

PRELIMINARY RESULTS

MathPro Specialty Fuels Study for 8-hour Ozone NAAQS

For American Petroleum Institute

By MathPro Inc. and
Stillwater Associates LLC

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MathPro Study Phases

PRELIMINARY RESULTS

- Distribution infrastructure analysis
- Notional refinery economic analysis

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Distribution Infrastructure Phase

PRELIMINARY RESULTS

- Conducted detailed survey of industry infrastructure
- Analyzed distribution operations
- Projected likely spillover areas where distribution infrastructure was limited

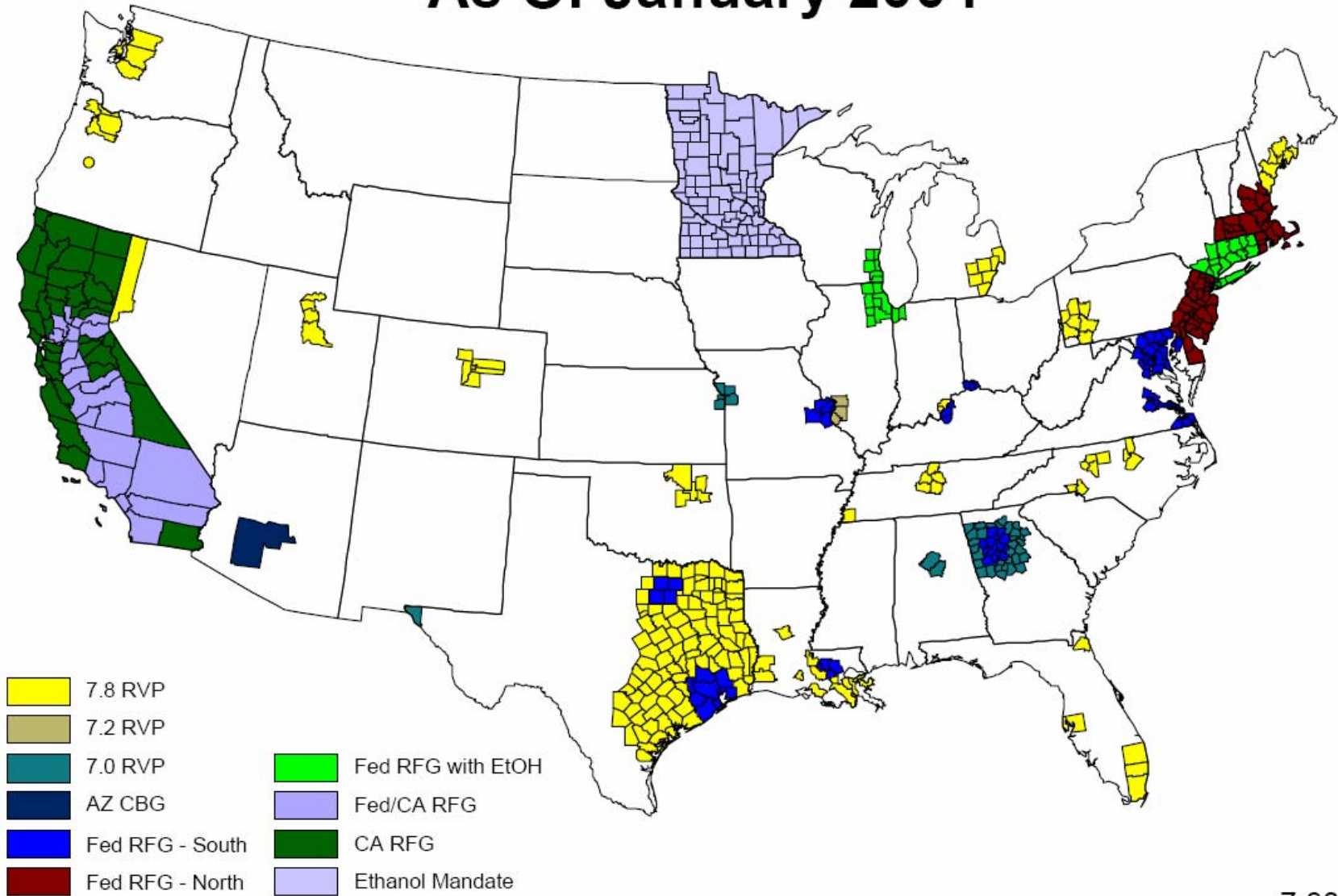
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Distribution Infrastructure Phase

PRELIMINARY RESULTS

- Projected new fuels controls
 - Each non-attainment area under the new 8-hour NAAQS would opt for the next most stringent fuel
 - 9.0 RVP would select 7.8 RVP
 - 7.8 RVP would select 7.0 RVP
 - 7.0 RVP would select RFG
 - Current RFG areas would continue with RFG

Exhibit 2.1: Summer Gasoline Programs, As Of January 2004



7-30-04
5

Exhibit 2.4: 8-Hour Ozone Standard Non-Attainment Areas, by Classification

3

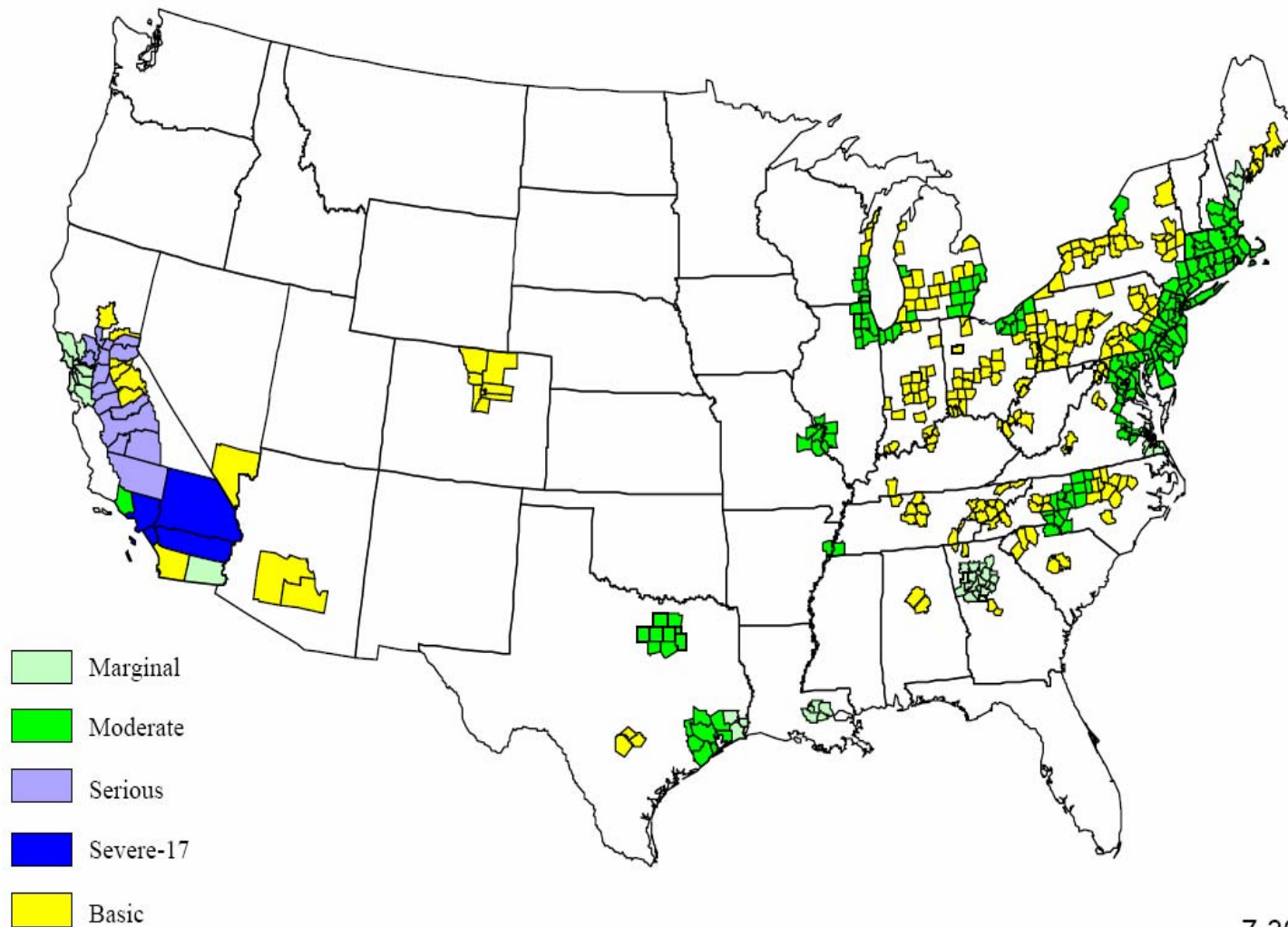
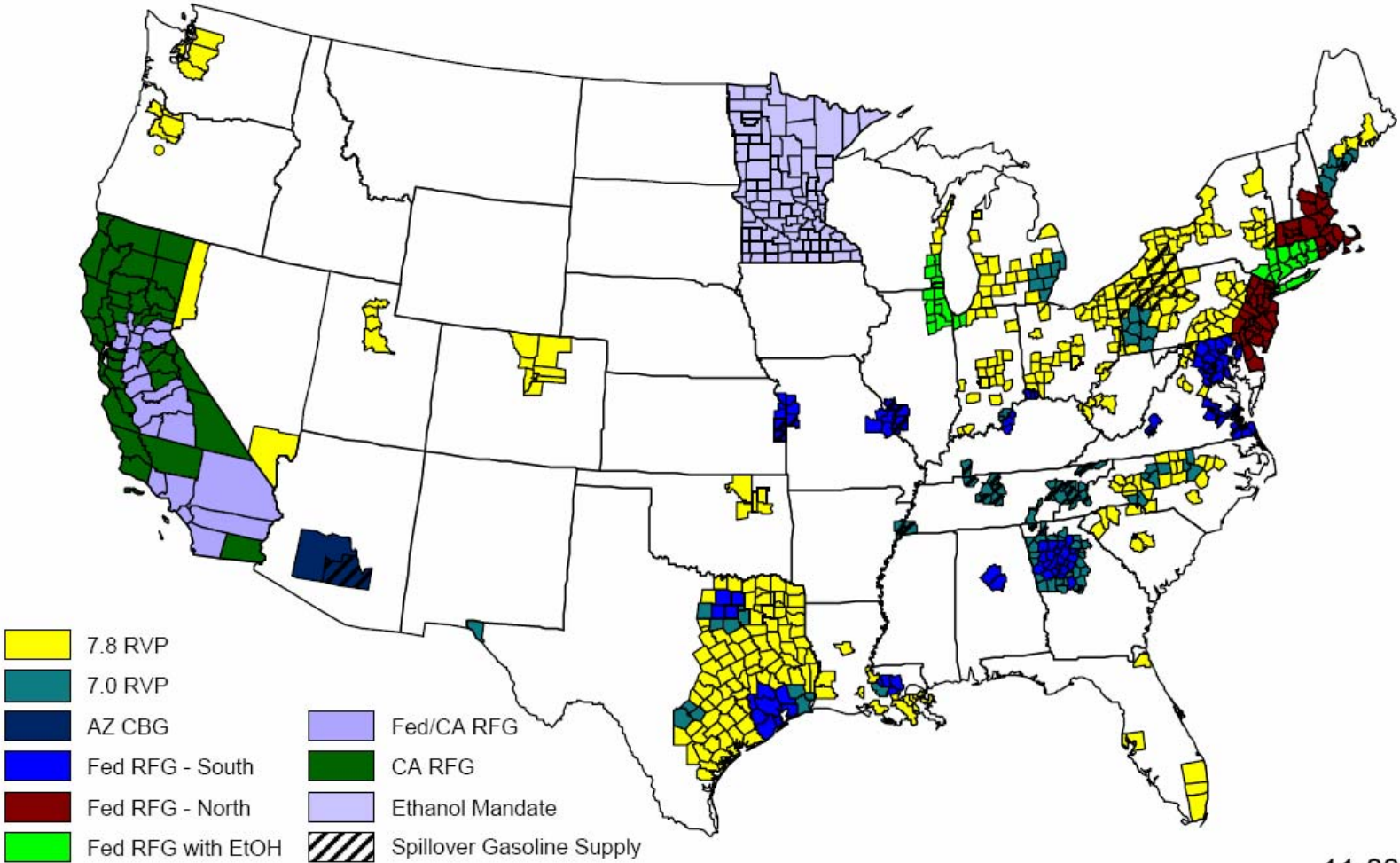


Exhibit 2.6: Projected Pattern of Special Gasoline Use, Summer 2008



11-03-04

Distribution Infrastructure Phase

PRELIMINARY RESULTS

- Findings:
 - If states select controls as assumed, the distribution system is generally capable of handling the projected new volumes of known specialty fuels
 - But, distribution system capabilities must be considered in selecting new fuels controls
 - States and Oil Industry should coordinate the implementation and timing of new fuels controls
 - A few areas present supply concerns

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Distribution Infrastructure Phase

PRELIMINARY RESULTS

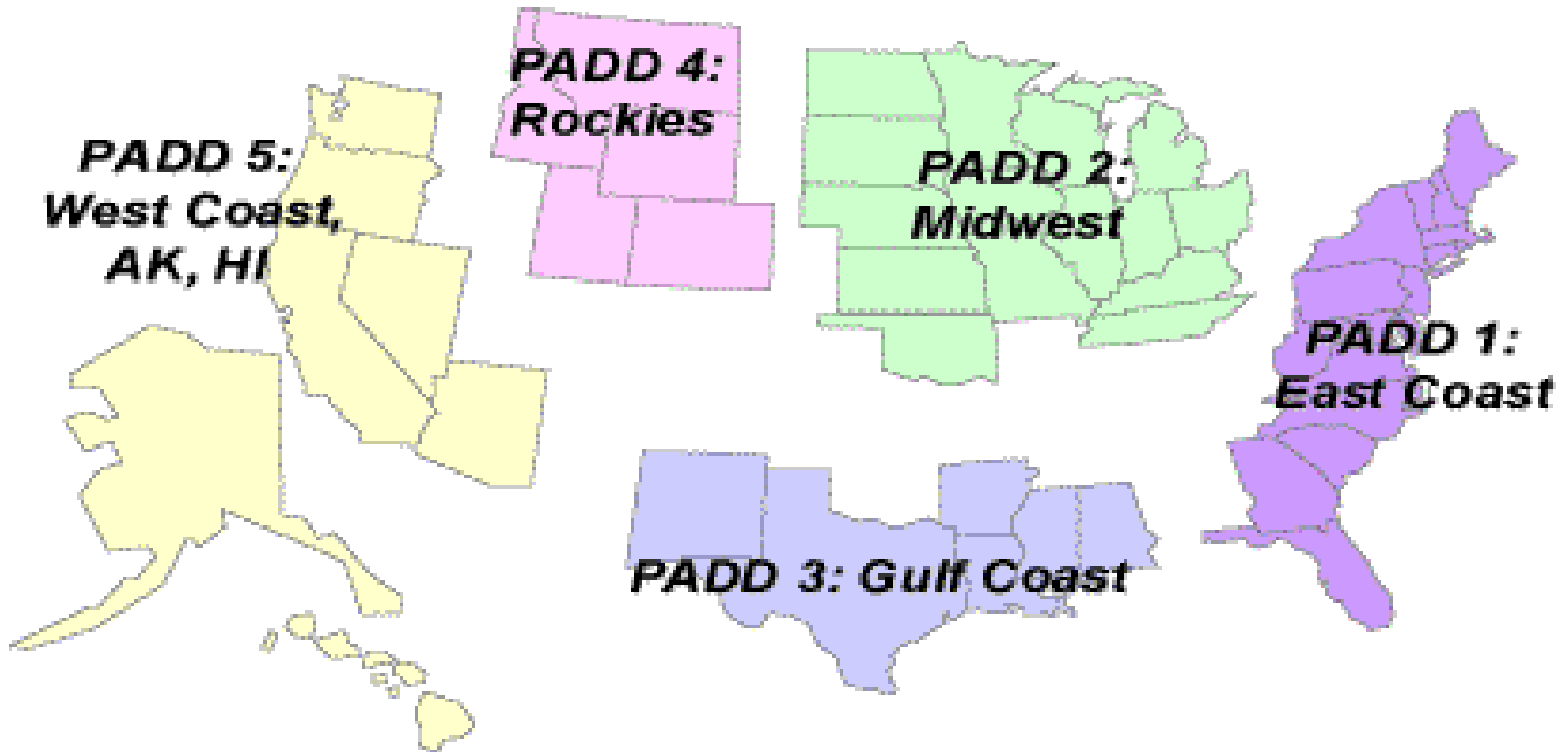
- Distribution Areas of Concern
 - 32 counties around Atlanta
 - Nashville and Knoxville
 - West Memphis
 - Roanoke, Va, Va Tidewater area, N. Va
 - Western Pa and NY
 - Kansas City
 - Three other locales: Albany, E. St. Louis, and Phoenix

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Notional Refinery Cost Phase

- Used MathPro notional refinery concept
 - Refinery configuration composite of PADD processes and size typical for the PADD of consideration
 - Refinery fuel production representative of PADD-average properties and fuel mix
 - Notional refinery by definition has greater flexibility than any one actual facility – tends to over optimization
- Notional refineries analyzed for PADDs 1, 2, and 3
- Analysis reflects PADD 3 supplies of significant volumes to PADDs 1 & 2

Petroleum Administration for Defense Districts



PADD'S CONTINUE TO BE USED BY EIA AND
MUCH OF THE US PRODUCTION AND DEMAND
DATA IS AVAILABLE BY PADD

Notional Refinery Cost Phase

PRELIMINARY RESULTS

- This is a modeling effort, and results may not reflect the specific capabilities and economics of individual refineries.
- However, the primary finding of the analysis seems directionally valid.
- Incremental refining costs are an increasing function of the volumes of specialty fuels produced by any specific refinery.
- Any fuel choice that is new and unique to the Mid-west region will compound and exacerbate supply concerns

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Notional Refinery Cost Phase

- Baseline was existing PADD mix
- For RFG, study estimated avg. cost to
 - Shift ½ 7.8 RVP production to RFG
 - Shift all 7.8 RVP production to RFG
 - Shift all non-RFG production to RFG
- For 7.0 RVP, study estimated avg. cost to
 - Shift ½ 7.8 RVP production to 7.0 RVP
 - Shift all 7.8 RVP production to 7.0 RVP
 - Shift all non-RFG production to 7.0 RVP

Notional Refinery Cost Phase

PRELIMINARY RESULTS

- Average incremental costs vary widely, depending mainly on the volume share shifted to specialty fuels.
- Other factors also influence refining costs.

	RFG	7.0 RVP
PADD 1	1.3-13 cpg *	0.7-2.4 cpg *
PADD 2	1.7-6.2 cpg *	0.6-3.0 cpg *
PADD 3	4.1-9.3 cpg *	0.7-3.1 cpg *

* CENTS PER GALLON

PUBLISH

SEMCOG-Specific Gasoline Supply Considerations

- The MathPro study did not consider SEMCOG-specific issues. These comments do not reflect findings of the study, but simply delineate known industry capabilities.
- If SEMCOG adopts a new fuel,
 - The single Detroit refinery will likely have to produce 100% new SEMCOG fuel
 - The two Toledo refineries will have to make significant volumes of new SEMCOG fuel

SEMCOG Specific Gasoline Supply Considerations

- Chicago refineries, which already produce significant volumes of RFG, currently also supply the SEMCOG area.
- PADD 3 refineries supply significant RFG volumes to the Chicago/Milwaukee area.
- PADD 3 refineries would likely be incremental suppliers of RFG to any PADD 2 non-attainment areas that opt into additional RFG.