California Air Resources Board
California Energy Commission

Alternative Diesel Fuels Symposium

August 19-20, 2003

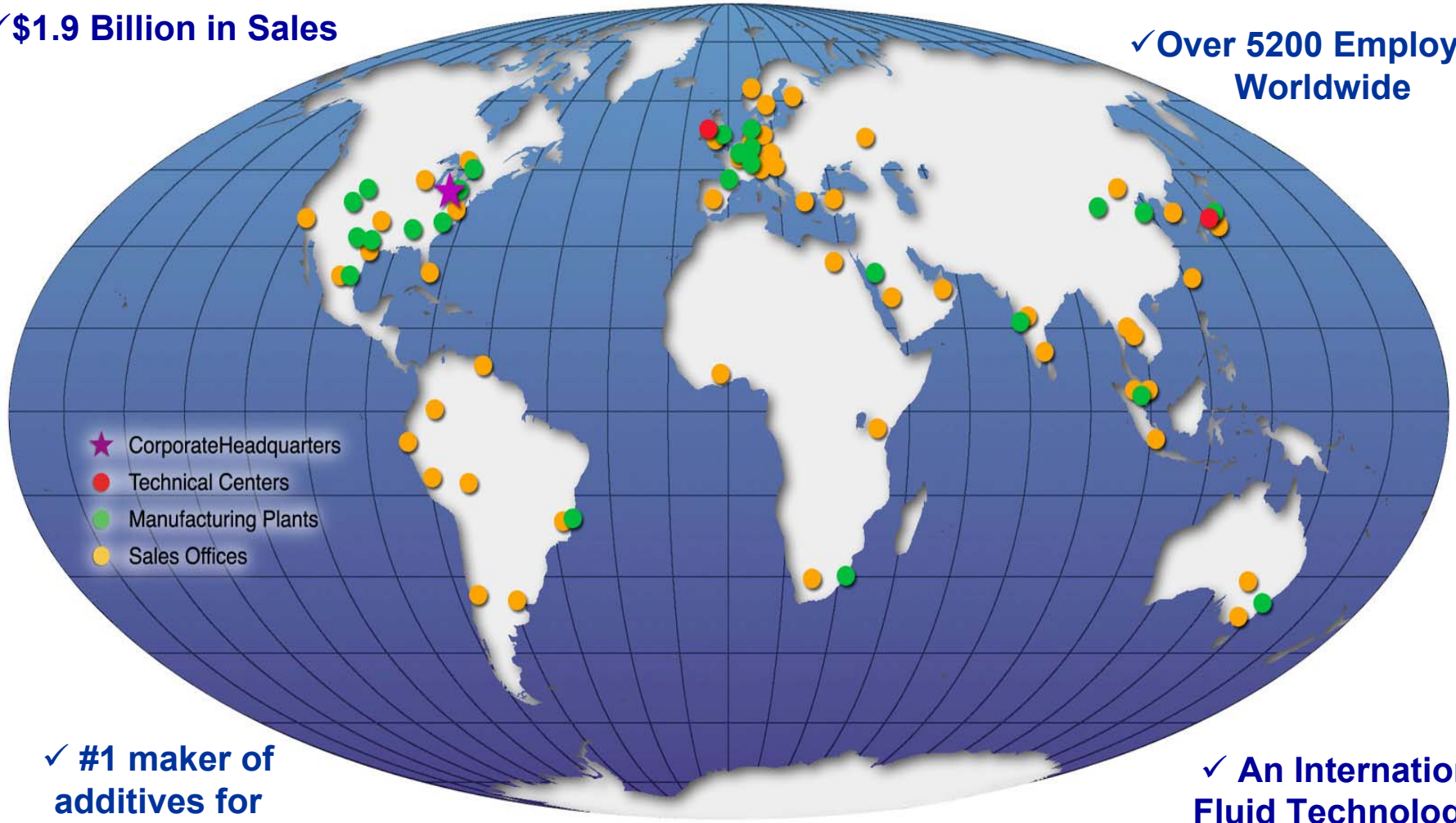
celebrating 75 year

LUBRIZOL

Lubrizol: Corporate Profile

✓$1.9 Billion in Sales

✓Over 5200 Employees Worldwide



✓ #1 maker of additives for lubricants and fuels

✓ An International Fluid Technologies Company

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Our Vision:

Fluid

Technologies

For a **better** world

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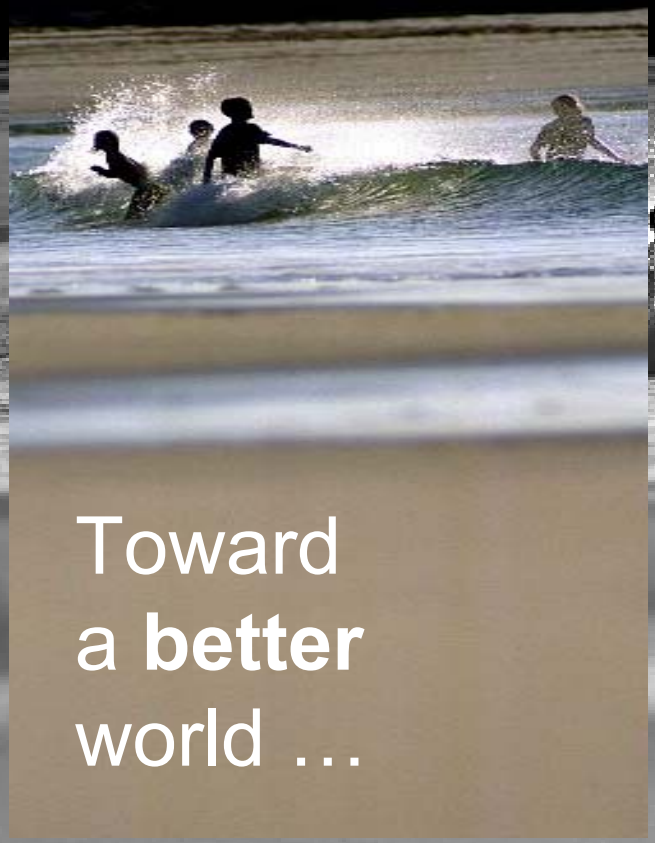

Toward
a **better**
world …

Last
longer

Work
better

**Benefit
the
environment**

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Fluid technologies for a better world™

PuriNOx™ Technology

ow-emission diesel fuel system

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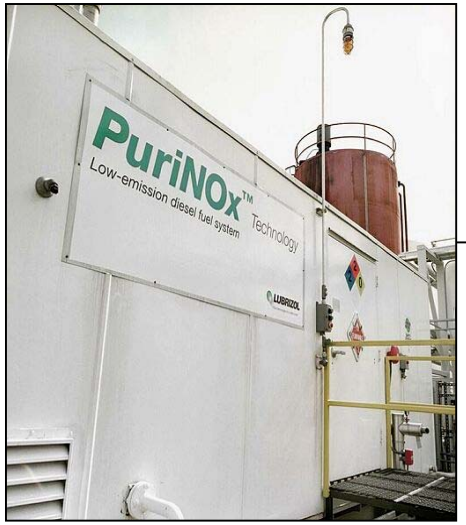
PuriNOx™ Technology

PuriNOx™ Additive Package

Water

Diesel Fuel

Seasonal or Other Components



PuriNOx™ Blending Unit = PuriNOx™-powered fuel

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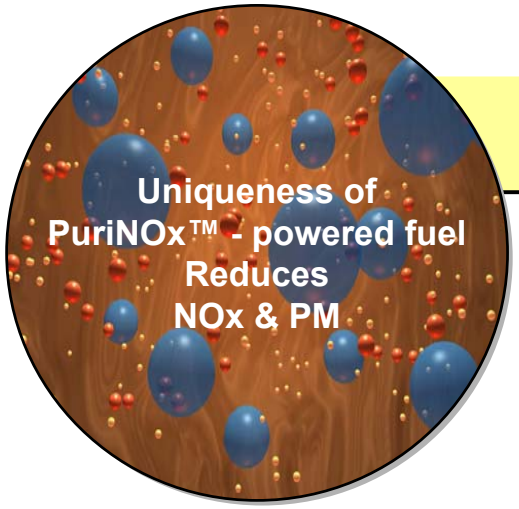
PuriNOx™ - Powered Fuel



Reduces NOx by up to 30% and Particulates by up to 65%

Tested and Confirmed Energy Savings of 1-3%

Used Immediately with Minor Maintenance (Fuel Filter Change) by Dispensing Fuel Directly into Vehicle Tanks

Uses Existing Storage, Distribution and Fueling Facilities with Minor Modifications

Handles Like Diesel Fuel
But with defined stability parameters

Emission Reduction Summary

	NOx	Particulates
LZ Claim	Up to 30%	Up to 65%
Average Dynamometer	12.6%	46.4%
Average In-Use	26.6%	45.3%
CARB	14%	63%
AIR Inc.	19%	54%
US EPA	9 – 20%	16 – 58 %

Based on 20% water

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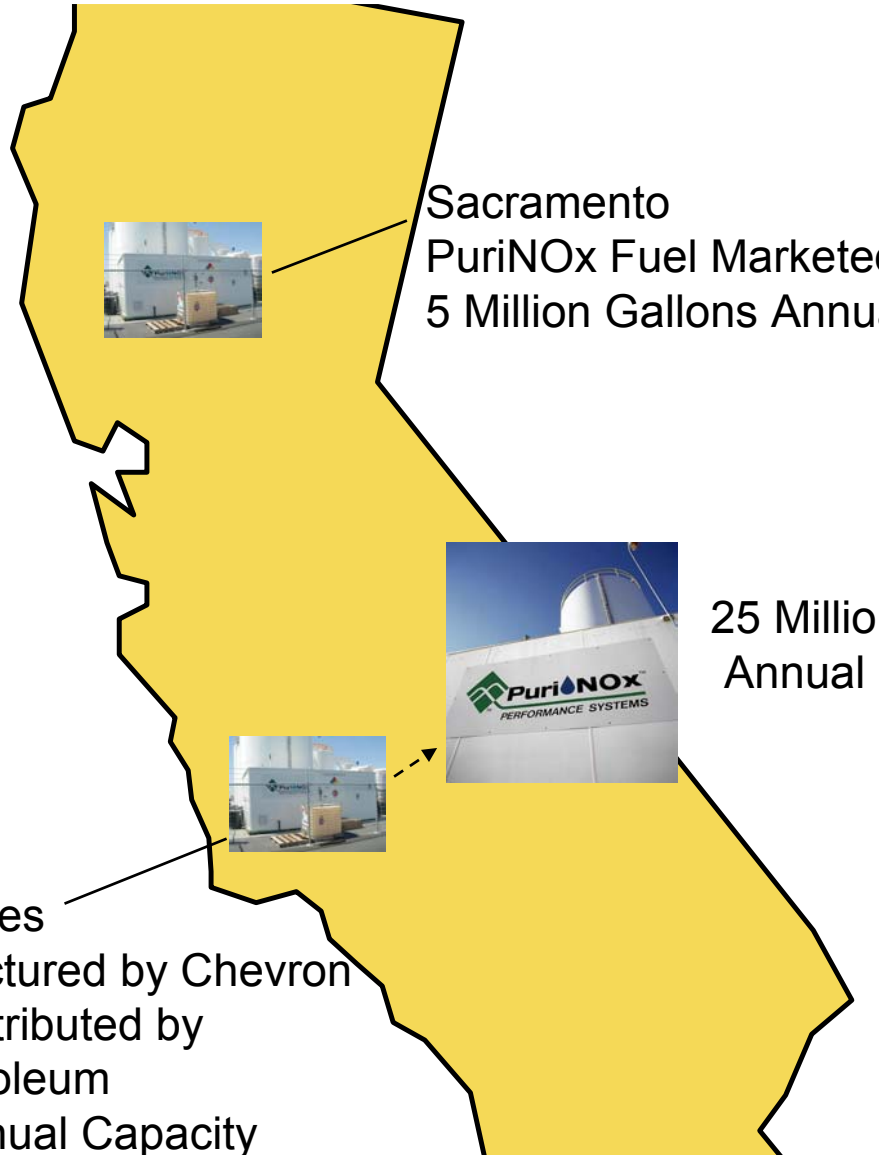
PuriNOx Technology - California



Sacramento
PuriNOx Fuel Marketed by Ramos Oil Company
5 Million Gallons Annual Capacity

25 Million Gallons
Annual Capacity

Los Angeles
Proformix® Fuel Manufactured by Chevron
Marketed and Distributed by
General Petroleum
5 Million Gallons Annual Capacity

End-Use Applications

Emission Sensitive

Emission Sensitive

Intensive Use Applications

Centrally Fueled Equipment

- On-Highway
  - Pick Up & Delivery Fleets
  - Urban/School Buses
  - Waste Management Fleets
- Off-Highway
  - Mining
  - Construction
  - Stationary Power
  - Port

Others: Agriculture, Locomotive, Marine

Emission Sensitive

Emission Sensitive

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Intermodal Equipment Retrofits

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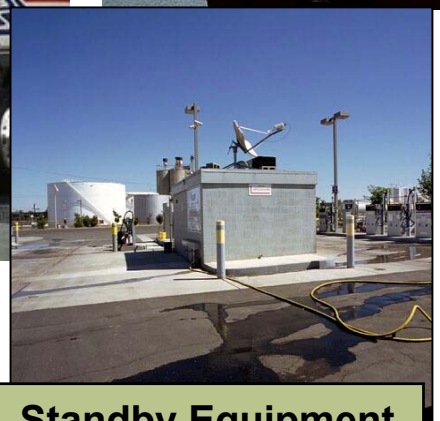
California Applications



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PuriNOx™ Fuel Regulatory Credentials

Credential	Date Obtained
U.S. EPA Fuel Registration – PuriNOx™ All Weather Blend Fuel Assessed health effects of PuriNOx™ all weather blend fuel.	July 15, 2003
U.S. EPA Emissions Verification Established on- and off-road emission verification values for PuriNOx™ fuel including NOx, PM, HC and CO.	December 30, 2002
U.S. EPA Fuel Registration – PuriNOx™ Summer Blend Fuel Assessed health effects of PuriNOx™ summer blend fuel.	October 2, 2002
California Air Resources Board (ARB) Verification Verified that PuriNOx™ fuel reduces NOx by 14% and PM by 63%.	January 31, 2001

PuriNOx™ Fuel is currently the only diesel emulsion to be formally verified and registered by U.S. EPA

California Regulatory Credentials

ARB Verification Stationary Source Division (Voluntary Markets)	ARB Verification Mobile Source Division (Regulated Markets)
• 14% NOx and 63% PM • No net increase in toxic emissions • Hydrocarbon emissions are at least 25% lower than any applicable diesel vehicle standard	**Lubrizol Technology** **•February 2003 -- ARB confirmed emission reductions of 20% NOx and ≥50% PM for specific off road applications.**

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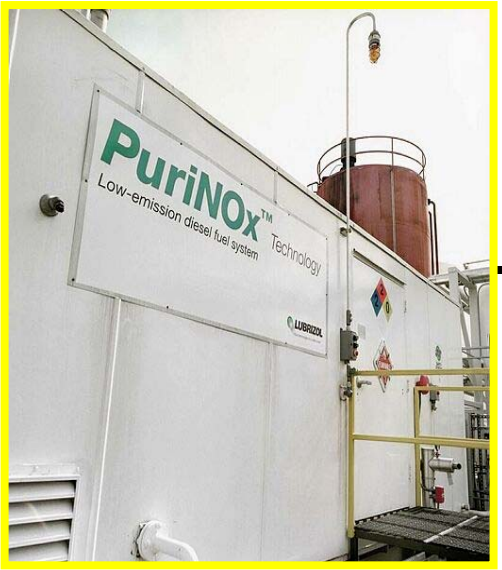
PuriNOx Synergies with Aftertreatment
An Integrated Performance System

Additive Package

Water

Diesel Fuel

Seasonal or Other Components



Fuel Blending Unit

PuriNOx™ Fuel

+

AZ Purifier, AZ Purimuffler™ or Purifilter™

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PATH FORWARD

The PuriNOx Technology has clearly demonstrated that Emulsified Diesel is a valid, long term emission control strategy.

As such, it is pioneering what we believe will become an industry.

Question: How best to make it a permanent and integral element of California's Clean Air Initiatives?

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PATH FORWARD

VERIFICATION

- Balancing the cost effectiveness of verification processes and the obligation to ensure technologies do what they say they do is not easy.
- Two or more separate verification processes, whatever their cost and rigor, cannot be termed cost effective, absent reciprocity.

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PATH FORWARD

MOBILE EMISSIONS TRADING

The challenge is to transform environmental value into economic value.

Mobile Emission Credit Trading is a viable path to assure surplus emission reductions are achieved and centrally fueled end user fleets derive value from using cleaner technologies.

Preserving the Long-Term Role of "Alternative" Diesel Fuels

Ideas For Consideration

- Reciprocating Cost-Effective State And Federal Verification Processes.
- Enhance And Promote Existing Mobile Source Emission Credit Trading Mechanisms.