 days” control requirement.

Electronic Surveillance Systems ("ESS")

- RAQC/APCD proposed:
  - ESS on all tanks with actual uncontrolled emissions ≥ 2 tpy;
  - Flare temperature reading every 15 minutes (in addition to requiring auto-igniters on all new and existing wells with flare ECDs).
- APCD later revised its proposal pre-hearing:
  - ESS on all tanks ≥ 100 tpy;
  - flare temperature reading every hour.
- Parties argued for flexibility:
  - allow daily human inspections *or* ESS

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ESS cont.

- AQCC adopted broad definition of surveillance:
  - Daily human inspections; or
  - ESS with *at least daily readings*
  - on condensate tanks with actual uncontrolled emissions ≥ 100 tpy
  - Effective May 1, 2010.
- ESS Pilot Program
  - Anadarko Petroleum, Noble Energy and EnCana to work with the APCD
  - Each will install ESS on 20 tanks, study and report.

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Auto-Igniters

- APCD proposed requiring installation of auto-igniters on all new *and existing* tanks with flares by May 1, 2009.
- AQCC adopted a compromise:
  - Install auto-igniters on existing tanks ≥ 50 tpy by May 1, 2009, and all remaining tanks by May 1, 2010.
- For new/modified tanks:
  - Auto-igniter must be installed and operational beginning the first date of production, eff. 5-1-09.

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Responsible Officer Certification

- APCD proposed to require every report submitted pursuant to Reg. No. 7, Section XII be certified by a responsible corporate officer ("RO").

- Compromise reached to require RO certification on just the semi-annual and annual reports submitted under Reg. No. 7, Section XII.

Division Approved Spreadsheet

- AQCC adopted the APCD's proposal to require a "Division approved spreadsheet" for Reg. No. 7 reporting.
- Standardized spreadsheet will help APCD to determine compliance under the system-wide approach.
- APCD has not yet indicated what this "Division-approved spreadsheet" will look like.

30 Ton-Per-Year Exemption

- APCD proposed to eliminate the 30 ton-per-year exemption currently found in Reg. No. 7 Section XII.A.8.
- This exempted an owner/operator whose APENs for all condensate tanks totaled less than 30 tpy from the Reg. No. 7 Section XII requirements.
- AQCC retained the current 30 ton-per-year exemption without modification

Revisions to Regulation No. 3

Eliminated APEN exemptions for:

- Certain petroleum industry flares with uncontrolled emissions of any pollutant of than less than 5 tpy.
- Specified crude oil truck loading equipment at exploration and production sites.
- Produced water tanks containing equal to or more than 1% by volume crude oil on an annual average.
- Crude oil storage tanks with a capacity of 40,000 or less.
- Condensate tanks with a production rate of 730 barrels per year or less.

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Revisions to Regulation No. 3

Eliminated Construction Permit Requirements for Certain Facilities:

- Certain petroleum industry flares with uncontrolled emissions of any pollutant of than less than 5 tpy.
- Specified crude oil truck loading equipment at exploration and production sites.
- Oil and gas produced water tanks, except for commercial wastewater facilities.
- Crude oil storage tanks with a capacity of 40,000 gallons or less.

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State-wide Engine Controls

- Applies to natural gas fired RICE constructed or relocated to Colorado from another state:
  - On or after July 1, 2007 for RICE > 500 HP
  - On or after January 1, 2008 for RICE 100 HP < 500
  - Anytime for RICE < 100 HP

State-wide Engine Controls

- Requires installation of specific after-market control technology by July 1, 2010.
  - Lean burns with manufacturer's name plate design rate > 500 HP require installation of oxidation catalyst.
    - Lean Burn = normal exhaust oxygen concentration of than 2% by volume, or greater
  - Rich burns with manufacturer's name plate design rate > 500 require installation of non-selective catalyst reduction ("NSCR") and an air-fuel ratio controller.
    - Rich Burn = Normal exhaust oxygen concentration of less than 2% by volume

See Reg. No. 7, Sections VII.E.3.A-B.

State-wide Engine Controls

$5,000 Exemption Available for:

- Engines constructed or modified before **February 1, 2009,** where it will cost more than $5,000 per ton of VOC reduced.
  - For rich burns, $5,000 per ton combined VOCs and NOx
  - For lean burns, it is $5,000 per ton VOCs reduced
- To obtain this exemption, owner/operator must submit application to the APCD by **August 1, 2009**.
  - Must provide supporting documentation
  - Costs should be supported by vendor quotes
  - Costs should be annualized in accordance with applicable EPA guidance.

See Reg. No. 7, Sections VII.E.3.A-B.

State-wide Engine Controls

MACT, BACT, and NSPS

- The state-wide engine controls do **not** apply if an engine is subject to:
  - federal MACT standard,
  - a BACT limit, or
  - a NSPS under 40 CFR Part 60, including NSPS Standard JJJJ

See Reg. No. 7, Sections XVII.B.4.

On-Going Regulatory Activities

- "NOx Forum" – Started New Stakeholder Process
  - Regional Haze, Reasonable Progress
  - RMNP Nitrogen Deposition
  - Ozone II
- State-wide condensate tank controls?
- State-wide pneumatic controls?
- Drill Rig Engine Emissions (NOx)?
- Modeling Meeting on February 4th at RAQC from 1:00 to 4:00

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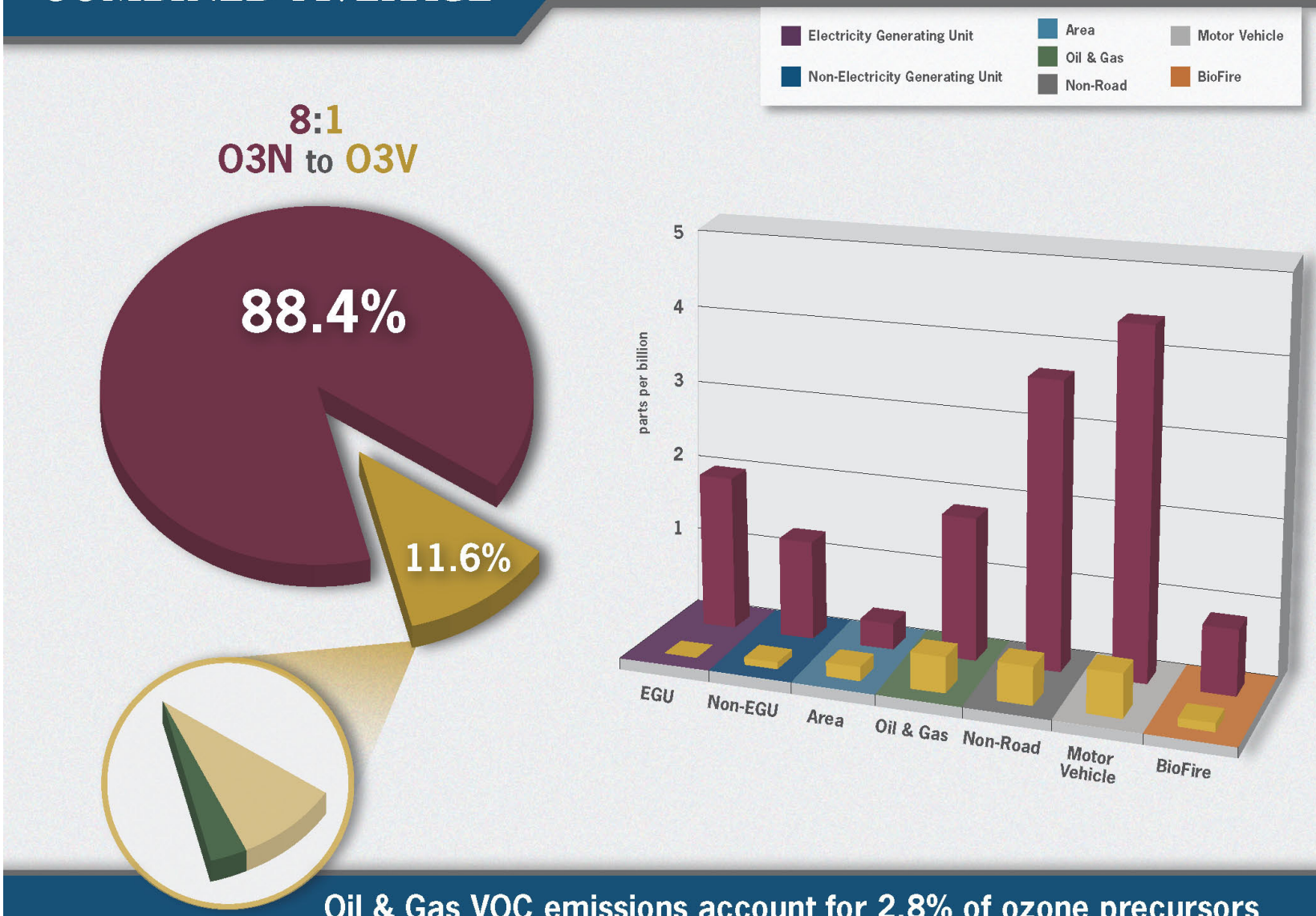
Combined Average



Oil & Gas VOC emissions account for 2.8% of ozone precursors