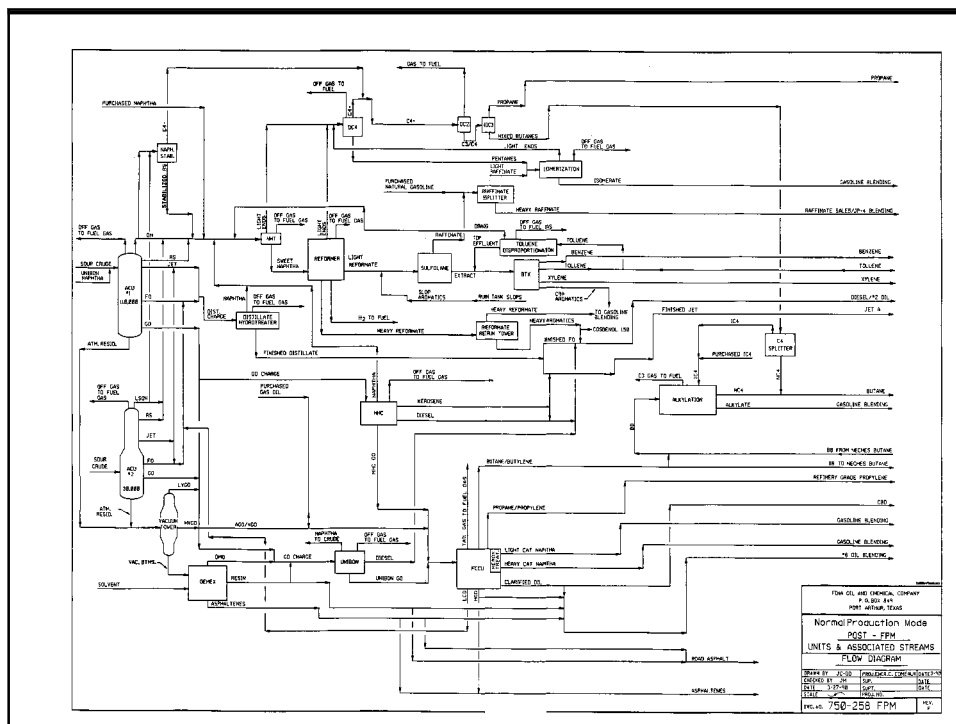


Challenges Facing the Domestic Fuels Industry

Bob King and Mike Kulakowski
MSTRS Meeting
1/12/00

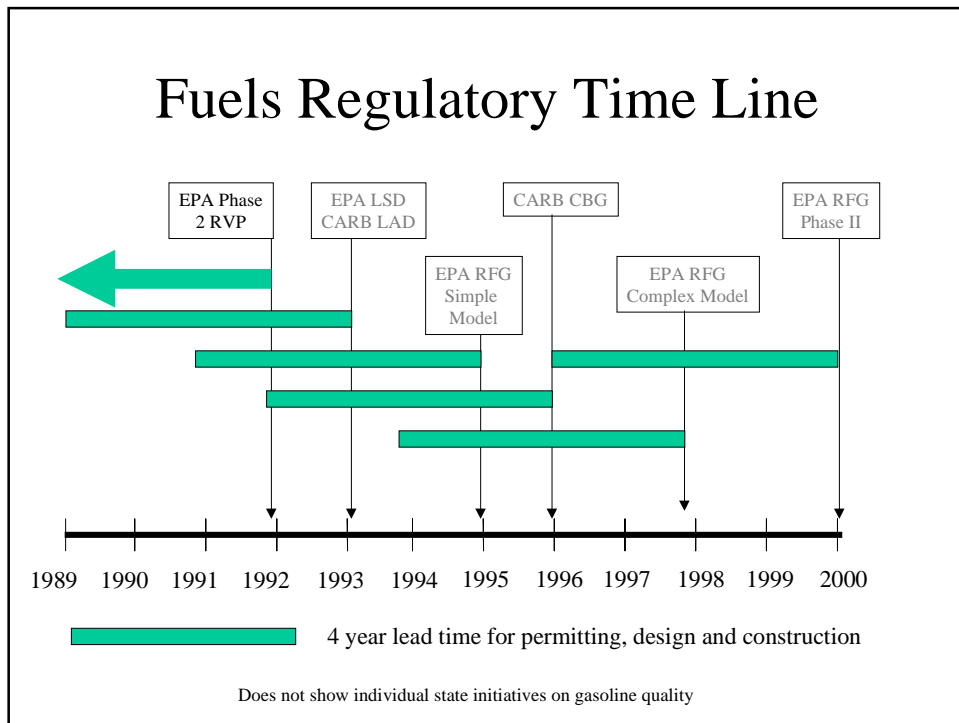
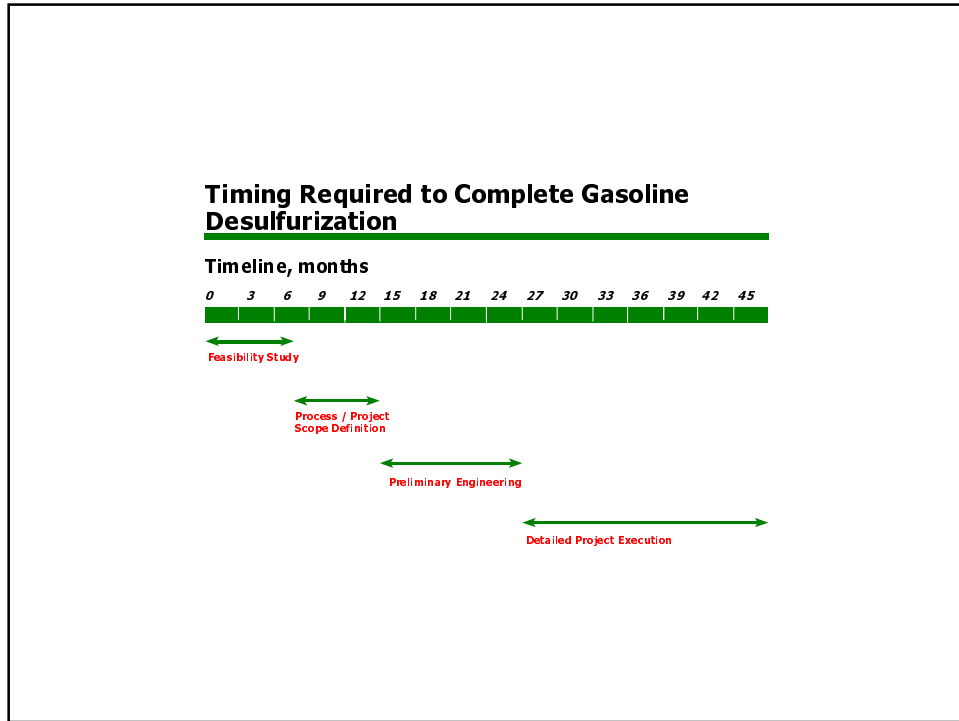
Topics

- Introduction to Refining
- Permitting and Construction
- Regulatory History and Future
- Cost Estimates
- Financial History
- Reality Check
- Recommendations



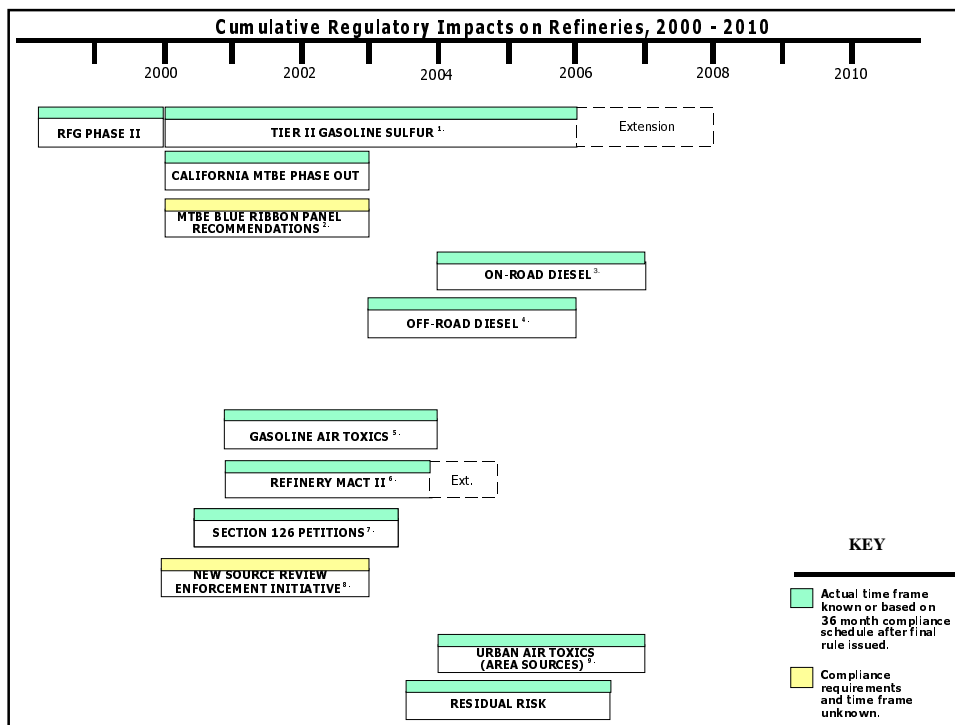
Introduction to Refining The “4 Bs”

- Boiling
 - Distillation -- the basic separation process
- Breaking
 - Cracking processes -- Fluid Catalytic Cracking (FCC), Hydrocracking and Coking
- Bending
 - Rearranging molecules -- alkylation, isomerization
- Blending
 - Putting it all together while meeting specifications economically



Differences Between Past and Future Regulations

- Nature of regulations
 - Most prior regulations did not impact all production (i.e. participation was selective)
 - Fewer participants -- less demand for equipment
 - Participation decided on an economic basis
 - Upcoming regulations DO impact every gallon
 - All refiners must participate regardless of economics
- Stringency of regulations
 - Operability impacts

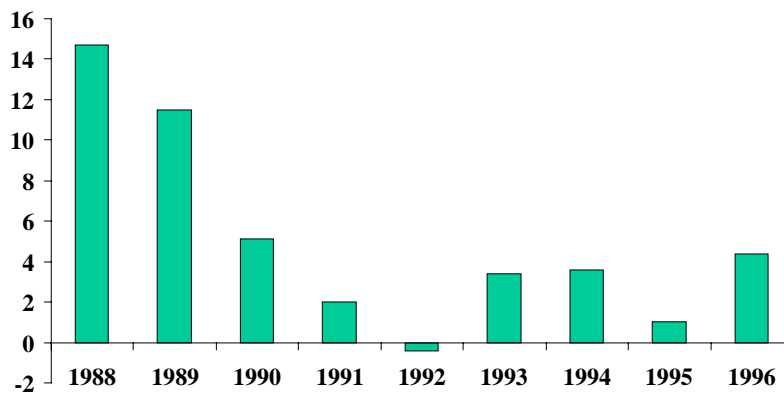


Cost of Future Fuel Requirements

Program Description	Effective Date	Capital Cost (\$B)
EPA Gasoline Sulfur	2004-6	4-7
EPA Low Sulfur Diesel (on-road)	2004-8?	4-8
EPA Low Sulfur Diesel (off-road)	2002-8?	1-2
California MTBE Removal/Phase 3 RFG	2002	0.2 – 1.0
Blue Ribbon Panel Recommendations	?	?
Mobile Source Air Toxics	?	?
Refinery MACT	2001-4	?
126 Petitions	2000-3	?

Industry is facing massive regulatory project investments

Refining and Marketing Financial Returns



Source: EIA Form 28

Regulatory Reality Check

- Deliverability of very low sulfur fuels in commingled systems
- Technology demonstration
- Need near-perfect refining operations
- Permitting
- Resource availability
- Unanticipated outcomes

Gasoline Desulfurization Commercial Experience

Licensors	Commercial Units
Mobil (Octgain)	1
CDTech (CDHDS)	0
Phillips SZorb	0
Black and Veatch (IRVAD)	0

BUILDING TRADES MANPOWER SHORTAGE

- CII STUDY shows 75% of Constructors have shortages
- Business Roundtable Construction Committee survey of members showed 25% of projects have cost increases & schedule delays due to labor shortfall.
- Shortages are as common in non-union as in the union sector.
- Both the Quantity and Quality are suffering.
- Not a local problem; national in nature.
- Will not go away quickly.

BUILDING TRADES MANPOWER SHORTAGE

WHY?

- Current Economic Boom & Commercial Development
- Construction Craft Retirements are outpacing new apprentice enrollments - Numbers are decreasing.
- Construction cannot attract high school graduates in sufficient numbers - Poor Image.
 “Young people see it as dirty, uninteresting work done in bad weather.”
- Some are of the opinion wages are not high enough to attract.

Key Regulatory Needs

- Fuels regulations in series, not parallel
- Recognition of “reality check” items in regulatory development
- A road map that does not change
- REAL flexibility in fuels rules
- Recognition that the refinery and distribution network are systems facing simultaneous compliance with many rules

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