



Fuel Quality Strategy

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United Nations Environment Programme

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After phase-out

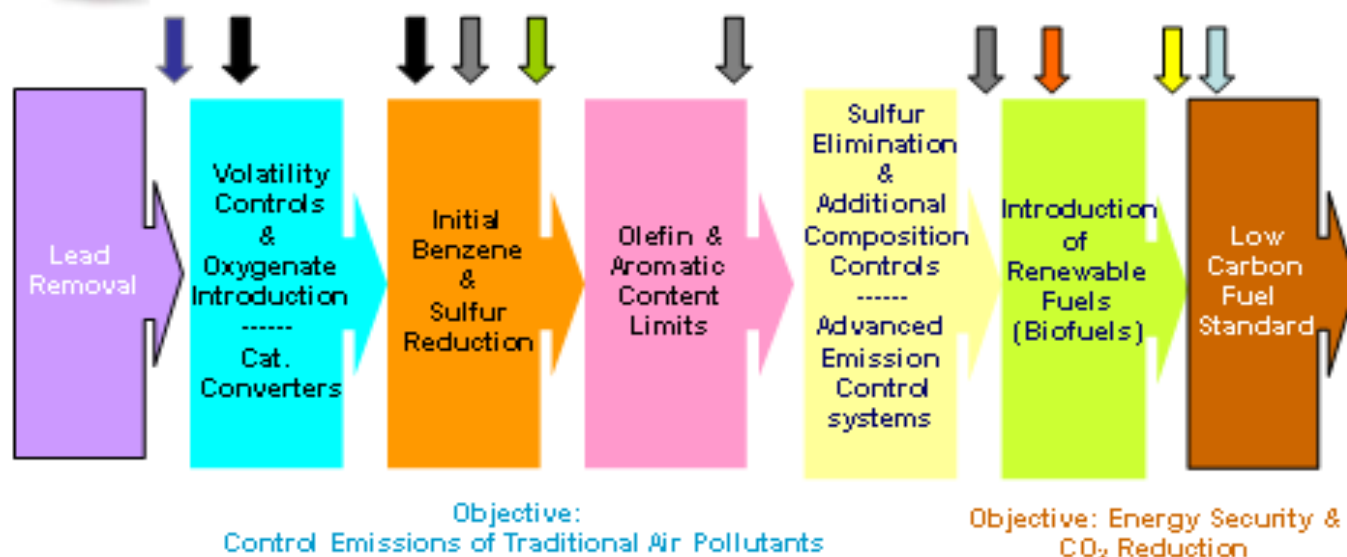
To recap.....other important issues include:

- Sulfur in fuels
- Clean vehicles technologies
- Clean vehicles
- Urban air quality monitoring
- Emission measurement





Global Fuel Quality Developments



Current Status

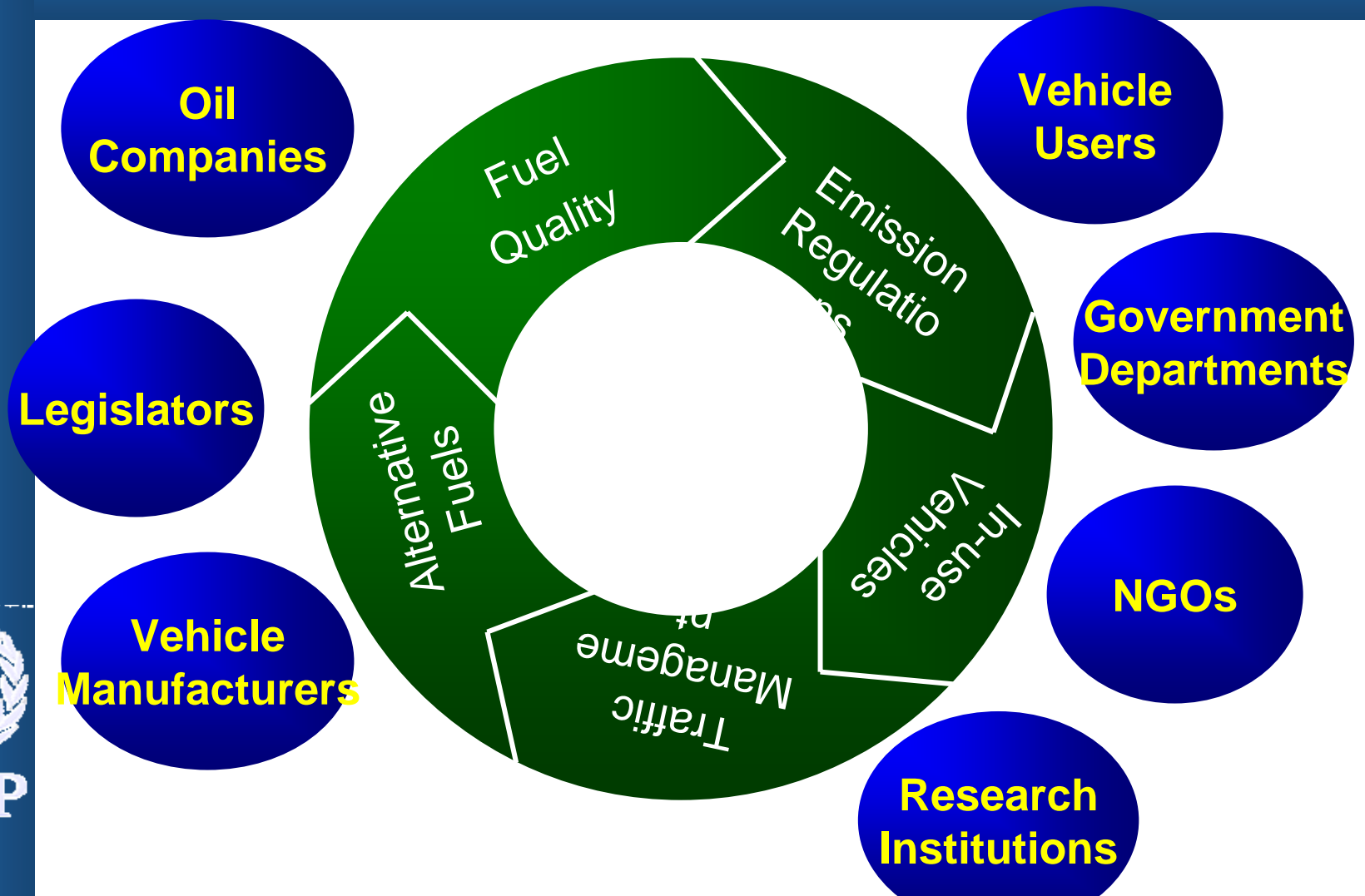


Source: *Institutional Fuel Quality Center 2008*





Air Pollution Management





The World's leading Auto Oil Programs

Year	89	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07
USA			AQIRP				AQIRP II			DECSE					APBF-DEC				
EU							Auto Oil I			Auto Oil II					CAFE				
JAPAN										JCAP I					JCAP II				

AQIRP: Auto/Oil Air Quality Improvement Research Program ,

DECSE: Diesel Emission Control Sulfur Effect

APBF-DEC: Advanced Petroleum Base Fuel-Diesel Emission Control, CAFÉ: Clean Air For Europe, JCAP: Japan Clean Air Program

□ Auto Oil Programs: solve urban air quality/environmental/health issues:

- **US (Clean Air Act 1970,1990):** AQIRP (1989) Objective: find immediate solutions by optimizing fuel quality using available refinery components in the existing vehicle fleet.
- **EU (Auto Oil I 1991, II 1996) & Japan (JCAP I 1996, II 2001):** Objective: to create tailored made solutions to growing transport air quality problems based on different country climates, air quality problems, vehicle fleets, driving conditions using systems approach

□ **Result: comprehensive air quality targets, emissions and fuel quality legislation**

□ **Lessons learnt adapted & applied successfully globally**





Key Lessons Learnt

Vehicle technologies and fuel systems have to be developed as one system to solve emissions problems

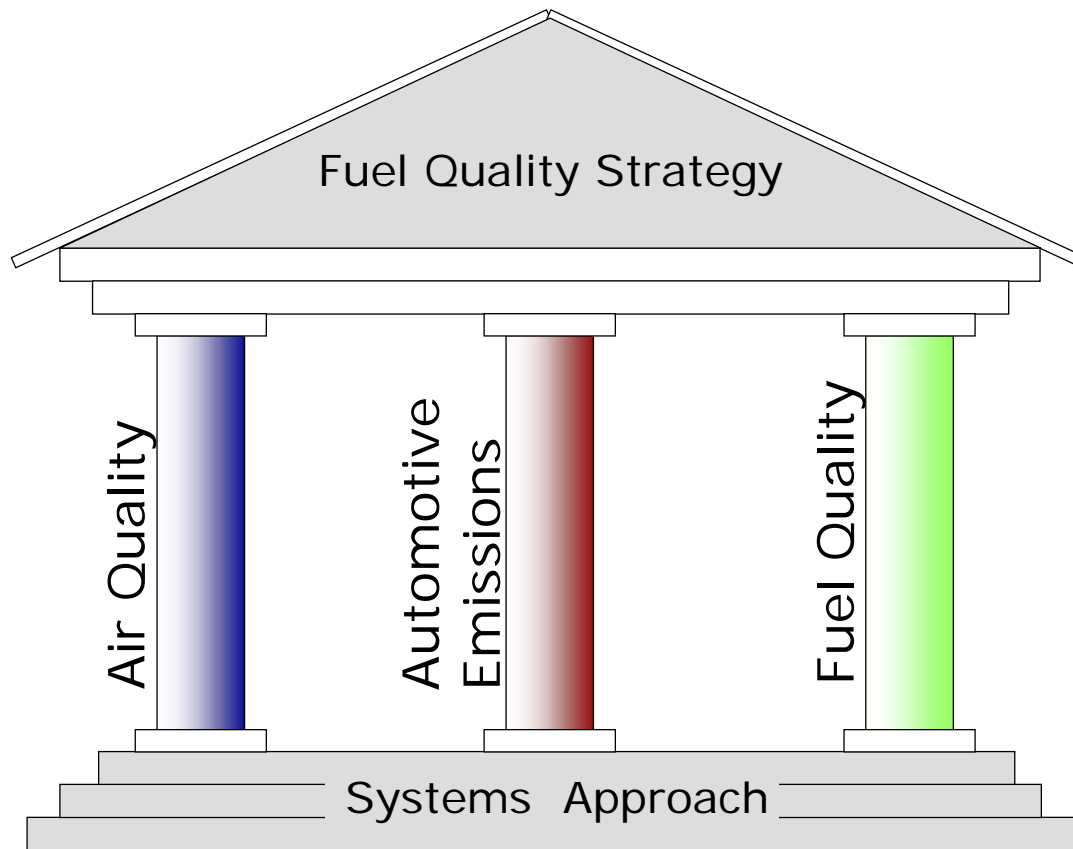
The real benefits of fuel quality changes are achieved when they are used to enable new vehicle technologies

Lead phase-out of gasoline has the largest benefit, with the next focus areas being reduction of sulfur, Reid Vapor Pressure (RVP), benzene and aromatics content

Sulfur reduction is the primary focus with regard to diesel. Specification requirements that have an influence on particle formation follow closely, such as total aromatics and PAH, the final boiling point and the cetane number

Fuels with an effective additive package are considered essential for operating both gasoline and diesel vehicles more efficiently. The benefits include cleaner combustion, fewer deposits on the valves, in the combustion chamber, less wear and tear, protection against corrosion and reduced fuel consumption.

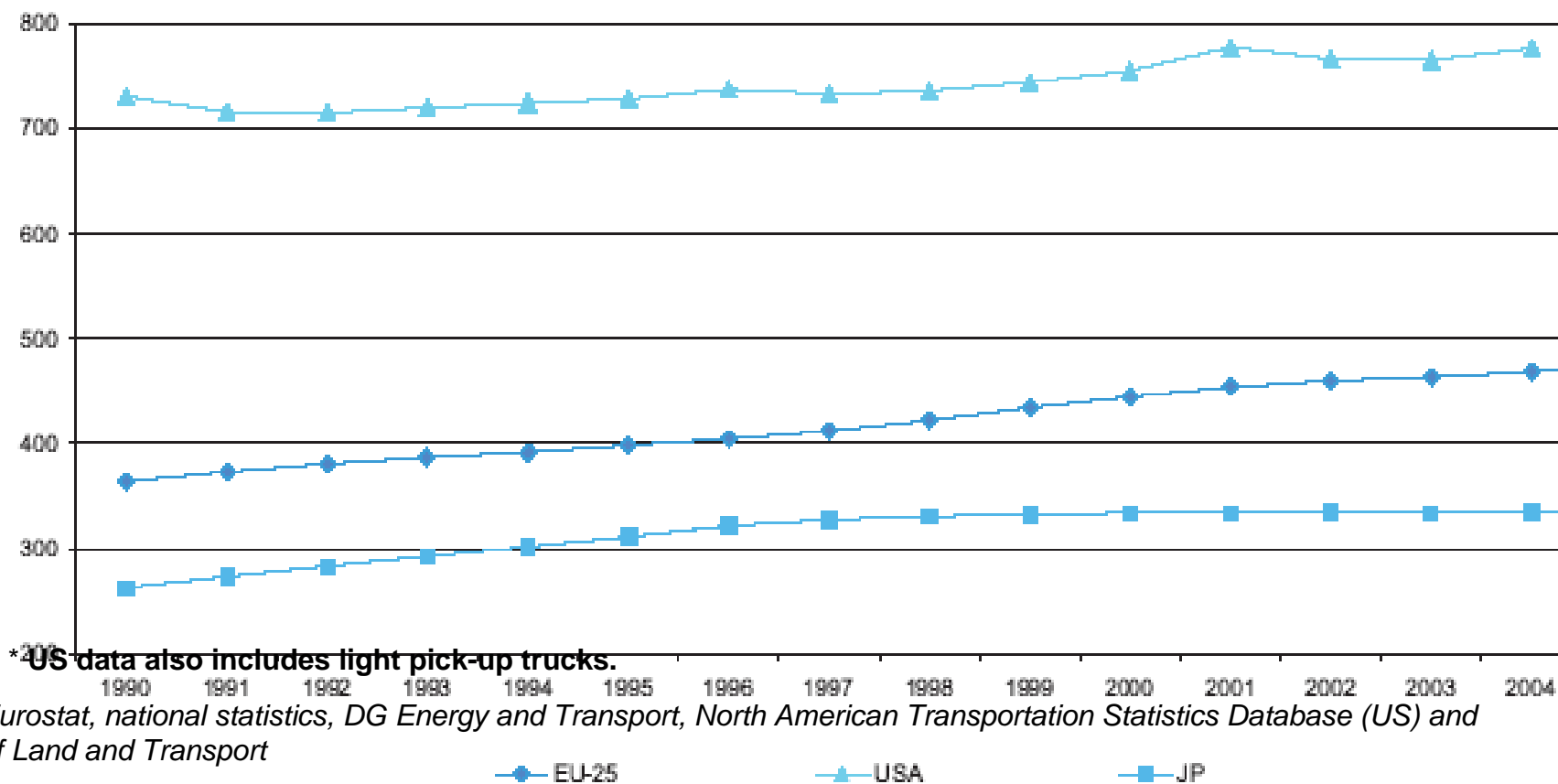
The Systems Approach to Fuel Quality Management



Source: International Fuel Quality Center (IFQC), 2003.



Evolution of the Motorisation Rate EU 25, USA & Japan (per 1000 inhabitants)



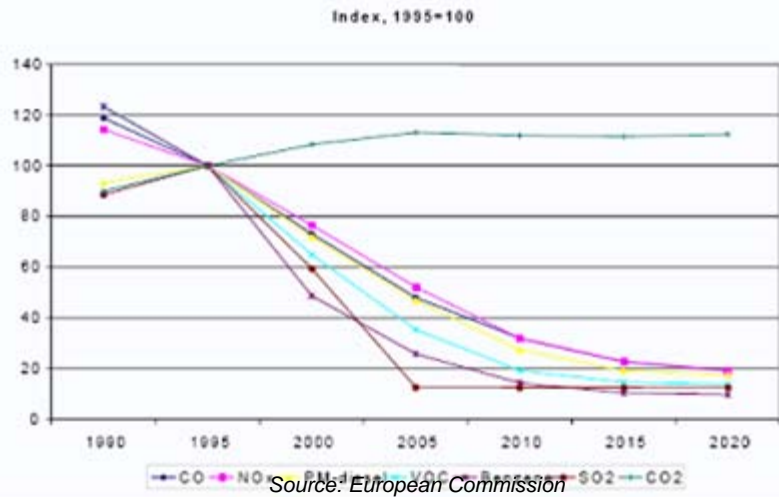
*US data also includes light pick-up trucks.

Source: Eurostat, national statistics, DG Energy and Transport, North American Transportation Statistics Database (US) and Ministry of Land and Transport

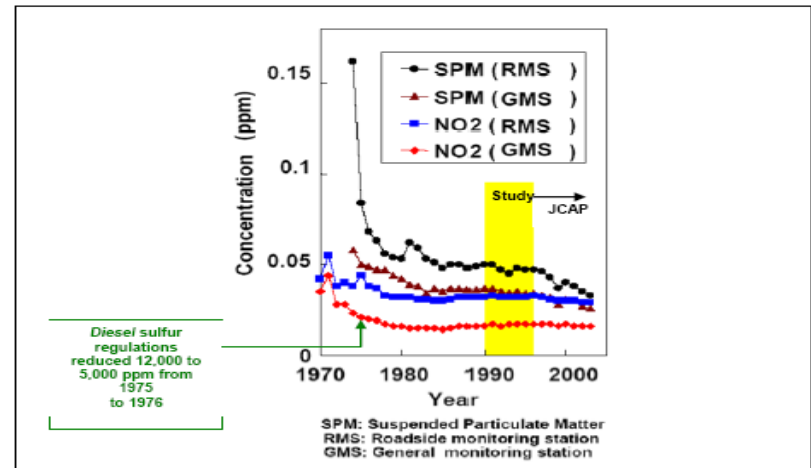


Auto Oil Program Results

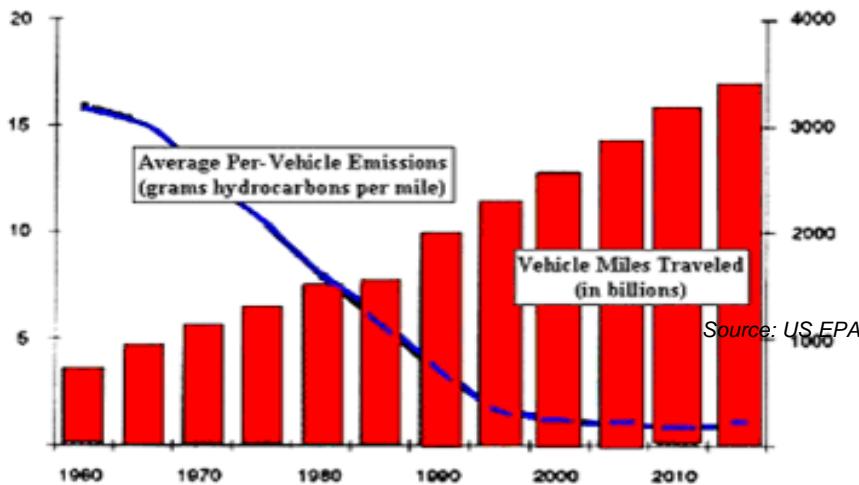
Europe: Emissions of Primary Pollutants (except CO2) Reduced



Japan: Air Quality Monitoring Results 1970-2005

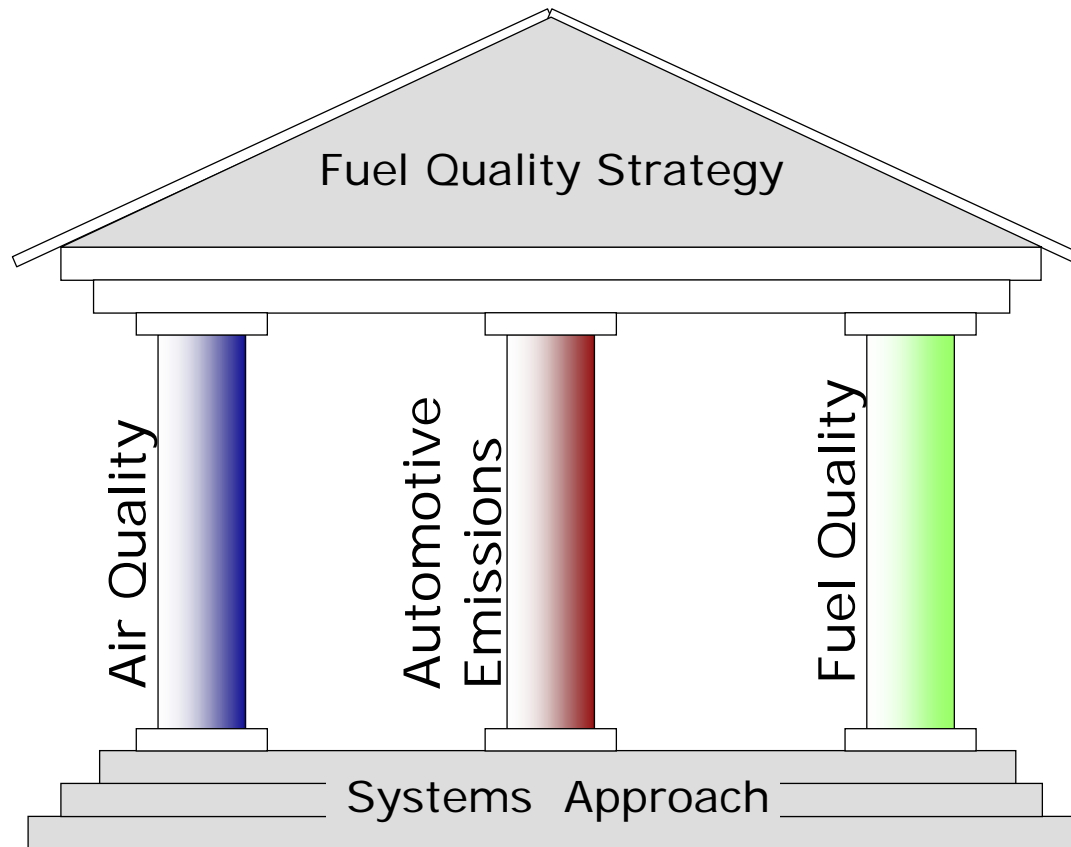
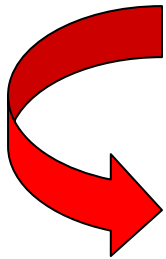


Source: JCAP



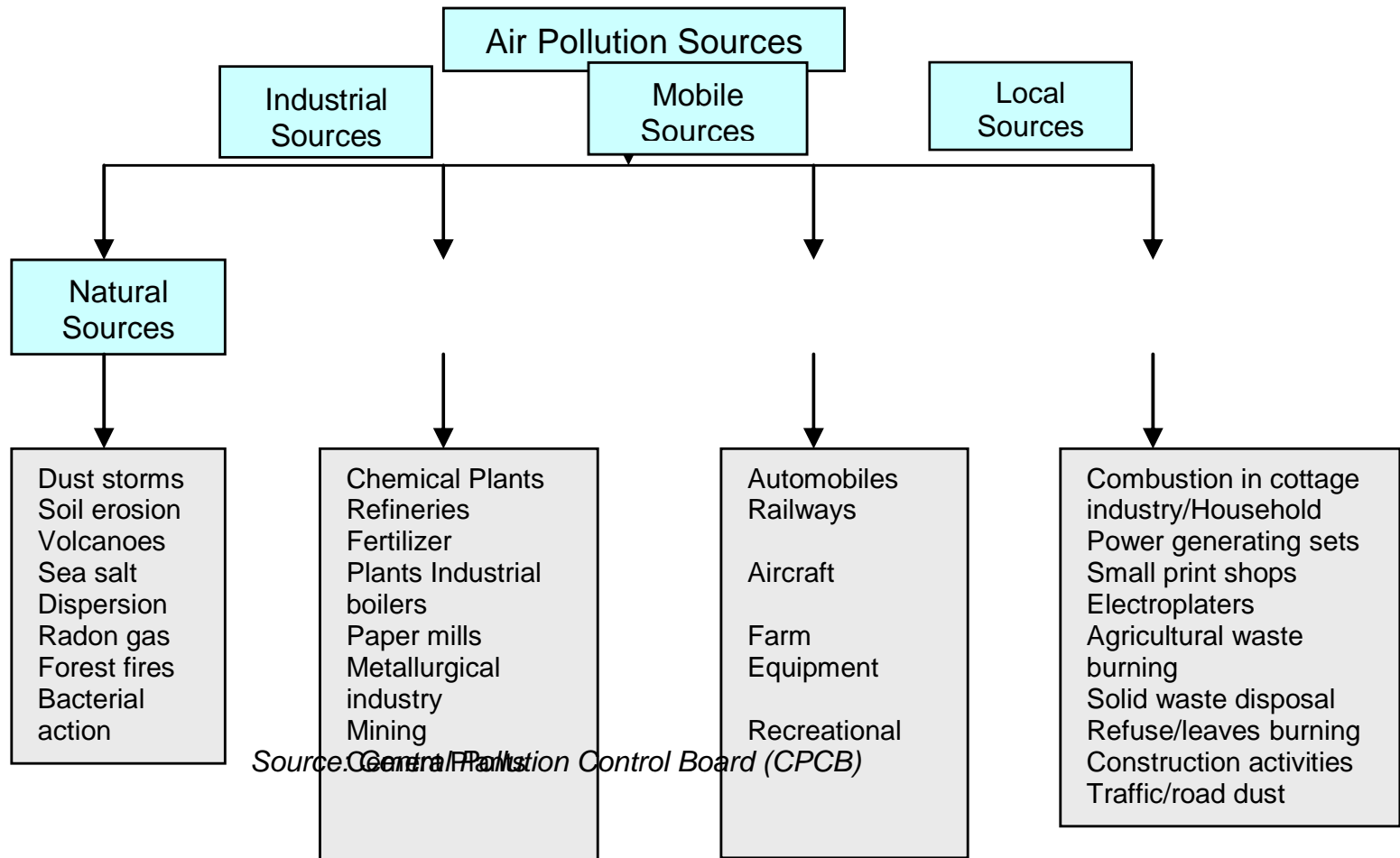
USA: Emissions per Vehicle reduced while miles traveled increased

Source Apportionment





Source Apportionment





Air Quality Management Strategy

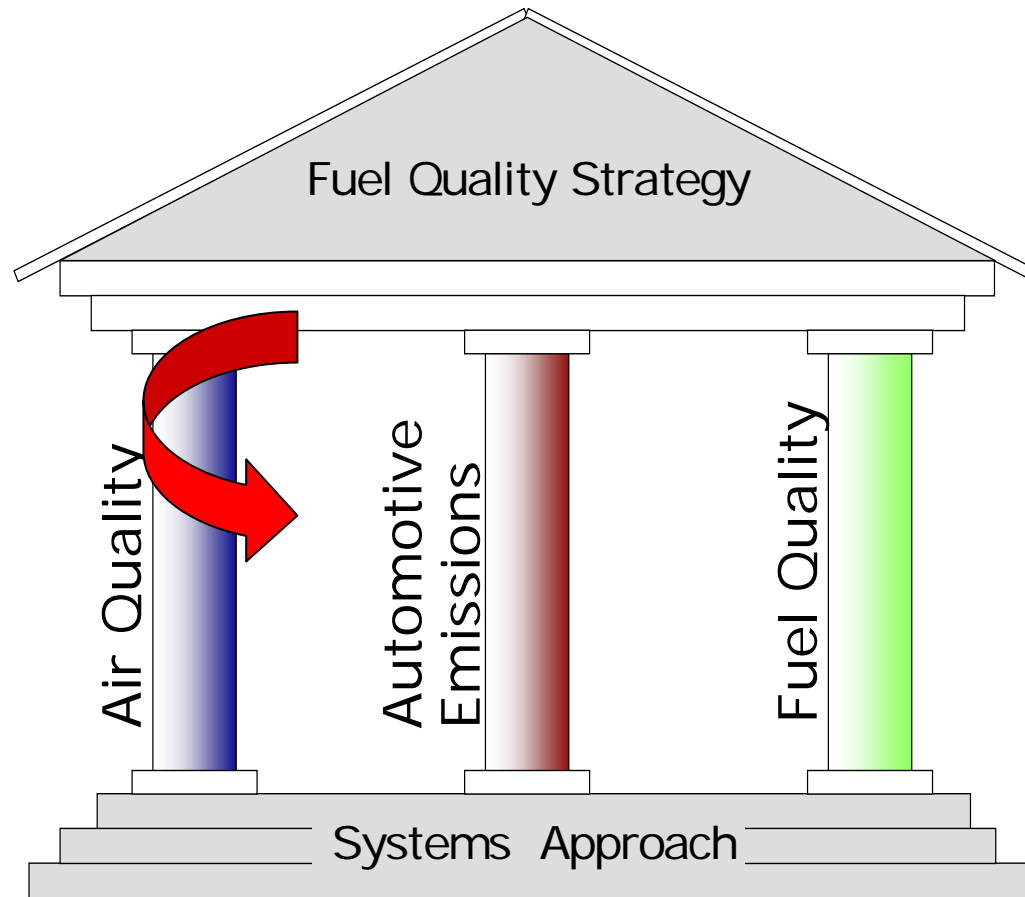
Technical: Implementing cleaner production and pollution prevention technologies and best practices

Regulatory: Developing, implementing and enforcing laws governing sources

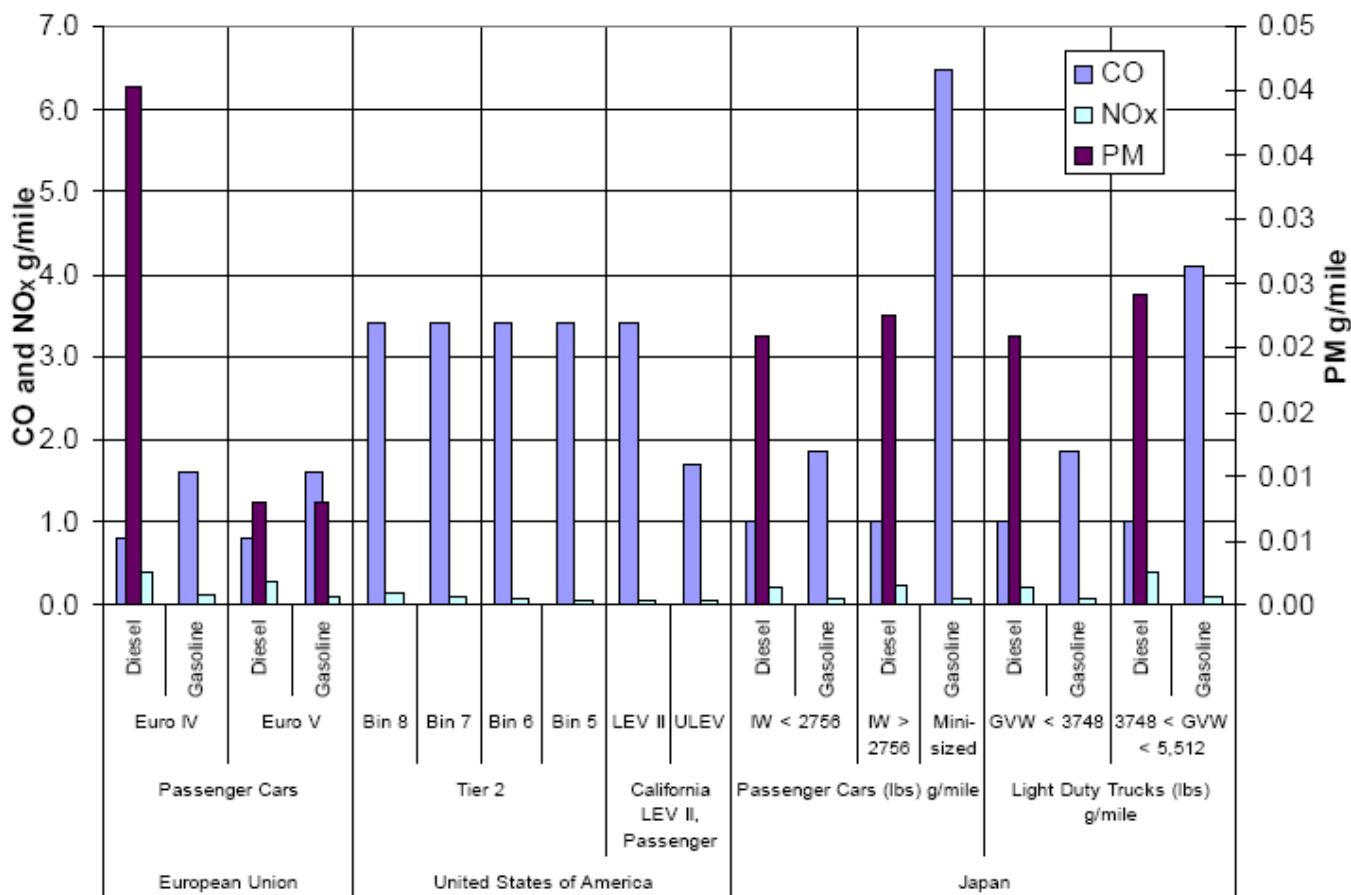
Educational: Informing the community about sources of emissions, impact of emissions and how to personally curb emissions

Market Based: Applying financial incentives or disincentives through application of market controls

The Second Pillar: Automotive Emissions



Qualitative Comparison of Emissions Standards

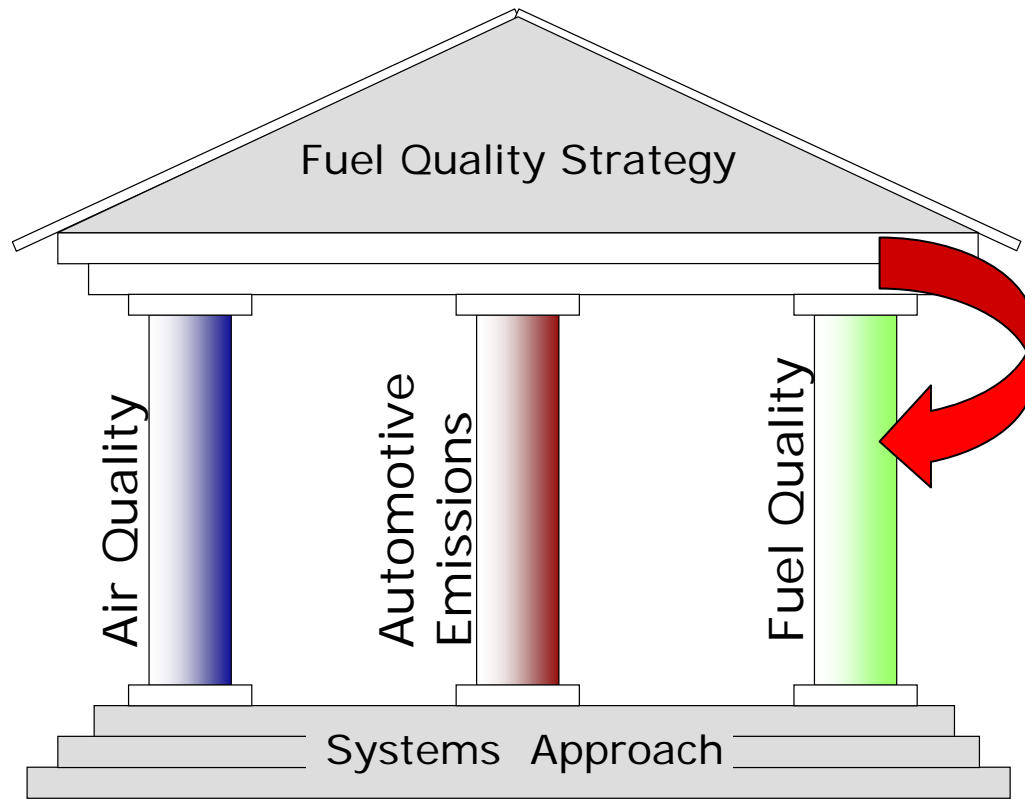


Note: Each region is using different drive cycles and testing and measurement procedures
 IW – Inertial weight, GVW – Gross vehicle weight
 PM limits for the Tier 2 and California LEV II vehicles standards are those defined for the useful life of the vehicle



Source: Internati

The Third Pillar: Fuel Quality



Source: International Fuel Quality Center (IFQC), 2003.



Fuel Quality Strategy: General Approach

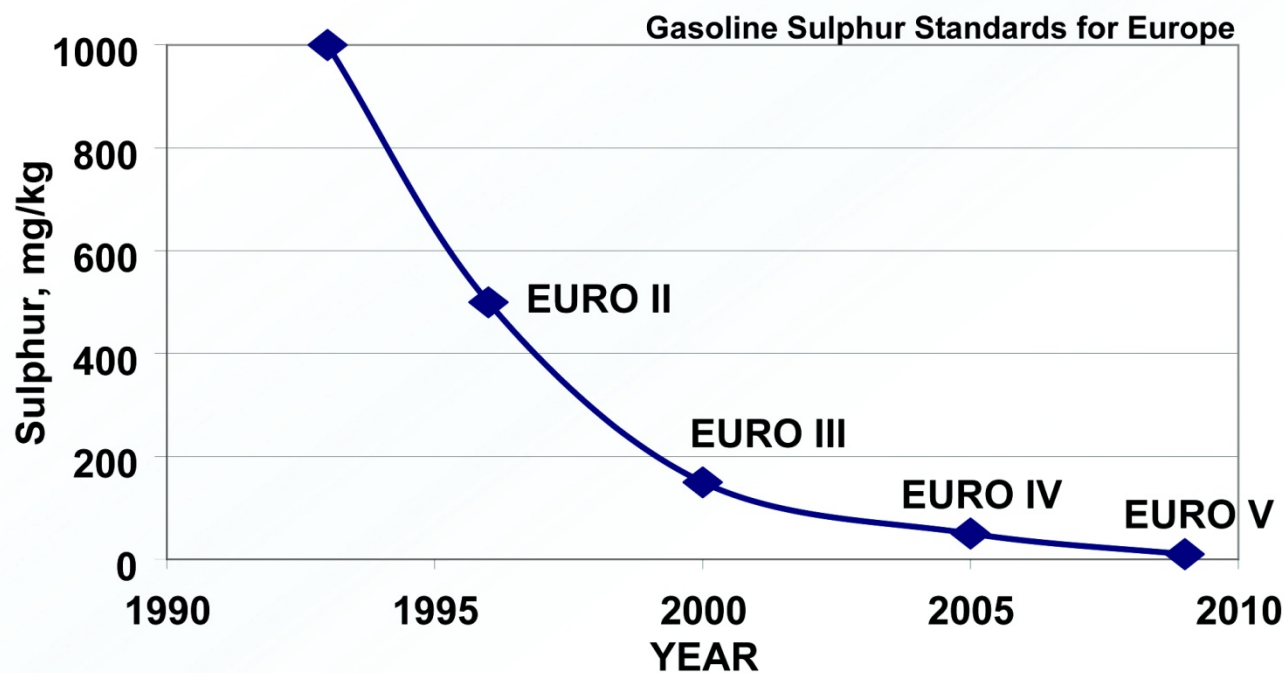
Context related: those blocks which set the back drop and put the strategy into context such as environment and health data, industrial realities etc.

Process related: those blocks which are related to the process of developing a fuel quality strategy such as creating a stakeholder dialogue and ensuring that links are made with other relevant policies e.g. energy security, climate change etc.

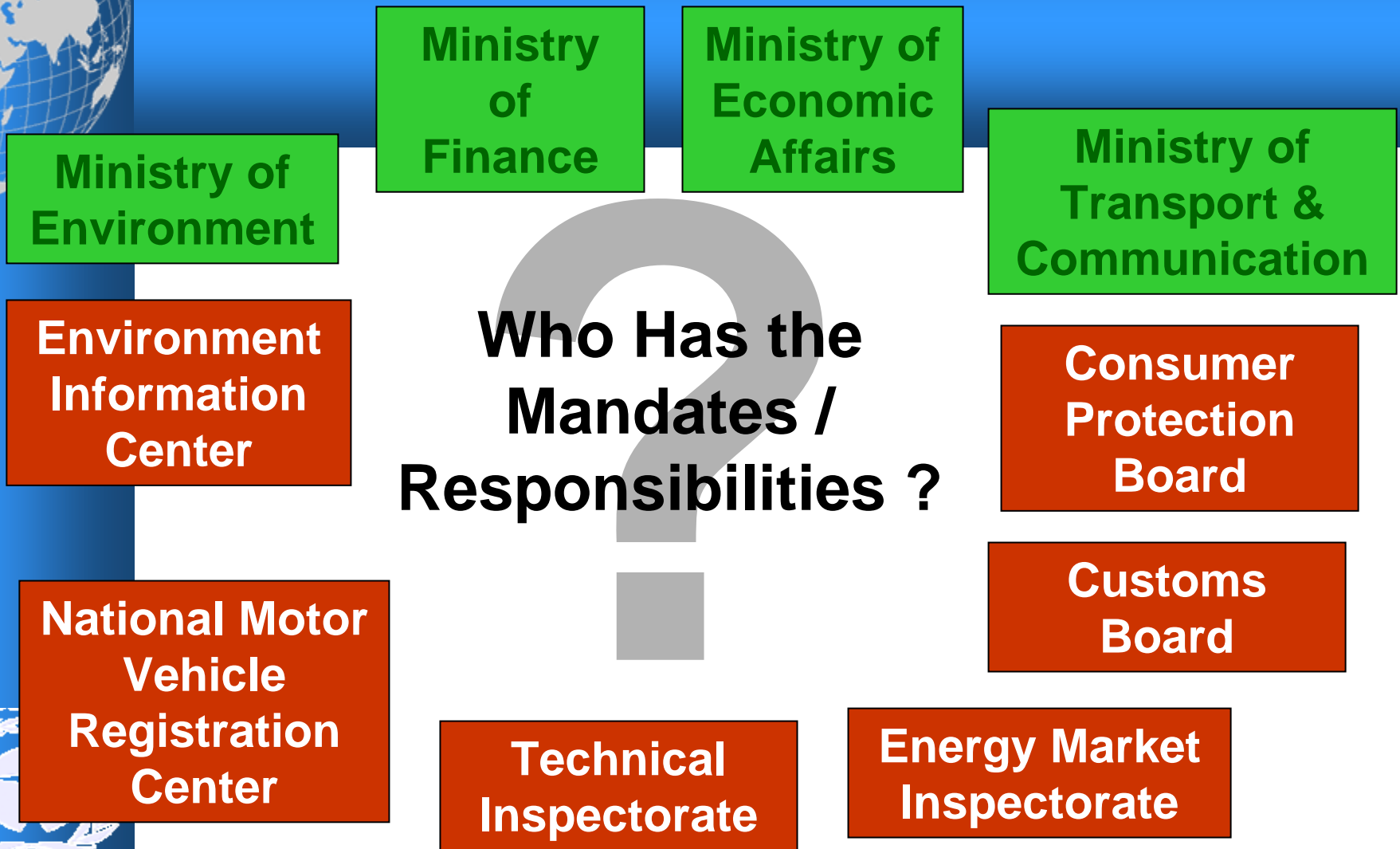
Implementation focused: those blocks strictly implementation focused such as investments into technology and BAT if possible, the allocation of financial and human resources etc.



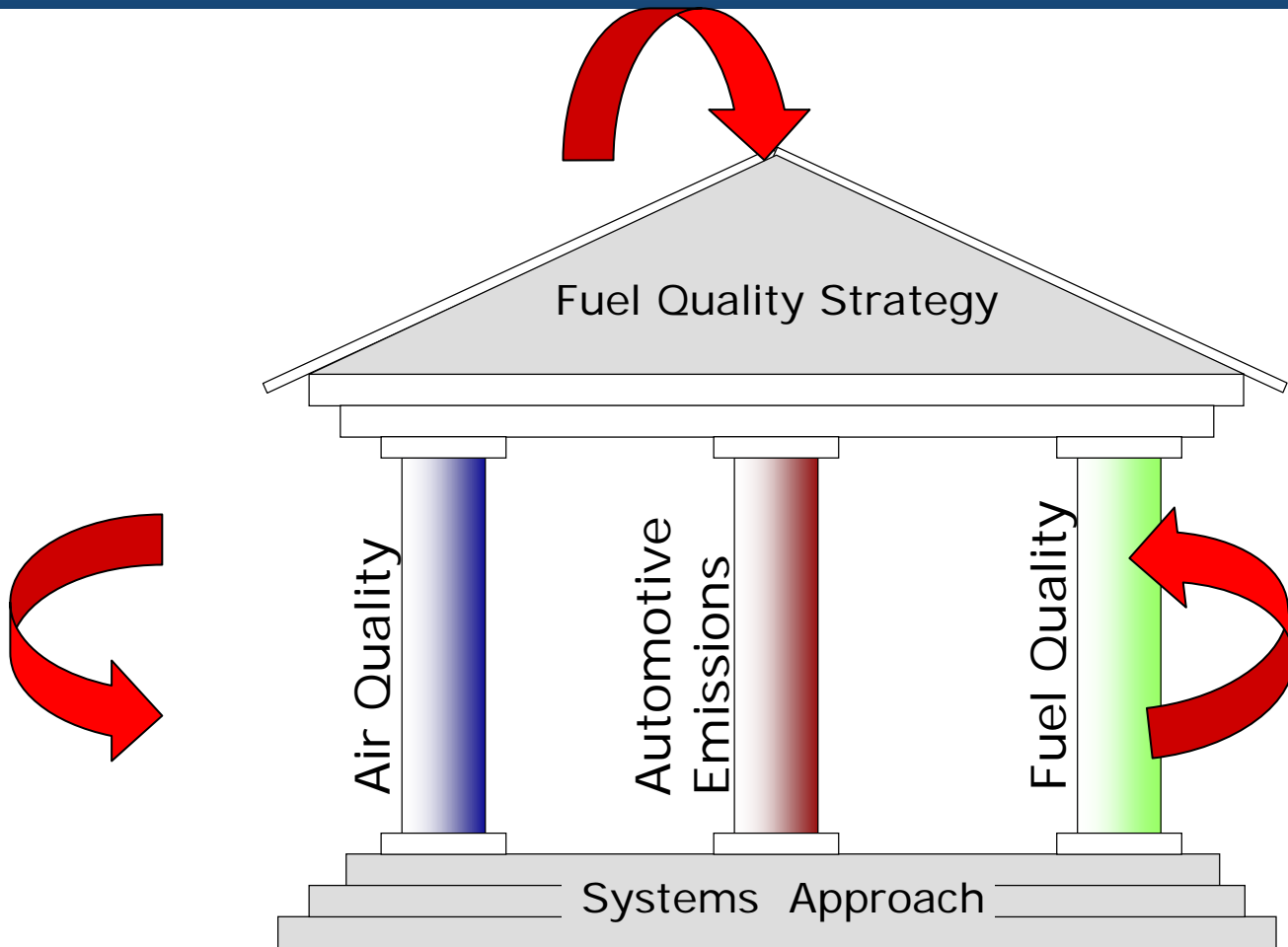
Driving Down Fuels Sulphur Levels in Europe



To Implement a Successful Roadmap...

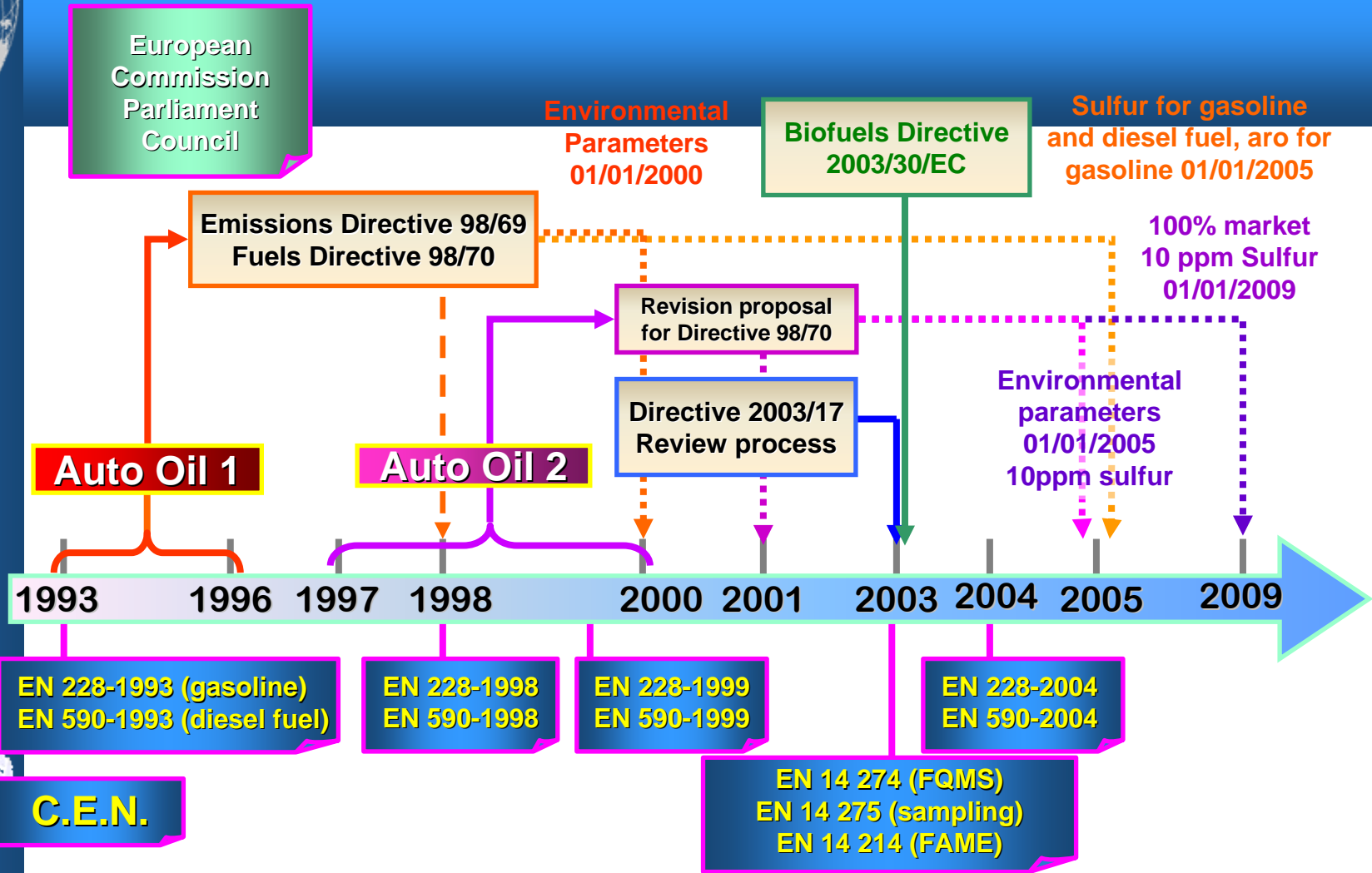


Putting it all Together: EU Fuels Policy



Source: International Fuel Quality Center (IFQC), 2003.

Putting It All Together: EU Fuels Policy





Critical Success Factors



A Potential Weak Link





Importance of FQMS

FQMS = Fuel Quality Monitoring System

Foundation of Clean Fuels is based on

- ✓ National Standards
- ✓ Ability to ensure and/or control fuel quality at the point of distribution
 - Monitoring Fuel Quality
 - Policing and Enforcing to ensure Compliance





Vehicle I & M

I&M = Inspection & Maintenance System

“20% of the vehicles produce 80% of the emissions!”

Emissions deteriorate over the Vehicle Life

- Wear; Catalyst deactivation; Component failures; Oxygen sensor response

Manufacturers are obliged to certify their emissions-related performance and components for an extended period of time (50,000 miles or 120,000 miles in the USA, and 100,000 km for current Euro 4 vehicles)

Components may still fail, suffer mechanical damage, or be subjected to tampering

- On Board Diagnostics

After the required durability period, the manufacturer would not be obliged to maintain a low emissions profile; mandatory scrappage an option

Safety & Emissions Together





Conclusion

Specification changes should be made step-by-step

Reasonable administrative guidance gives best results

Solutions must be based on reliable technology / fair economy

Suitable blending components are available

New specifications should be seen as a business opportunity





Remember....

Benefits for the Environment

Lessen health impacts from diesel emissions:

- Exacerbates asthma, respiratory and cardiac illness
- Possible human carcinogen

Improve air quality:

- 474 counties are out of compliance with the 8-hour ozone standard
- 225 counties are out of compliance with the particulate matter standard

Lessen the impacts on our most vulnerable populations:

- Children, the elderly and people with existing health conditions

Reduce CO₂ emissions that contribute to climate change:

- Every gallon of diesel consumed creates 22.2 pounds of CO₂

Improve energy security:

- Fuel prices, availability





Thank You

