



***Eden Energy Ltd***

**A Major Alternative Energy  
Opportunity**

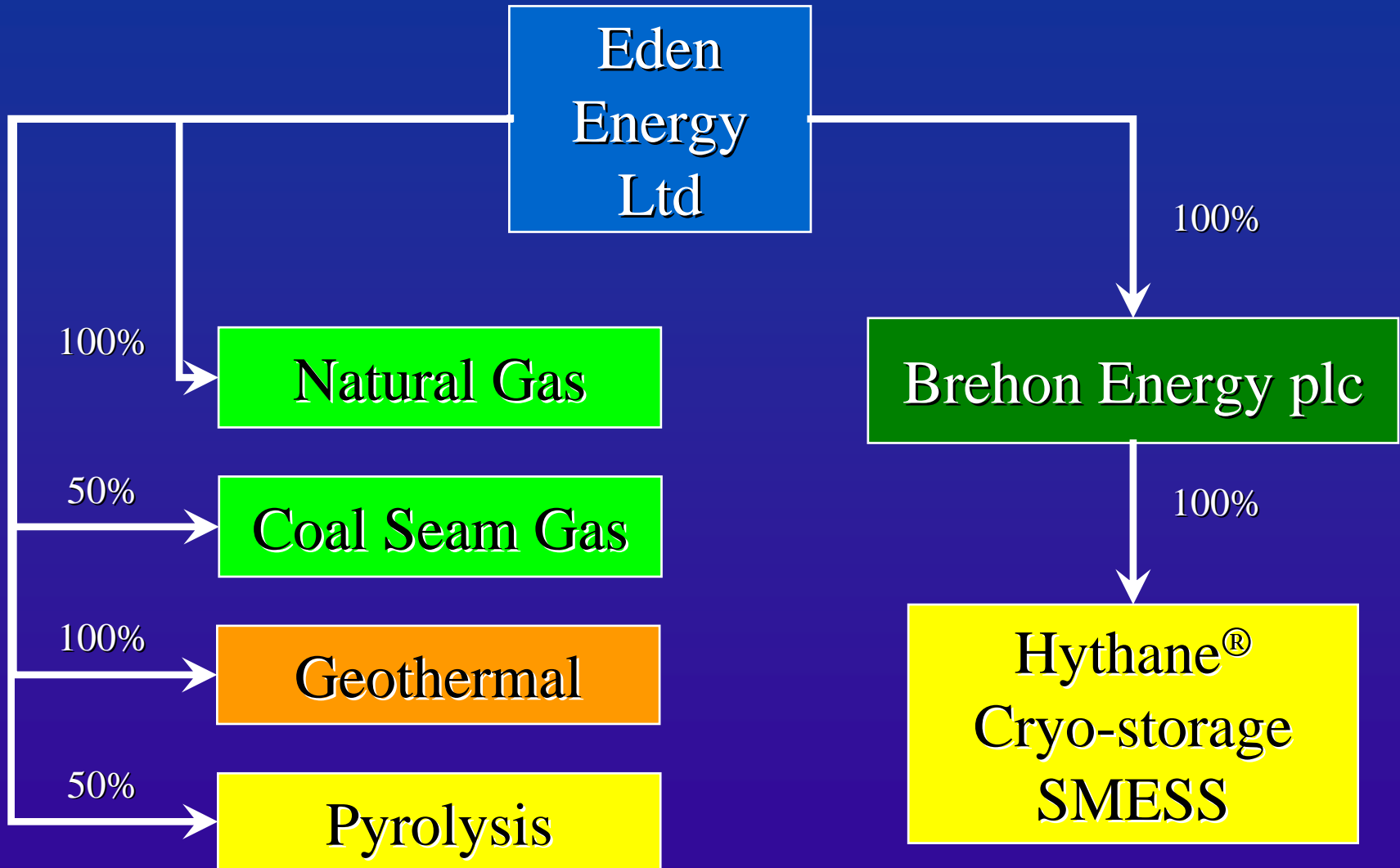
Presentation by:

**Greg Solomon, LLB**

*Executive Chairman*

30 November 2006

# Corporate Overview



# Hydrogen & Hythane<sup>®</sup>

# Hythane Company LLC

A wholly owned subsidiary of Eden Energy/Brehon Energy

## PRODUCTS

- **Hythane®** technology- a mixture of natural gas & hydrogen
- **Hythane®** - production and dispensing equipment
- **Cryogenic technology** - fuel storage/pipes/valves
- 14,000 sq. ft. R & D Facility in Littleton, Colorado
- World class team of employees and consultants
- Patents/ trademarks

# World Class Technical Team

- **Frank Lynch**- invented Hythane, 35 years H<sub>2</sub> experience
- **Dr Tom Flynn**- 50 years NASA related H<sub>2</sub> projects
  - wrote leading texts on cryogenic engineering
- **Dr Bob Rudland**- 30 years experience in H<sub>2</sub> in aerospace
- **Dr Glen McIntosh**- 50 years NASA H<sub>2</sub> fabrication expert
- **Greg Egan**- 25 years experience in H<sub>2</sub>
- **Roger Marmaro**- co-invented Hythane-15 years
- **Justin Fulton**- leading gas combustion engineer
- **Steve Hensley** - 25+ years in cryogenics

# Patents and Trademarks

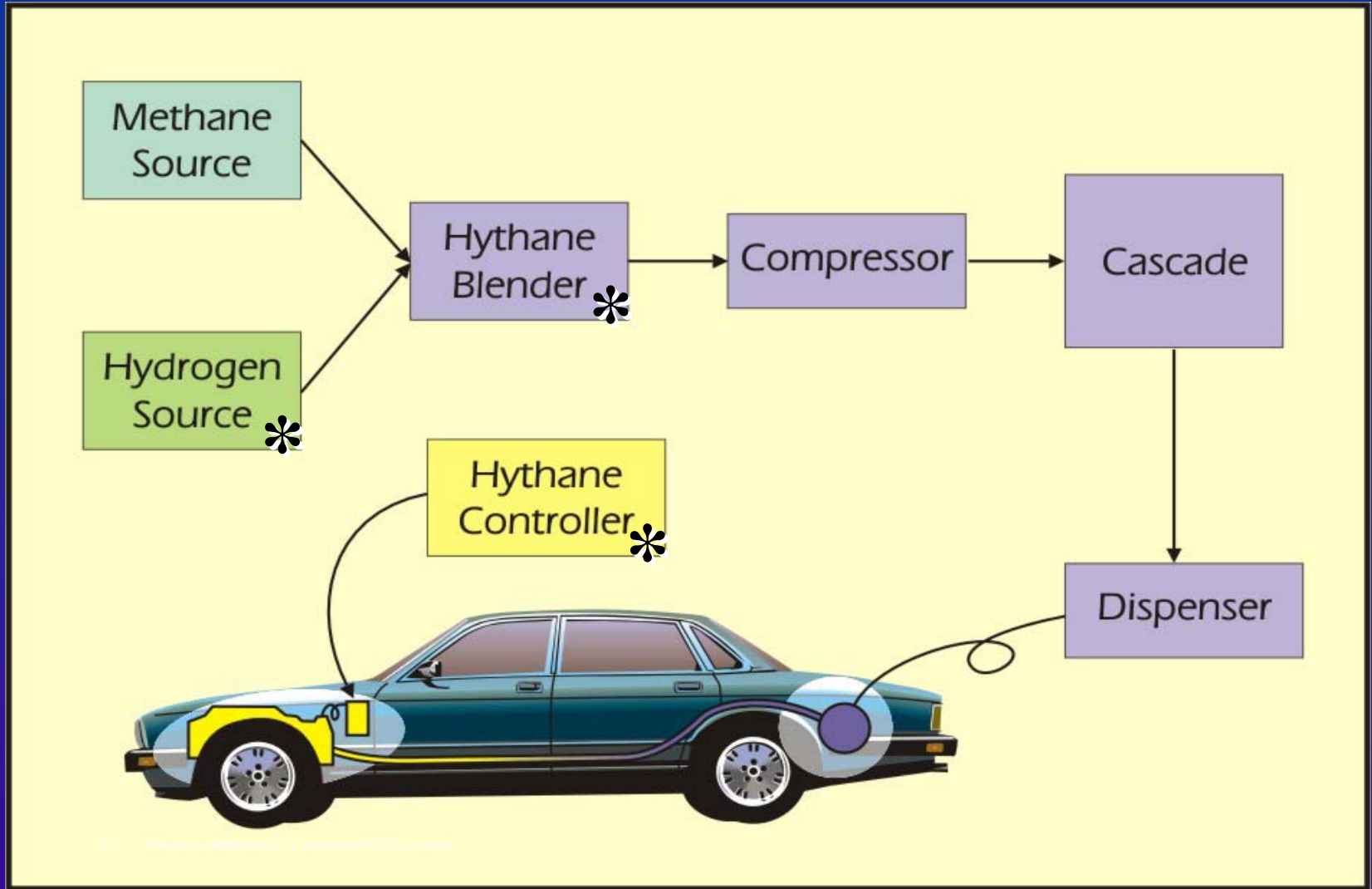
- Hythane® Patent- USA (granted)
- Hythane ® Blender- Worldwide (application)
- Cryogenic Storage Tank- Worldwide (application)
- Portable Superconducting Battery- Worldwide(application)
- Cryogenic Hythane ( LNG/ H<sub>2</sub>)- Worldwide (application)
- Hythane ® Operating System- Worldwide (application)
- Hythane ®Trademark-USA, Canada, Australia(granted)
  - India, China, Singapore(application)

Further patents under development

# Hythane®-the transition fuel

- Low cost technology proven over 15 years
- Uses existing Natural Gas/H<sub>2</sub> infrastructure
- 5-7% by Energy H<sub>2</sub>/Natural gas (no high purity required -can use waste H<sub>2</sub> streams)
- 50% NO<sub>x</sub> reduction compared with NG
- Suitable for CNG / LNG/Dual fuel

# Hythane<sup>®</sup> Operating System



**Target - all Natural Gas vehicles, with buses as the primary market**

**\* = additions/modifications to a standard Natural Gas system**



# CNG / Hythane® Dispensers

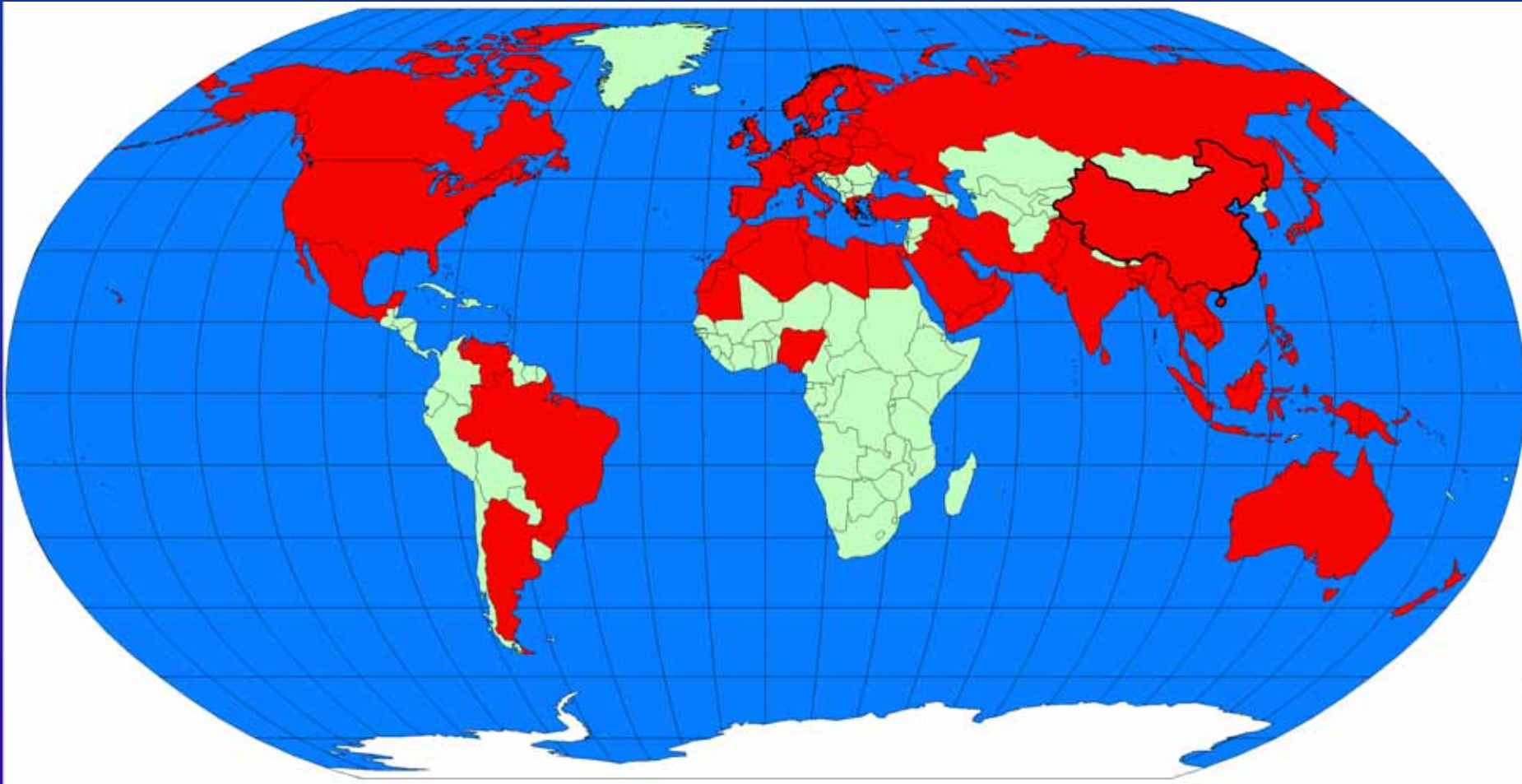


# LNG Vehicles in California

LA/DoE Clean Corridor Project



# Target markets for Hythane®

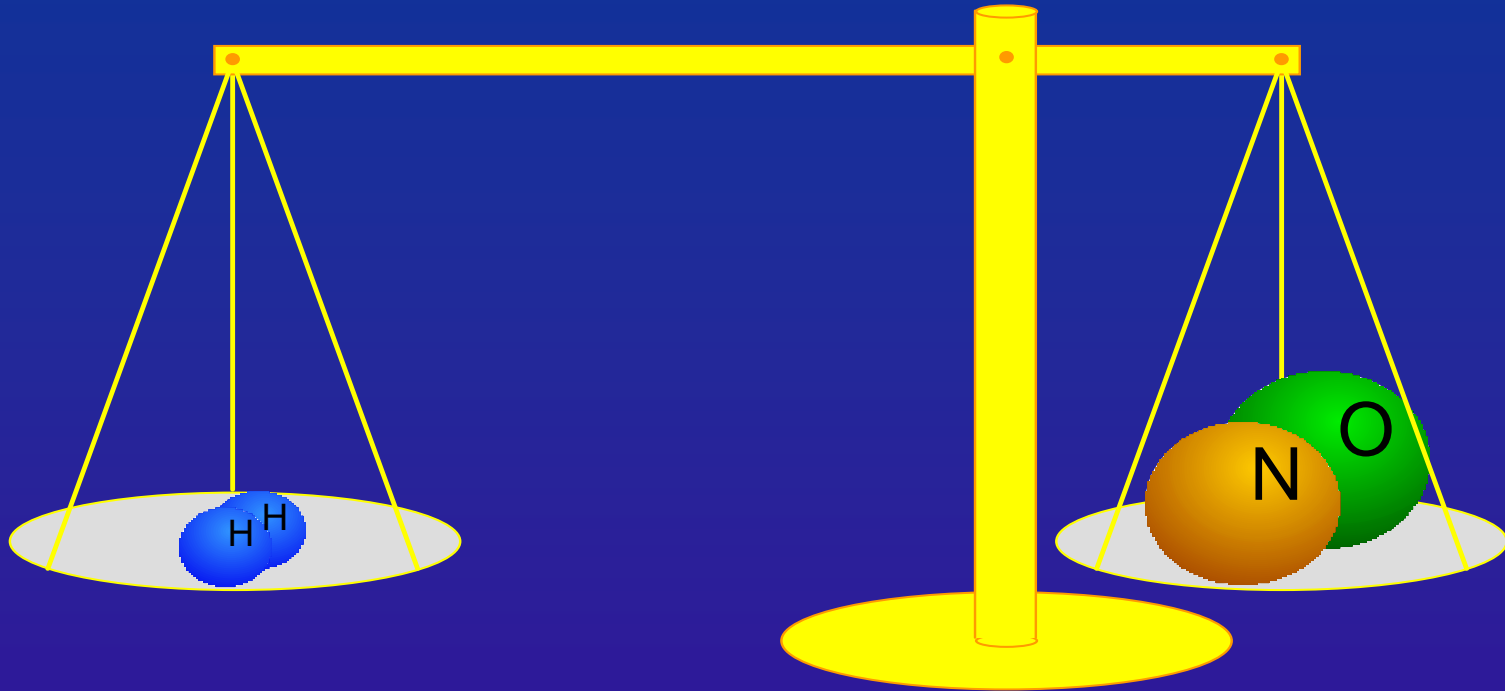


All Natural Gas Markets

# Factors driving transition to Hydrogen

- Peak in global oil production / oil prices
- Concern over dependence on Middle East oil
- Concern over global climate change / warming
- New emission standards - US/ Europe
- Local Air Pollution-  $\text{NO}_x$

# Hythane® - leveraged use of hydrogen



5-7% hydrogen( by energy)= 50% NO<sub>x</sub> reduction

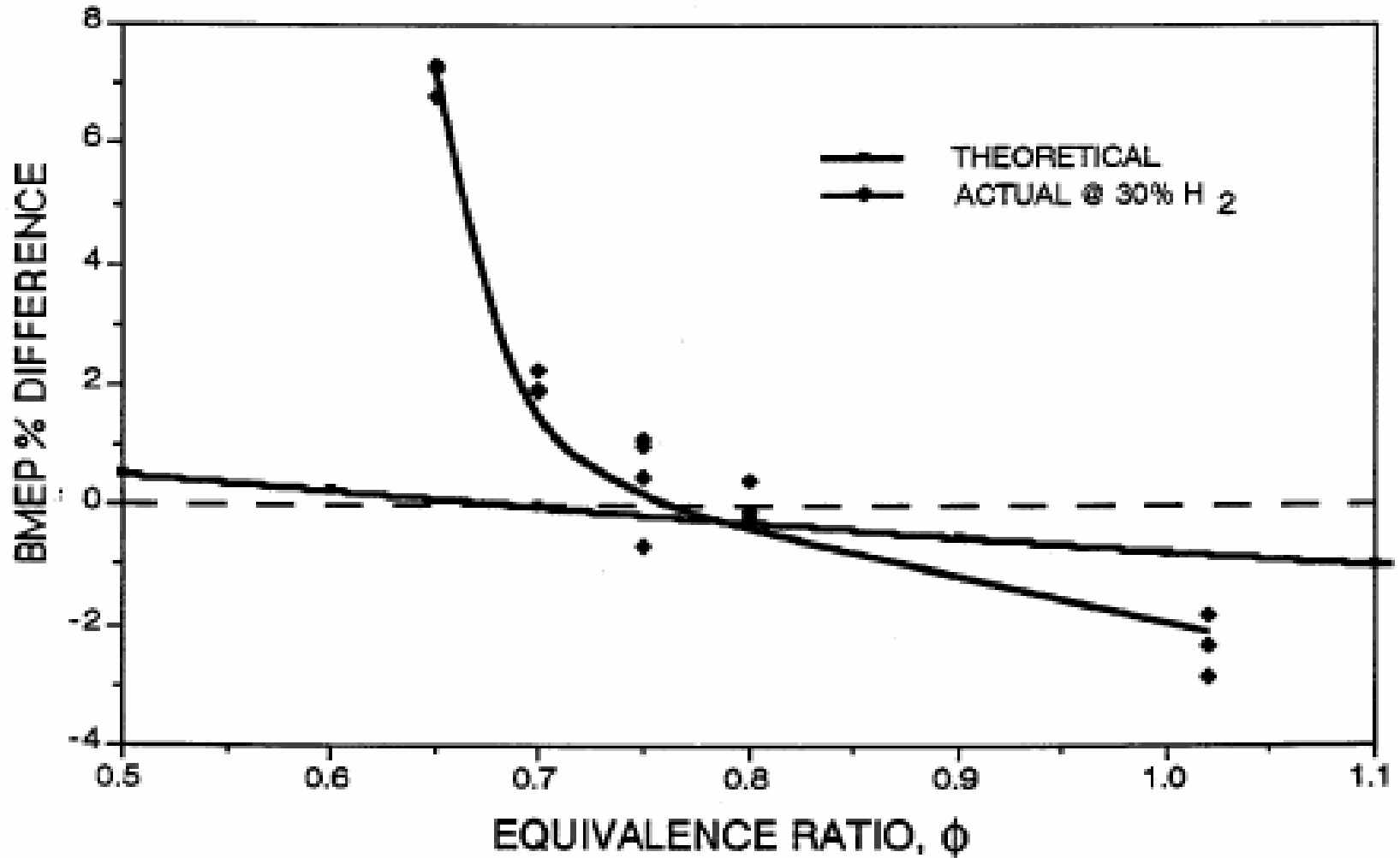
Hythane® reduces NO<sub>x</sub> by 7+ times more than if used as pure H<sub>2</sub>

# Suitable Hydrogen Sources

- Production from Natural Gas reformation
- Electrolysis
- Industrial Waste H<sub>2</sub> streams
- (e.g. Steel mills, Chlor-alkali and Glass Plants)
- Low purity (90% +) H<sub>2</sub> suitable for Hythane ®

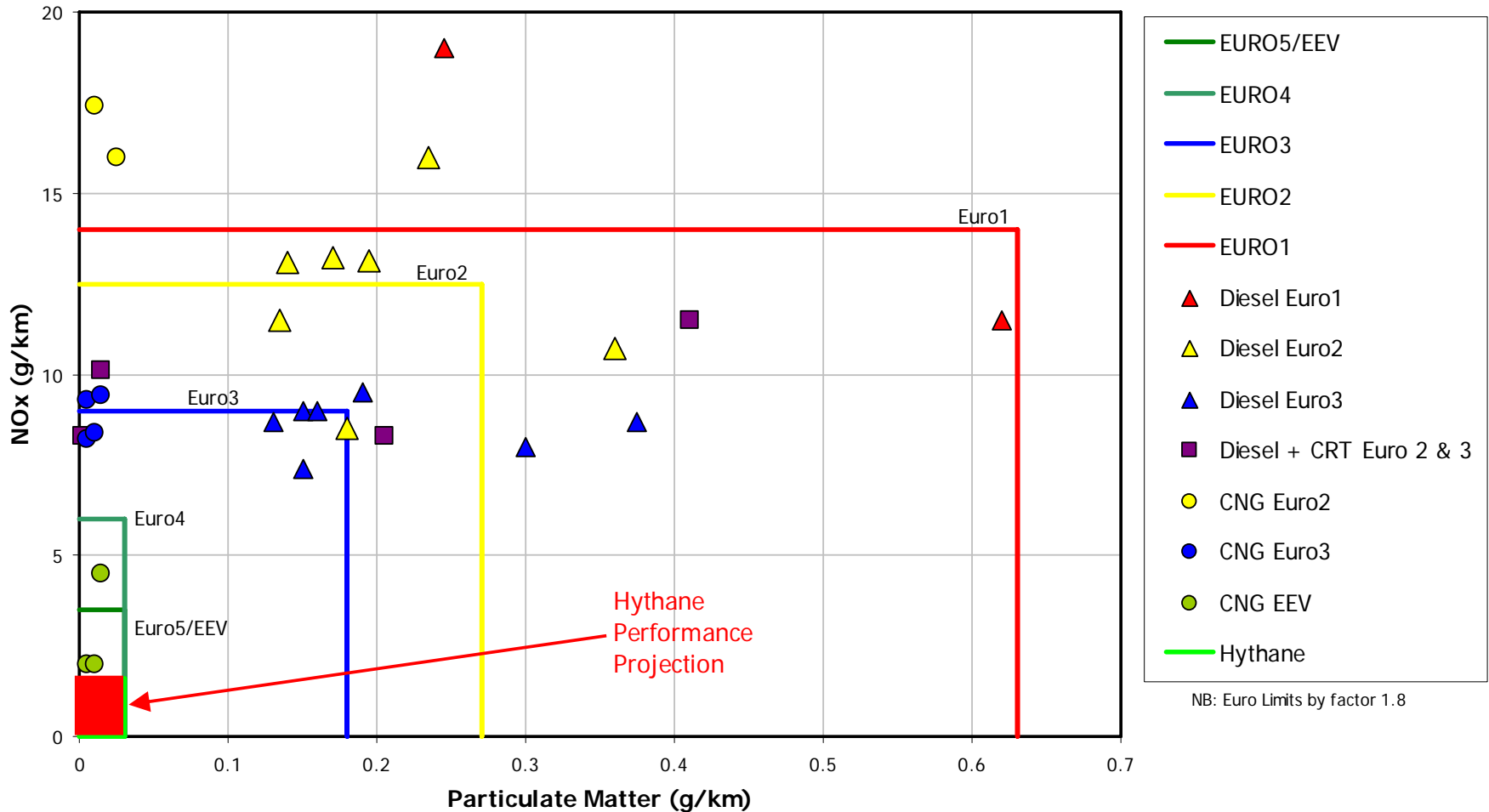


# Effect of Hydrogen Addition Near Lean Limit



# Hythane® meets Euro 1 - 5

NO<sub>x</sub> & PM emissions over the Braunschweig city bus cycle





## Hythane® Projects

- 1990 HCI pickup truck – first Hythane® vehicle
- 1992 Denver - 3 light truck comparison project
- 1995-96 Montréal - 2 bus pilot project
- 2002-04 Palm Springs, California - 4 bus pilot project
- 2005 China - Yuchai engine conversion
- 2006-07 Projects planned- USA, India, Australia

# First Hythane® Vehicle 1990



5% Hydrogen (by Energy Content), Balanced CNG

Tanks Under Truck Give 250 km Range

# Denver Hythane® Project 1993



5% energy H<sub>2</sub> in CNG



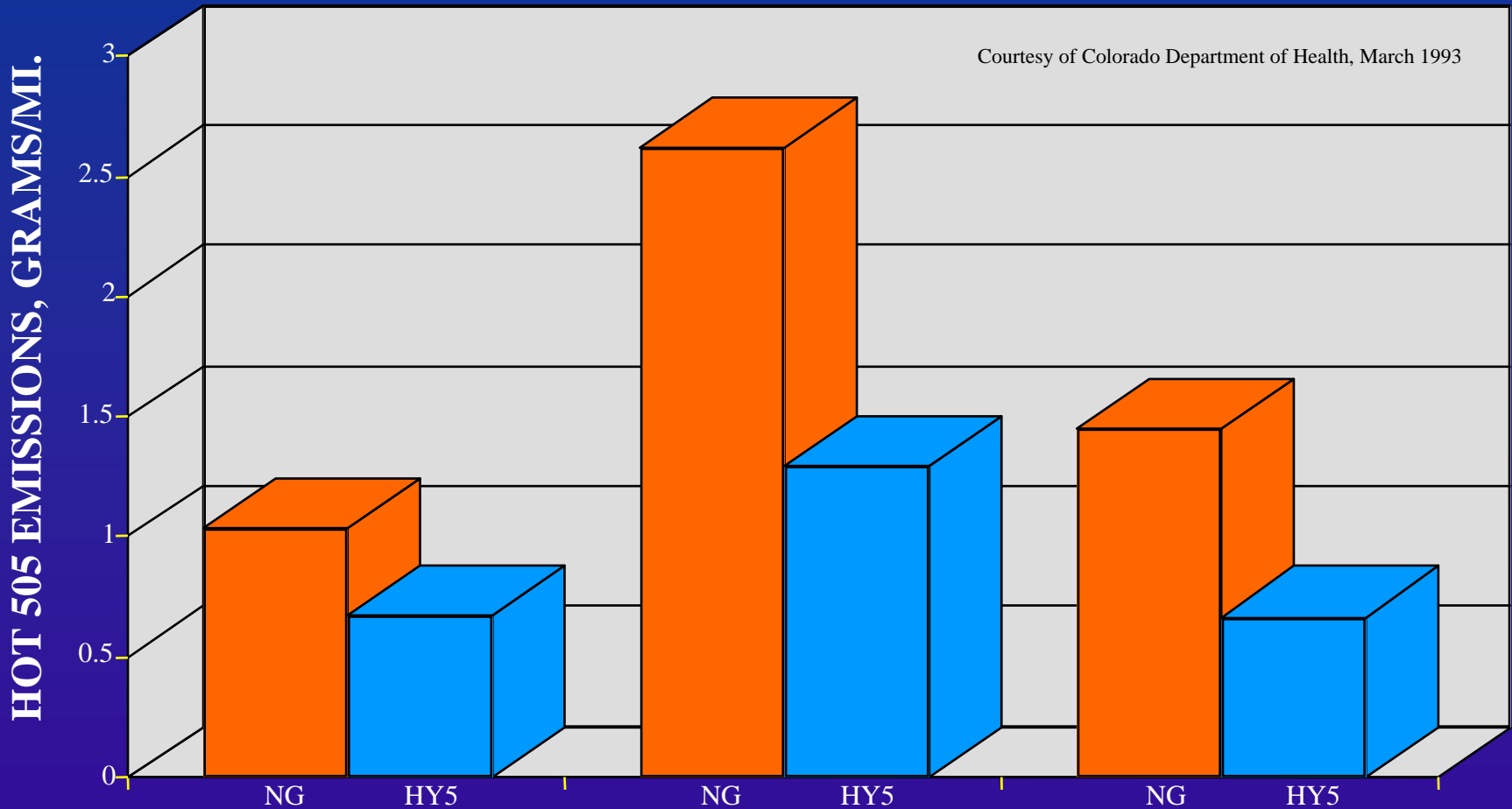
# Hythane® Bus Projects

Montreal 1993-1995



California 2002-2004

# Denver Hythane® Project Results



**THC**

**CO**

**NO<sub>x</sub>**

50% Reductions in CO and NO<sub>x</sub>, 5% H<sub>2</sub>: Leverage Factor = 10!

# Hythane<sup>®</sup> Strategy



Yuchai Hythane<sup>®</sup> engine

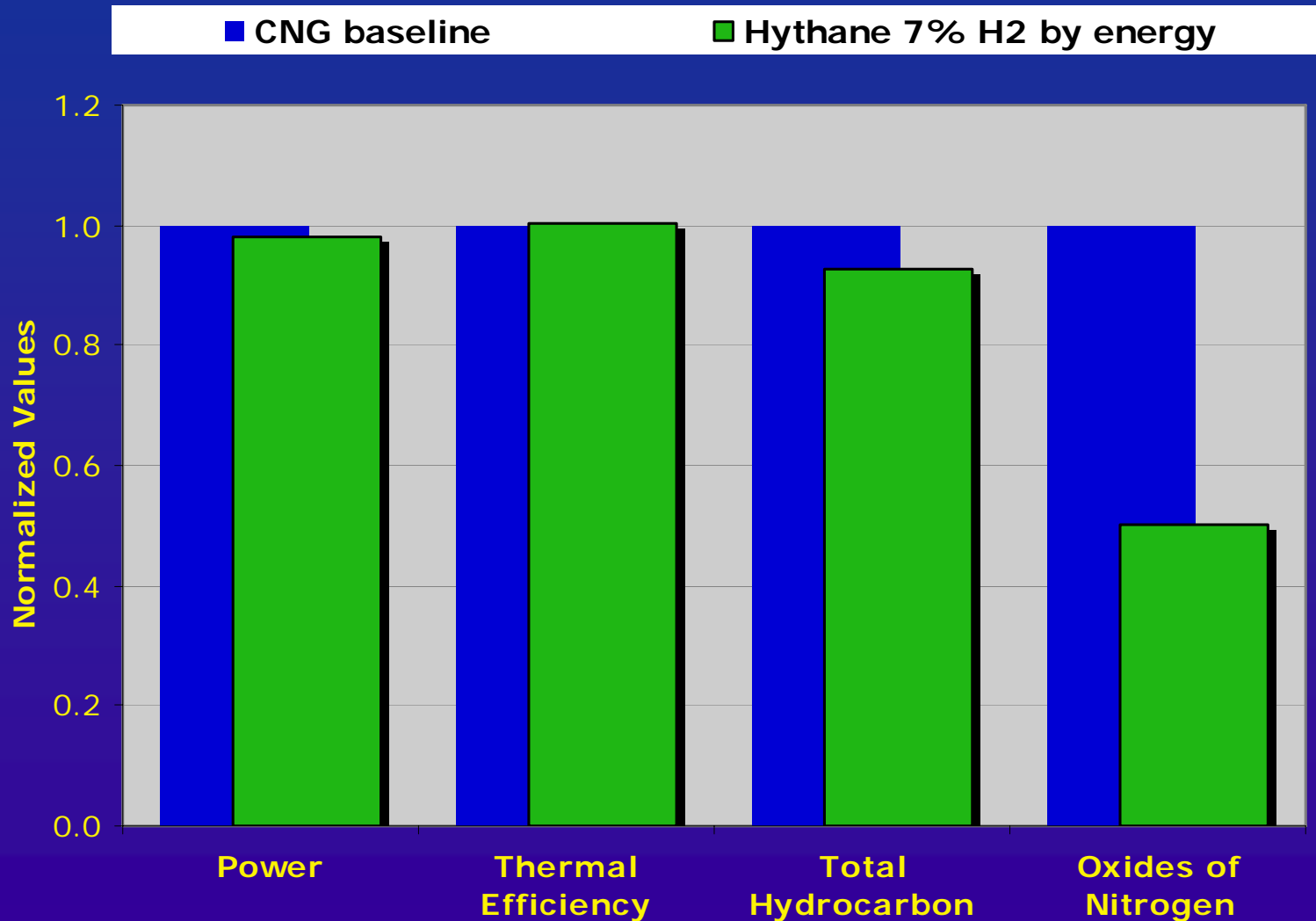
Objective:

- Reduce NO<sub>x</sub>
- Reduce THC
- Increase Efficiency

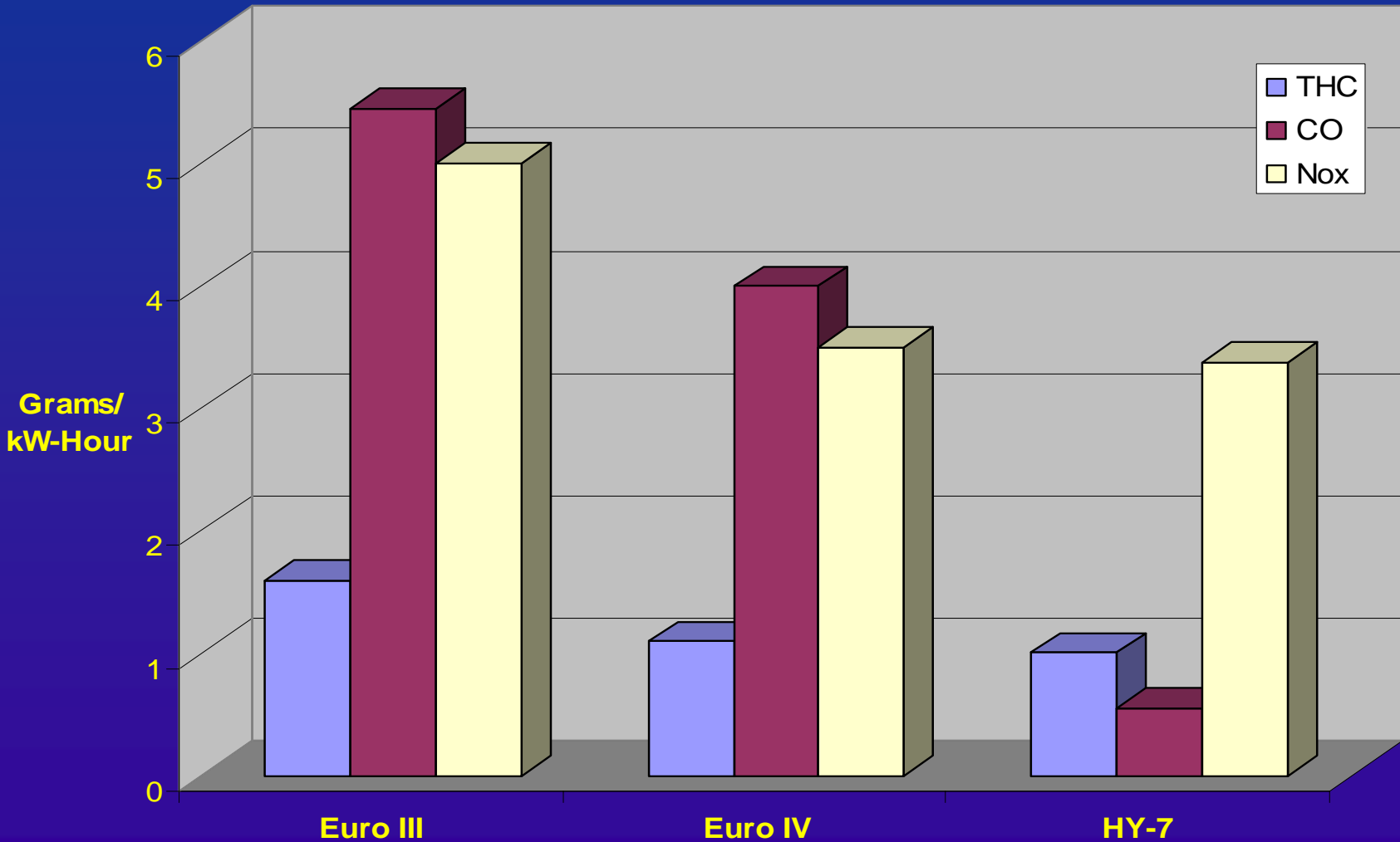
3 interdependent parameters in adjusting a lean burn CNG engine for Hythane<sup>®</sup>. Changing any one affects the others.

# Yuchai Hythane® Engine Data

## Yuchai YC6G260N Emissions Results European Stationary Cycle



# Yuchai Euro IV Hythane® Emissions





# Indian Hythane® Marketing Progress

- Aims:
  - to convert CNG bus fleets to Hythane®
  - to convert CNG taxis, autorickshaws to Hythane®
  - to target fleet truck operations -CNG / Dual Fuel
- Agreement for first Hythane® engine conversion
- Hythane® demonstration project planned for Q1 2007
- Strong Central Government for Hythane®
- Government Blue Sky Project - 11 cities

# USA Hythane® Marketing Progress

- Californian ARB proposal to approve Hythane® as Near Zero Emission Fuel under new emission standards
- First DoE contract for Hythane®/ hydrogen engines
- MOUs for several major demonstration projects signed/ under negotiation in California and northeast USA
- Growing interest from all relevant parties

# Australian Hythane® Marketing Progress

- Possible interest in Hythane ® bus demonstration project in Perth to use H<sub>2</sub> infrastructure
- Interest in developing Hythane ® for:
  - LNG / Dual Fuel
  - locomotives
  - gas turbines

# Chinese Hythane® Marketing Progress

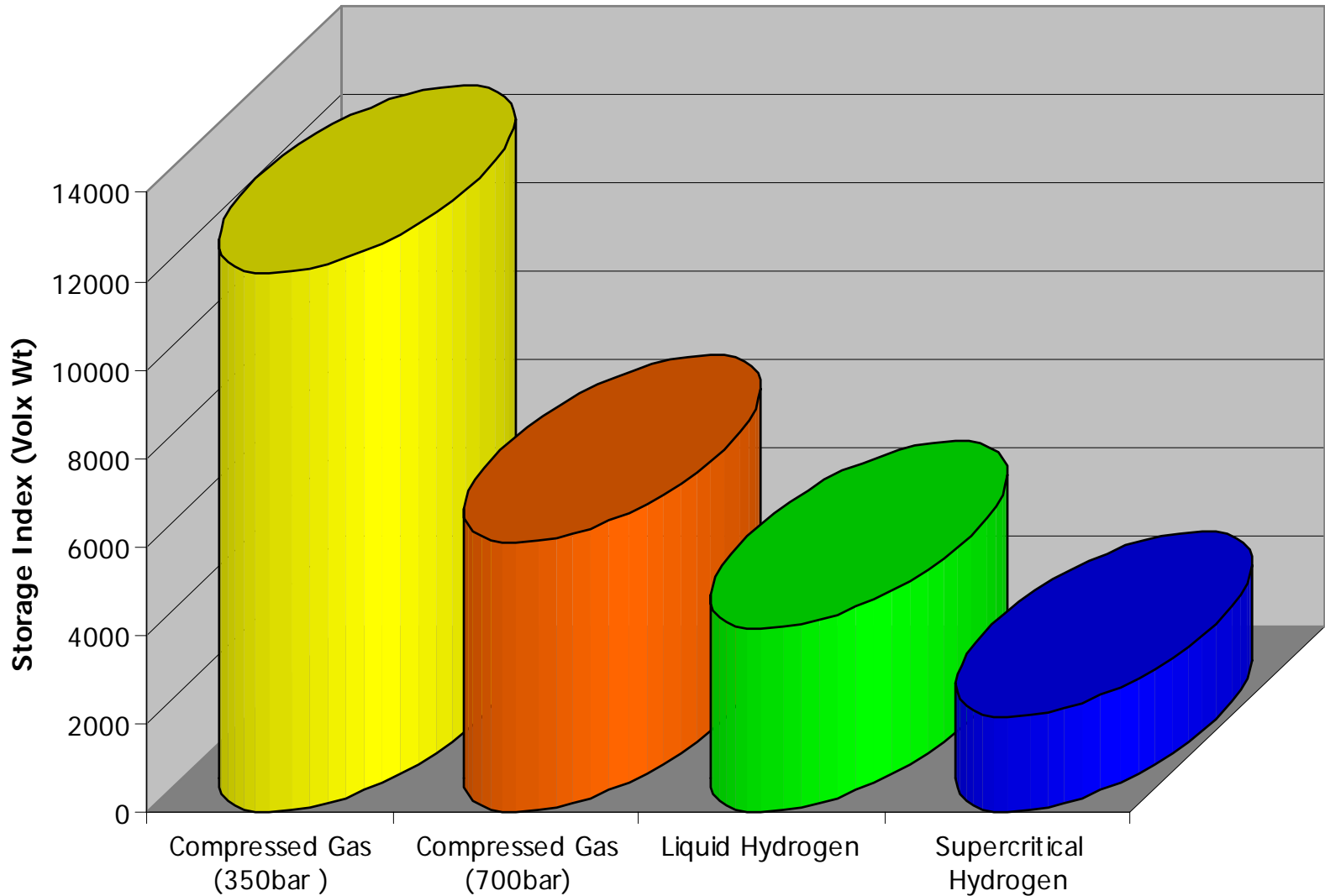
- 6 MOUs signed in 2005
- Yuchai engine conversion- Euro IV achieved
- Preliminary Approval for 16 City Clean Air Program
- Interest from Controller, Engine and Bus Manufacturers
- Central Government and Academic Support

# SUPERCRITICAL CRYOGENIC STORAGE

## **Supercritical Cryogenic Storage**

- Suitable for LNG, Hythane, Hydrogen
- Single phase – no ullage, low pressure operation
- Volume, weight and dimensions are smaller
- Long term standby loss is lower
- Greater safety – minimizes potential for detonation
- Sufficient driving pressure for vehicle operation

# Storage Comparison - 5kg H<sub>2</sub> Storage Index

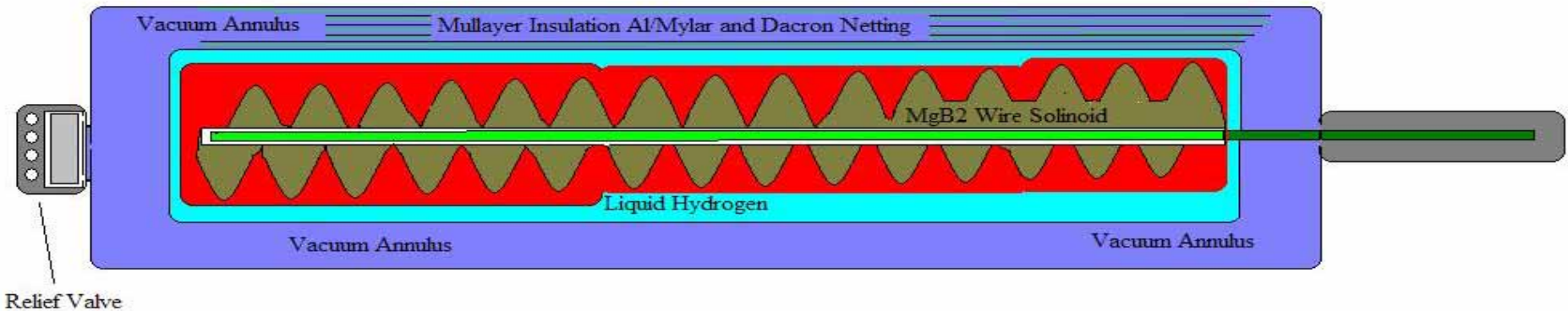


# 13,000 gal Liquid Hydrogen Storage Tanker





# Superconductivity Magnetic Energy Storage System

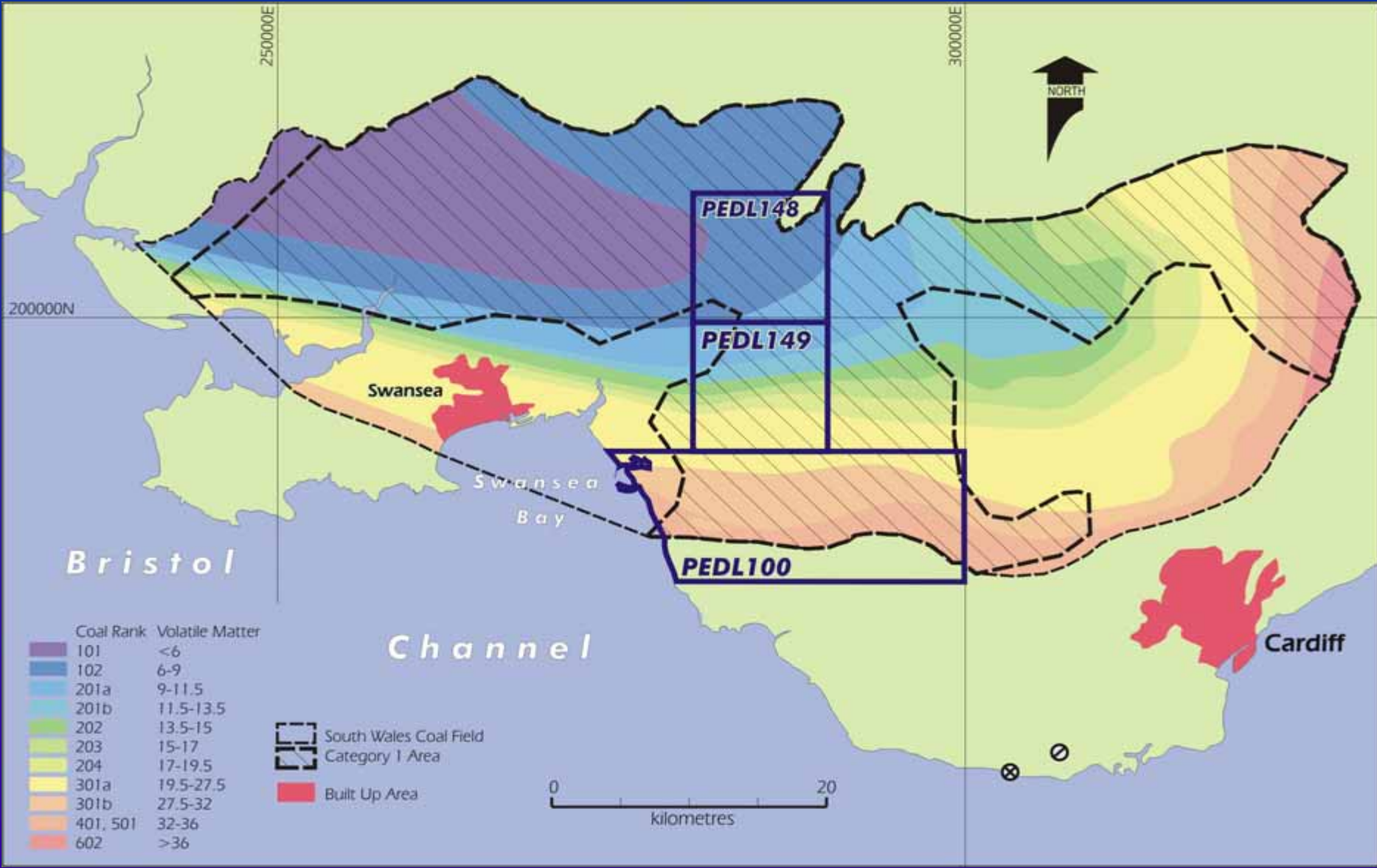


## SMESS Battery

Cryogenic container and method for shielding a cryogenic fluid to make a superconductivity magnetic energy storage system (SMESS)

# **South Wales Coal Bed Methane & Petroleum**

# South Wales Coal Rank and Volatile Matter





# South Wales Coalfield & Potential Markets

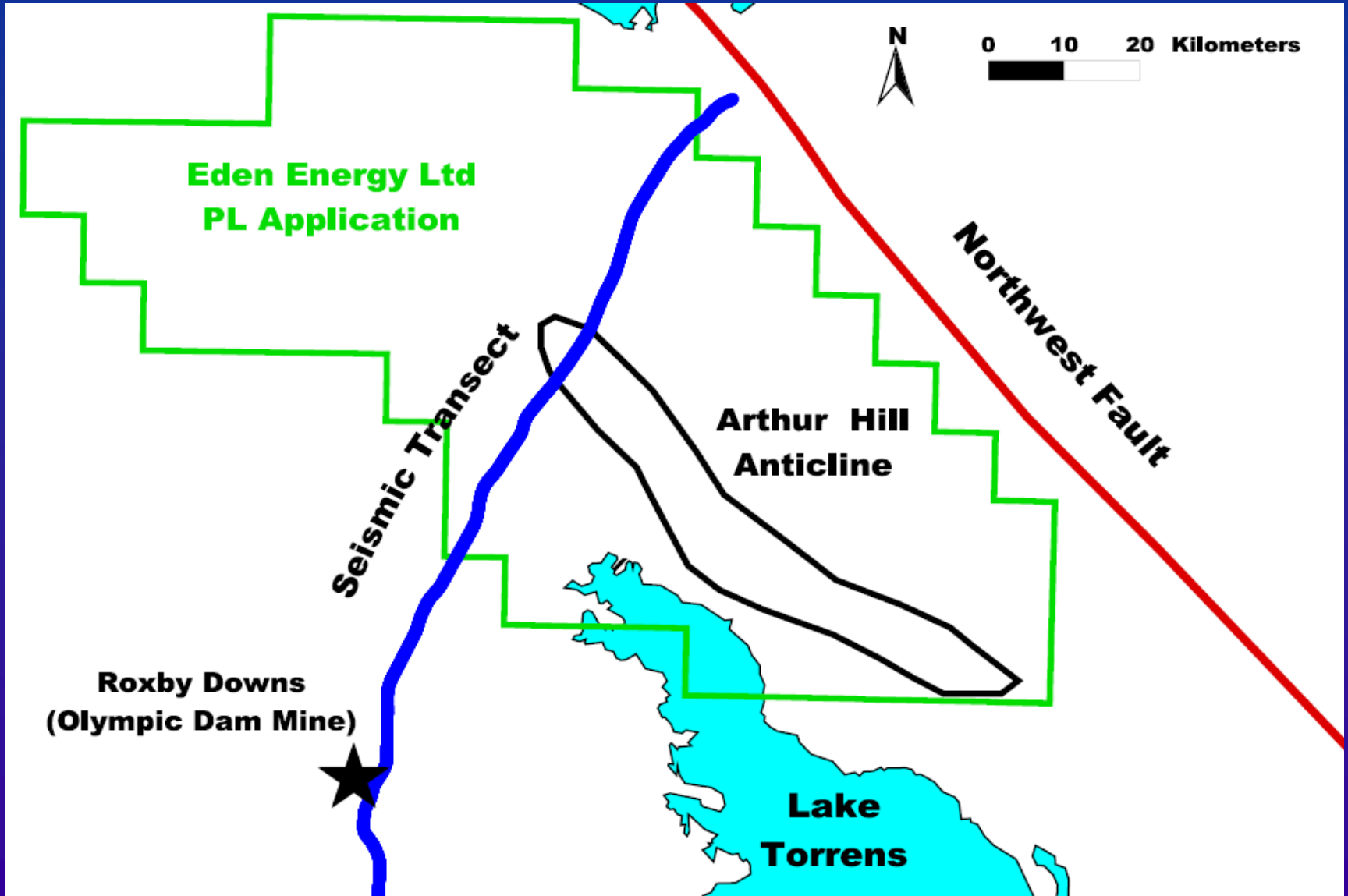


# South Wales Strategy

- Produce methane for use as Hythane<sup>®</sup>, gas or electricity
- Drilling and testing of CSM – Q1 2007
- Drilling AMM – Q1 2007
- Seismic survey - Conventional – Q1 2007
- AIM listing to raise funds for CSM/AMM/Conventional
- Drilling Conventional targets Q3/4 2007

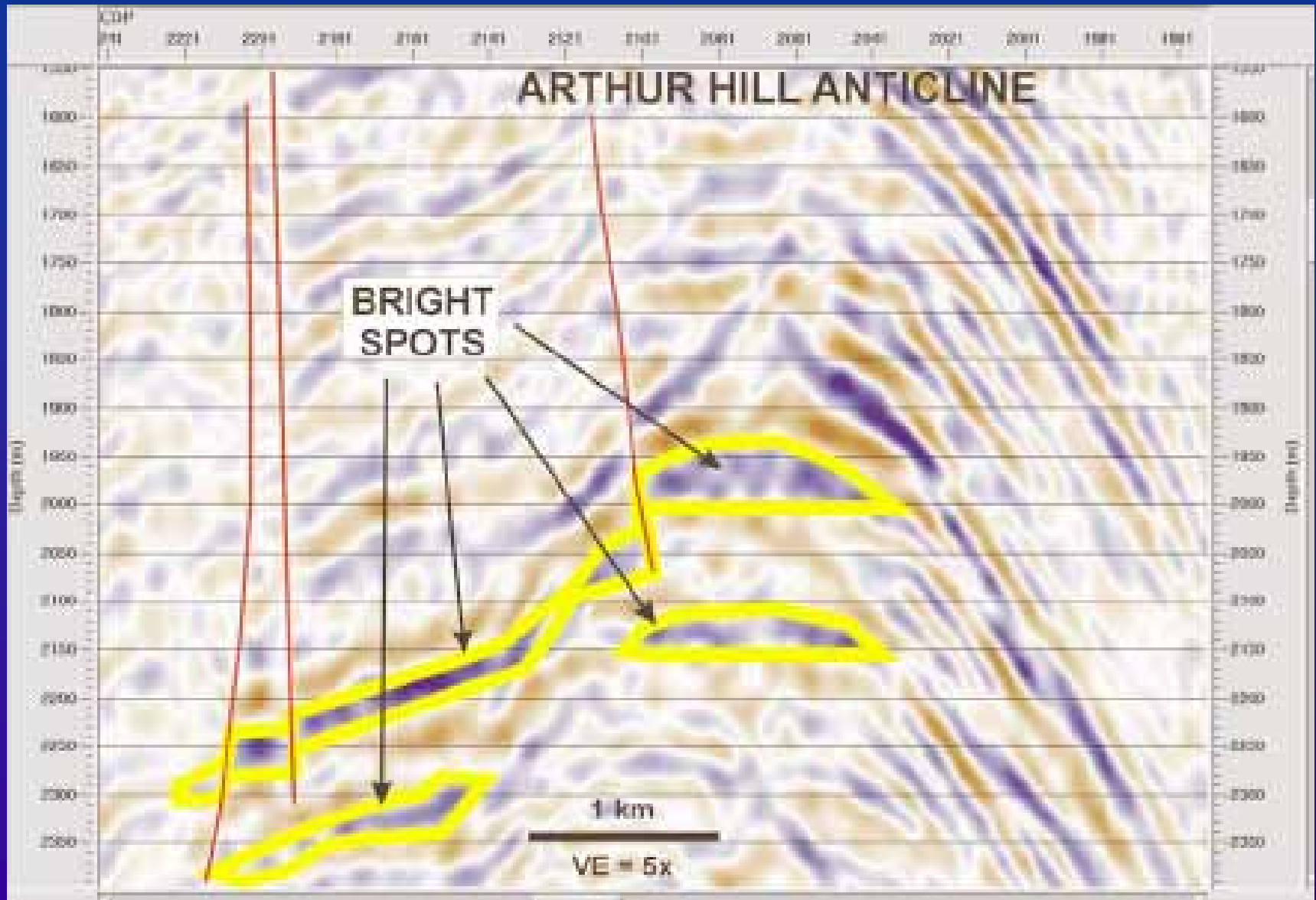
# South Australian Hydrocarbons

# South Australian Hydrocarbons





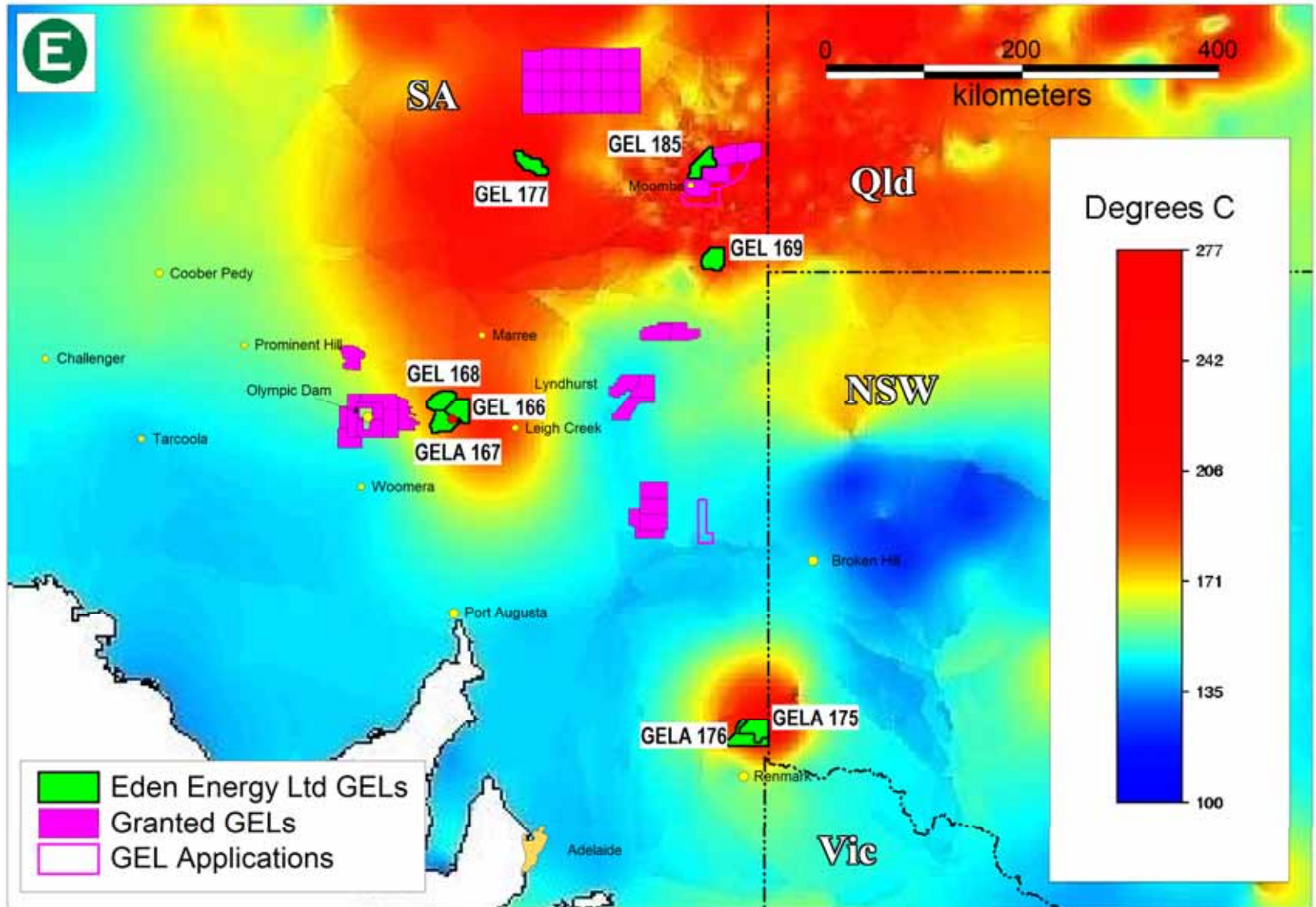
# Interpreted Gas pockets on re-processed seismic





# Geothermal Exploration

# Eden's SA Geothermal Exploration Targets



## Strategic Plan Highlights

- **HYDROGEN** – develop and market new technologies for production, use and storage of Hydrogen (H<sub>2</sub>)
  - Hythane<sup>®</sup> - India, US, Australia Rollout
  - Low-cost CO<sub>2</sub>-free H<sub>2</sub> production R&D
  - Cryogenic storage for Hydrogen, Hythane<sup>®</sup>, LNG
  - Portable superconducting battery (SMESS)
- **GAS Sth Wales** - CBM/CMM/Oil-drilling 2007
- **Hydrocarbons** - Sth Australia - drilling 2007
- **Geothermal Energy** - drilling 2007

# Projected Revenue Sources

## Early cashflow potential...

- Cryogenic division ( current)
- Hythane® - Revenue Targets

Engine conversions/royalties

Sales commission - controllers, engines and vehicles

Regional Franchise Fees - China, India, USA

Margin on Hythane® fuel

- South Wales gas
- Carbon Credits

# Capital Structure

ASX Code (Ticker)	EDE/EDEO
IPO amount	\$8.4M
Issue Price	\$0.20
Total Shares (EDE)	122.4M
Total Options (EDEO)	87.4M
Current Share Price (EDE)	25cents
Market Capitalisation	\$30.6M

## Summary

- Six major alternative energy projects
- Huge emerging Hythane® markets in India, USA, China
- World leading cryogenic technology and patents
- Low-cost CO<sub>2</sub>-free H<sub>2</sub> production R&D
- Major CBM project in Wales ready to drill test- major industrial markets
- Large untested hydrocarbon target
- Highly prospective geothermal licences
- Early cash flow potential from various projects