

Disclaimer

The views expressed in this paper are the views of the author and do not necessarily reflect the views or policies of the Asian Development Bank (ADB), or its Board of Directors or the governments they represent. ADB makes no representation concerning and does not guarantee the source, originality, accuracy, completeness or reliability of any statement, information, data, finding, interpretation, advice, opinion, or view presented.

Enstrat International Ltd



Alternative Fuels
The Latin American Experience

Presented by: Mario Camarsa
John Lemlin

Scope of the Presentation

	<u>Commercial applications</u>	<u>Experimental applications</u>	<u>Abandoned technologies</u>
Ethanol in spark ignition engines	Brazil	-	-
Natural gas	Argentina/ Brazil	Chile	-
Ethanol emulsions in diesel engines	-	Brazil/Chile	-
Vegetable oils and esters	-	-	Brazil

*Diesel/water emulsions used commercially in Europe and look promising

Ethanol in Spark Ignition Engines (Emission Changes in pre-catalyst cars)

	<u>25% Ethanol in gasoline</u>	<u>100% Ethanol</u>
CO	-39%	-67%
HC	-36%	-66%
NO_x	-	-16%
Aldehydes	+30%	+220%

Emission Changes with Natural Gas

	<u>Versus gasoline passenger cars</u>	<u>Versus diesel trucks and buses</u>
CO	-60% to -80%	-70% to -95%
NMHC**	-5% to -15%	-10% to -20%
NO_x	+10% to +20%	-60% to -85%
PM₁₀	-15%	-60% to -80%

****Very large increase of methane emissions**

Use of Diesel/Ethanol Emulsions in Diesel Engines

<u>Pollutants</u>	<u>% Emission Change</u>
CO	--
HC	+10 to +20
PM10	-15 to -35
NO _x	-5 to + 5
Aldehydes	+50 to +100

Helping/Hampering Factors Strategic Considerations

	<u>Helping</u>	<u>Hampering</u>
Use of local resources	YES	--
Support agriculture	YES	--
Global CO2 emission benefits	YES	--

Helping/Hampering Factors

Economic Considerations

	<u>Helping</u>	<u>Hampering</u>
Higher production costs than conventional fuels	--	YES
Government subsidies	YES	--
Higher distribution costs	--	YES

Helping/Hampering Factors

Technical Considerations

	<u>Helping</u>	<u>Hampering</u>
Require engine modifications	--	YES
Reduced emissions of conventional pollutants	YES	--
Increased emissions of other pollutants	--	YES

Enstrat International Ltd

