Partnerships and Business Driven Actions: From Melbourne to Berlin

Stakeholders Meeting
Carbon Sequestration Leadership Forum

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26 September 2005

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Key Messages

Public-private and intergovernmental partnerships, for example:

- CO2 Capture Project (BP, Chevron, Shell, Hydro, ENI, Petrobras, ConocoPhillips, Suncor)
- Carbon Sequestration Leadership Forum (CSLF)
- Methane-to-Markets

have the potential for facilitating:

- Demonstration projects and technology collaborations
- Technology transfer
- Progress towards widespread, commercial deployment of new technologies

Key Messages

CSLF can further facilitate defining roles and responsibilities of member nations, their industries and research institutions, in contributing to the research, development, deployment of CO2 capture and storage

Key issues still remain, especially on:

- National policies and incentives
- Public awareness and acceptance
- International conventions

Key Messages

National policies should:

- Take into account project-specific factors that enable success of commercial projects – predictability, transparency, costs of policies and regulations
- Increase certainty in criteria for decommissioning and do so early in project approval
- Limit long term liability post-closure (i.e., after decommissioning)
- Continue to provide incentives for R&D for new technologies to lower costs of capture, storage, monitoring

Key Messages

Public awareness and acceptance

- Needs NGOs and industry to share key roles in educating the public about CO2 capture and storage
- Key message needs to be developed around the facts of transport and storage integrity

International conventions (e.g., London, OSPAR)

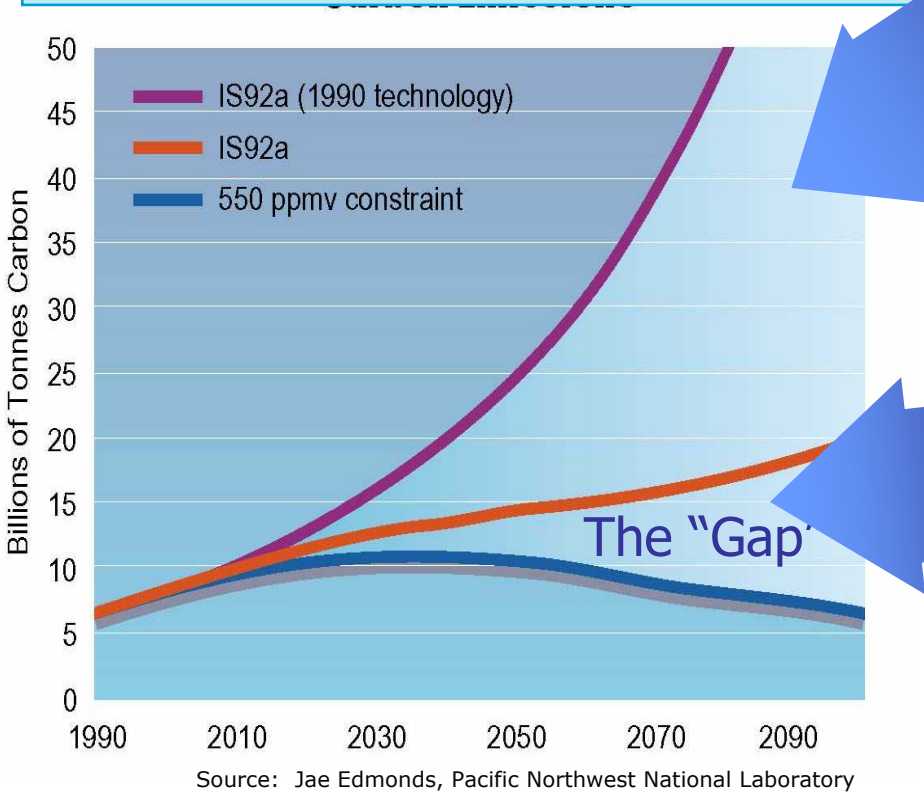
- Parties to the conventions need to cooperate to clarify key issues that are potential barriers for widespread deployment

Signposts on the Road from Melbourne to Berlin

- The Kyoto Protocol entered into force 16 February 05
- EU Emissions Trading system began operation Jan 05
- EU market is seeing increasing trading activities. Forwards dominates now.
- Clean Development Mechanism Executive Board registered its first projects which, subject to monitoring provisions and certification, will likely see the issuance of credits in a year's time
- Some US states are continuing their plans on regional greenhouse gas emissions trading
- Canada is continuing its policy development, including trading. Canada signed agreement with automobile manufacturers to reduce emissions by 5.3 million metric tons per year by 2010.

Broad Portfolio of Energy and Emissions Reduction Technologies

CO2 capture and storage technology is critical in providing future energy and reducing emissions beyond any "business as usual" (IS92a) emissions scenarios to a world of 550 ppm greenhouse gas concentration.*



Source: Jae Edmonds, Pacific Northwest National Laboratory

Assumed Advances In

- Fossil Fuels
- Energy intensity
- Nuclear
- Renewables

Gap technologies

- CO2 capture & storage
- H2 and Advances in Transportation
- Biotechnologies (e.g., Bioenergy)

* 550 ppm is the focus of United Nations negotiations for long term emissions reductions

Technology and Policy Drivers

G8 Gleneagles Plan of Action on Climate Change, Clean Energy and Sustainable Development recognizes that advances in a portfolio of technologies are critical for the stabilization of greenhouse gas concentrations.

Technology common ground

- G8 nations disagree over the Kyoto Protocol
- G8 Plan of Action is the common ground.

In the CO2 capture and storage technology area, G8 Gleneagles Plan of Action commits the nations to:

- Acceleration of the development and commercialization of carbon capture and storage (CCS) technology by endorsing the objectives and activities of the Carbon Sequestration Leadership Forum (CSLF)
- Working with the IEA and the CSLF to hold a workshop on short-term opportunities for CCS in the fossil fuel sector, including from enhanced oil recovery and CO2 removal from natural gas production
- Collaboration with key developing countries to research options for geological CO2 storage

CO2 Capture and Storage Technology in Chevron's Portfolio

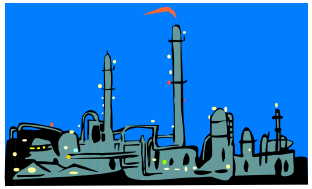
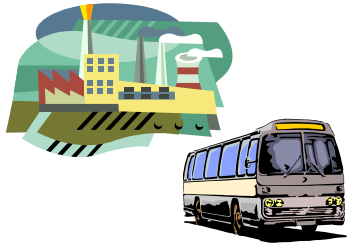
- Being a leader in CO2 capture and storage technology is an essential element of Chevron's medium- to long-term GHG emissions management strategy.
- This focus on CO2 capture and storage technology deployment reflects our pragmatic, action-oriented approach to advancing energy technologies.
- This focus emphasizes finding new ways to produce cleaner, lower-carbon energy from fossil fuels today, while at the same time developing a portfolio of advanced energy and infrastructure technology necessary for an emerging hydrogen economy in the long term.

Business-Driven Actions on Greenhouse Gas Emissions Management

- **Strong Centralized Greenhouse Gas Management**
- **Management Processes and Tools Integrated to Business**
- **Carbon Markets Team**
- **Partnerships**

Importance of Climate Change Issue to Chevron

CO_2 and methane emission sources

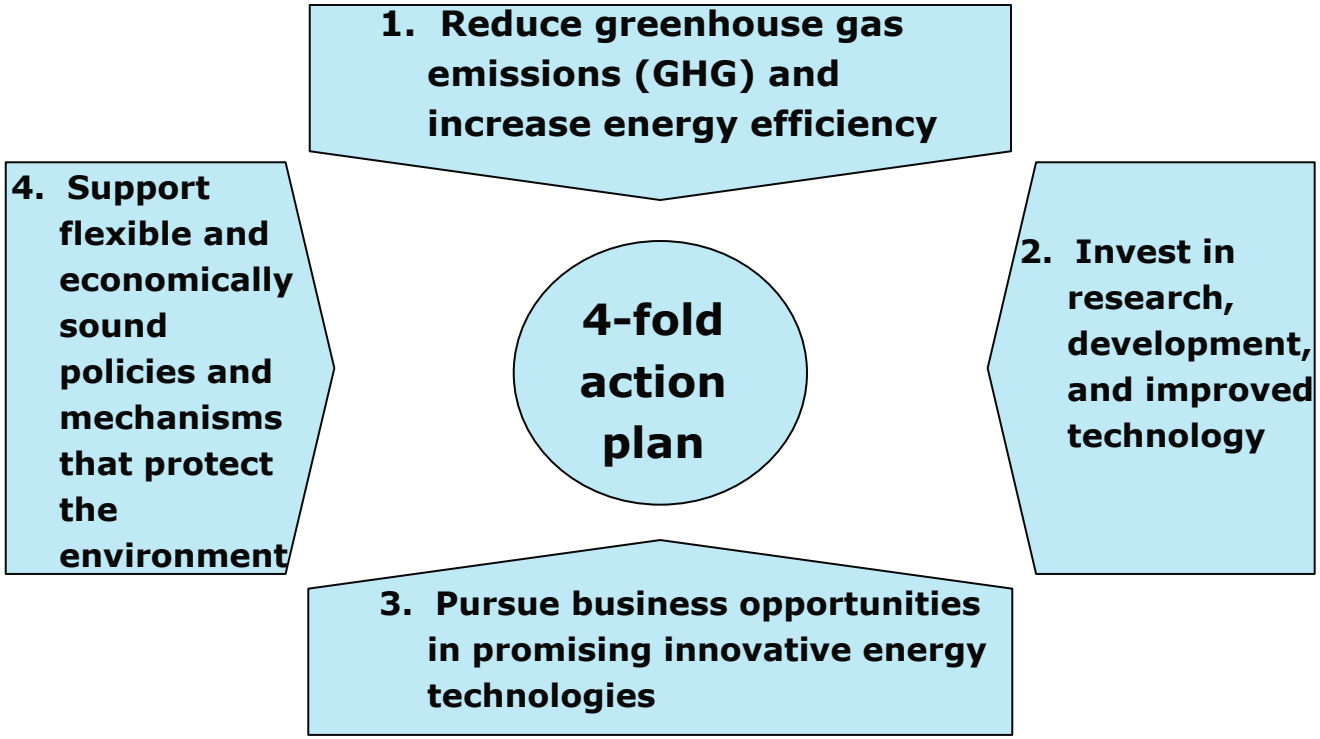
	Production	Transportation	Refining and Petrochemical Production	End Use
				
Sources	■ Combustion and rotating equipment, flaring, venting ■ Gas associated with oil production	■ Pipelines ■ Vessels ■ Vehicles	■ Heaters ■ Boilers	■ Customer use of gasoline, diesel, and coal
Emission	■ CO_2 ■ Methane	■ CO_2 ■ Methane	■ Primarily CO_2	■ CO_2

Four-Fold Plan of Action

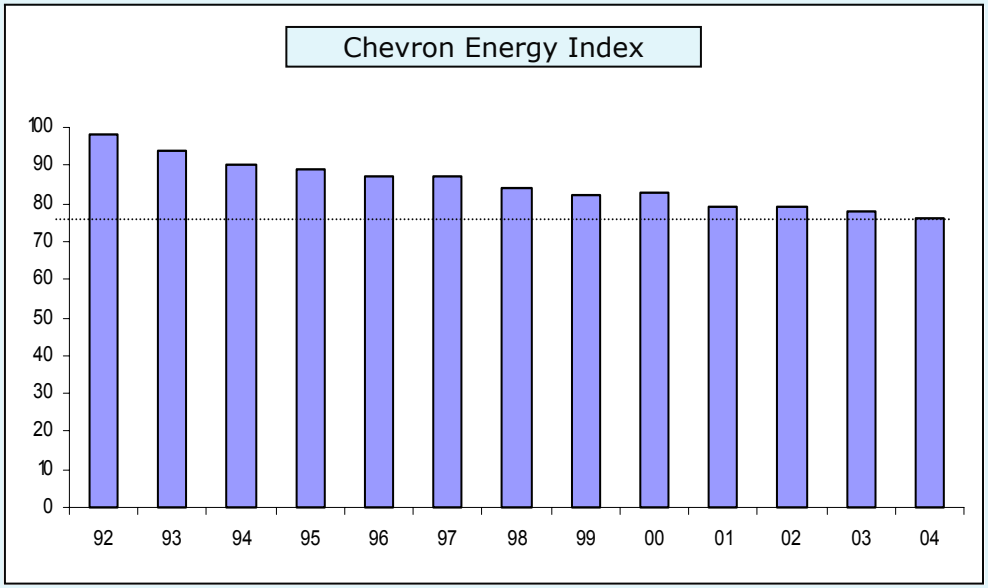
Position

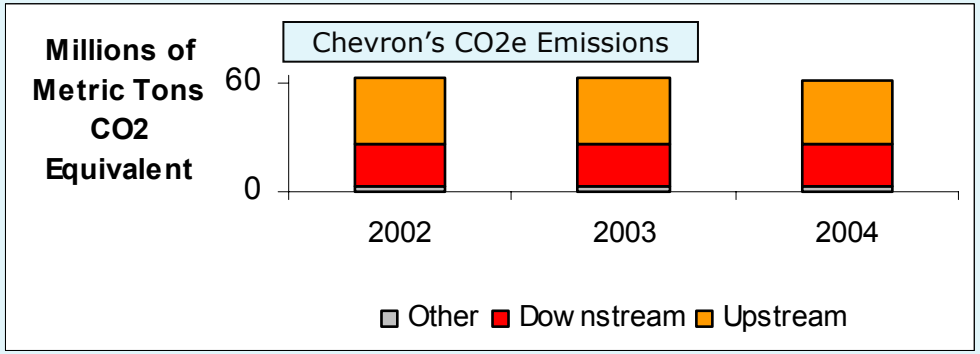
Plan

- We at Chevron Corporation are responding to increasing climate change concerns by integrating an action-based approach into our business strategy
- 4-Fold Plan predicated on ***ACTION***



Measurable Results





Note: 2002, 2003, and 2004 Equity share emissions do not include Chevron Phillips Chemical and Dynegy. Other includes shipping, power & gasification, coal & corp. services

- Chevron's energy efficiency improved 24% from 1992. U.S. refinery plans an additional 10% improvement by 2012.
- Chevron's operating companies have set greenhouse gas emission goals for 2005, and forecast 2005-07
- Greenhouse gas emissions accounting has become standardized – Chevron's SANGEA™ software has the key role
- Capital projects are required to project greenhouse gas emissions and analyze mitigation options.
- Chevron's Climate Change Steering Council oversees all aspects of the climate change issue.

Greenhouse Gas Emissions Management at Chevron Corporation: Path Forward

World Class Performance

Focused Improvement

Foundation

SANGEA™

Data Collection

Emissions Trading

Energy Efficiency

Forecasting Tools

GHG Planning in Capital Projects

Sharing Best Practices

Signpost and Scenario Analysis

Technology Assessment Tools

Long Term Emissions Strategy

Long Term Forecasts

External Reporting

Standardized Accounting

The Road from Melbourne to Berlin

Chevron continues to:

- Foster climate change-related Joint Industry projects
- Encourage business units' actions in support of Chevron's Four-fold Action Plan -- several examples:
  - The Gorgon Project
  - Chevron Energy Solutions
  - Chevron Technology Ventures
- "Practical Hydrogen" – hydrogen infrastructure development

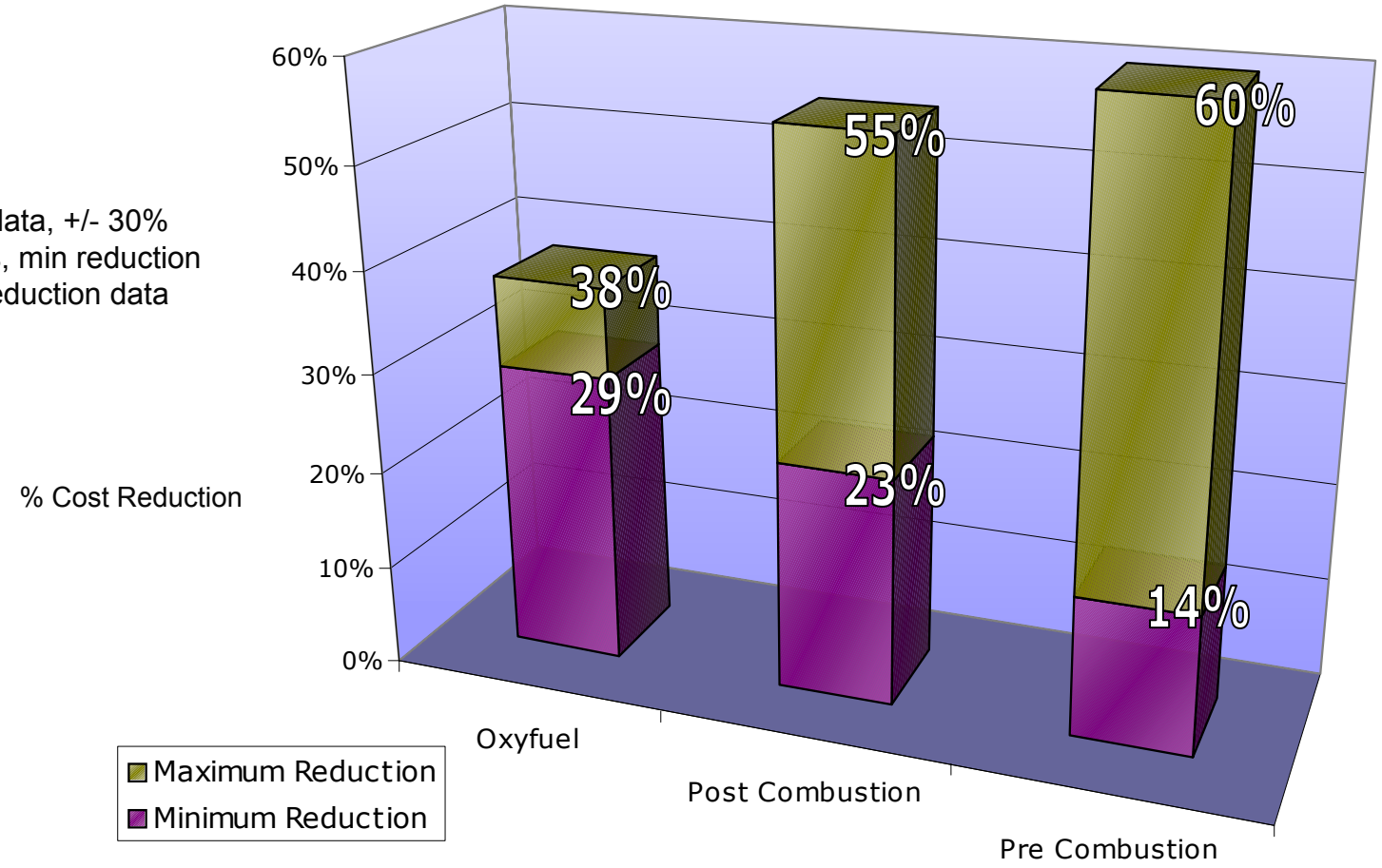
Climate Change Related Joint Industry Projects

- CO_2 Capture Project
- CO_2 Cooperative Research Center
- International Energy Agency - Weyburn
- Gulf Coast Carbon Center
- MIT's Carbon Sequestration Initiative
- WestCarb (U.S. Dept. of Energy Regional Partnership)
- Global Gas Flaring Reduction Partnership
- Industry Consortia: API, IEA, IPIECA, CO2NET

CO_2 Capture Project Phase 1

Capture: CO2 Avoided Cost Reductions*

* Preliminary data, +/- 30% cost estimates, min reduction & maximum reduction data points shown.



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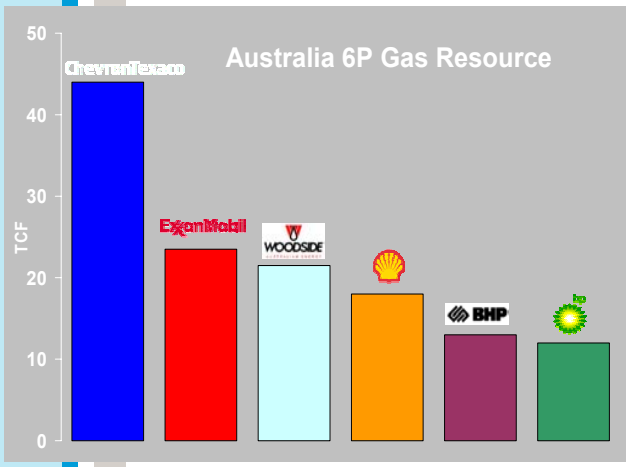
CO2 Capture Project Phase 1

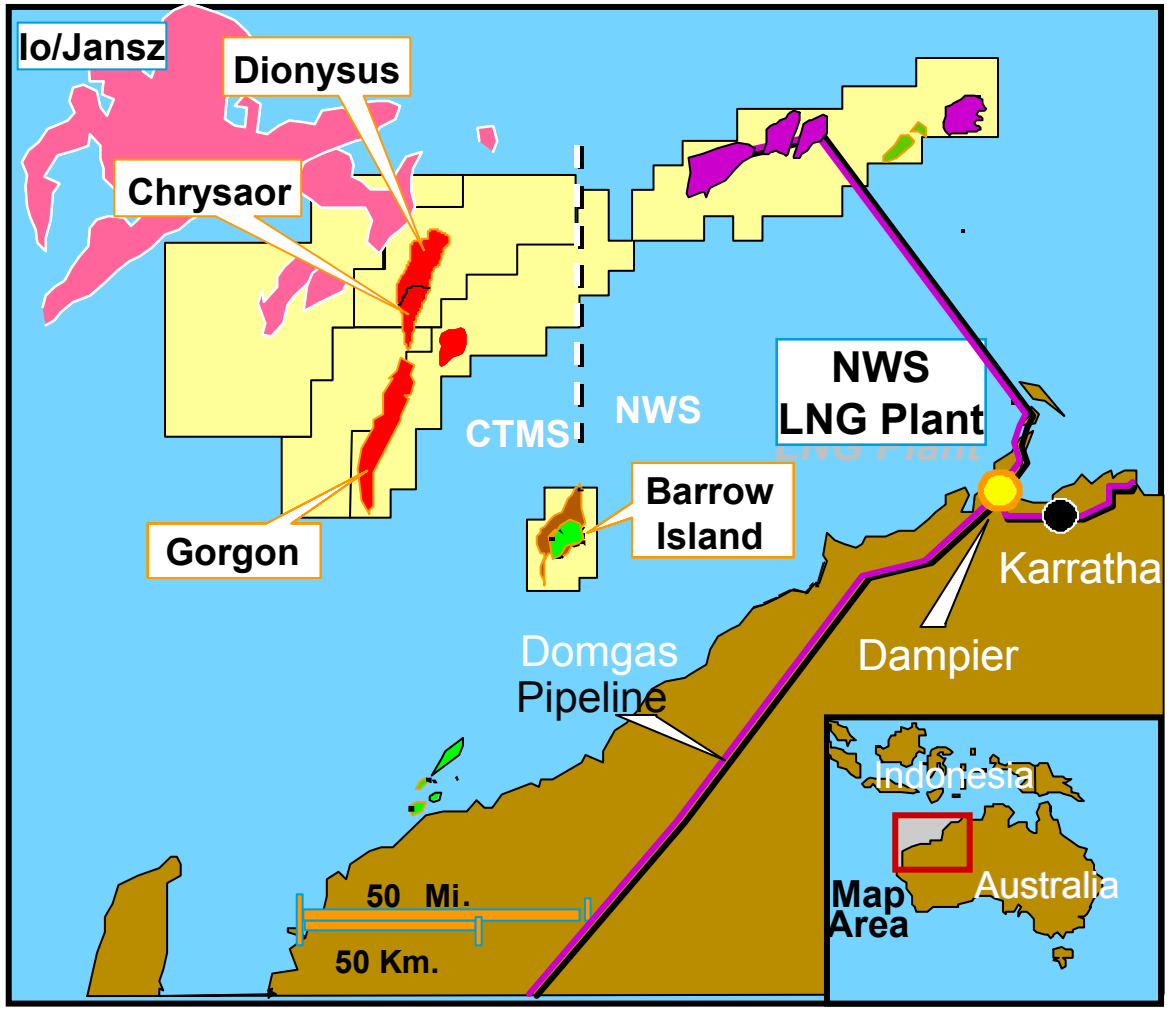
Storage

- Developed a comprehensive understanding of the health, environment and safety risks of, and the requirements for, secure geological storage
- Developed an extensive repertoire of monitoring options, applicable to a broad range of settings
- Potential leakage scenarios have been mapped and matched to remediation actions

Australia: Vast Resources Offer Clean Fuels Promise and GHG Advances

- CVX is 1/6 Equity Owner in NWS LNG Venture
- CVX is also Operator and Lead Developer of Gorgon LNG with more than 40 TCF in Greater Gorgon area.





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Greenhouse Gas – the Gorgon commitment

Gorgon CO_2 sequestration will be the largest such project in the world.

It will be managed through:

- Greenhouse Gas Management Strategy
- Environment, Social and Economic Review commitments
- Greenhouse Gas Management Plan
- Environmental Impact Assessment process (EIS/ERMP)

"Greenhouse gas management is part of our business"

GORGON
AUSTRALIAN GAS

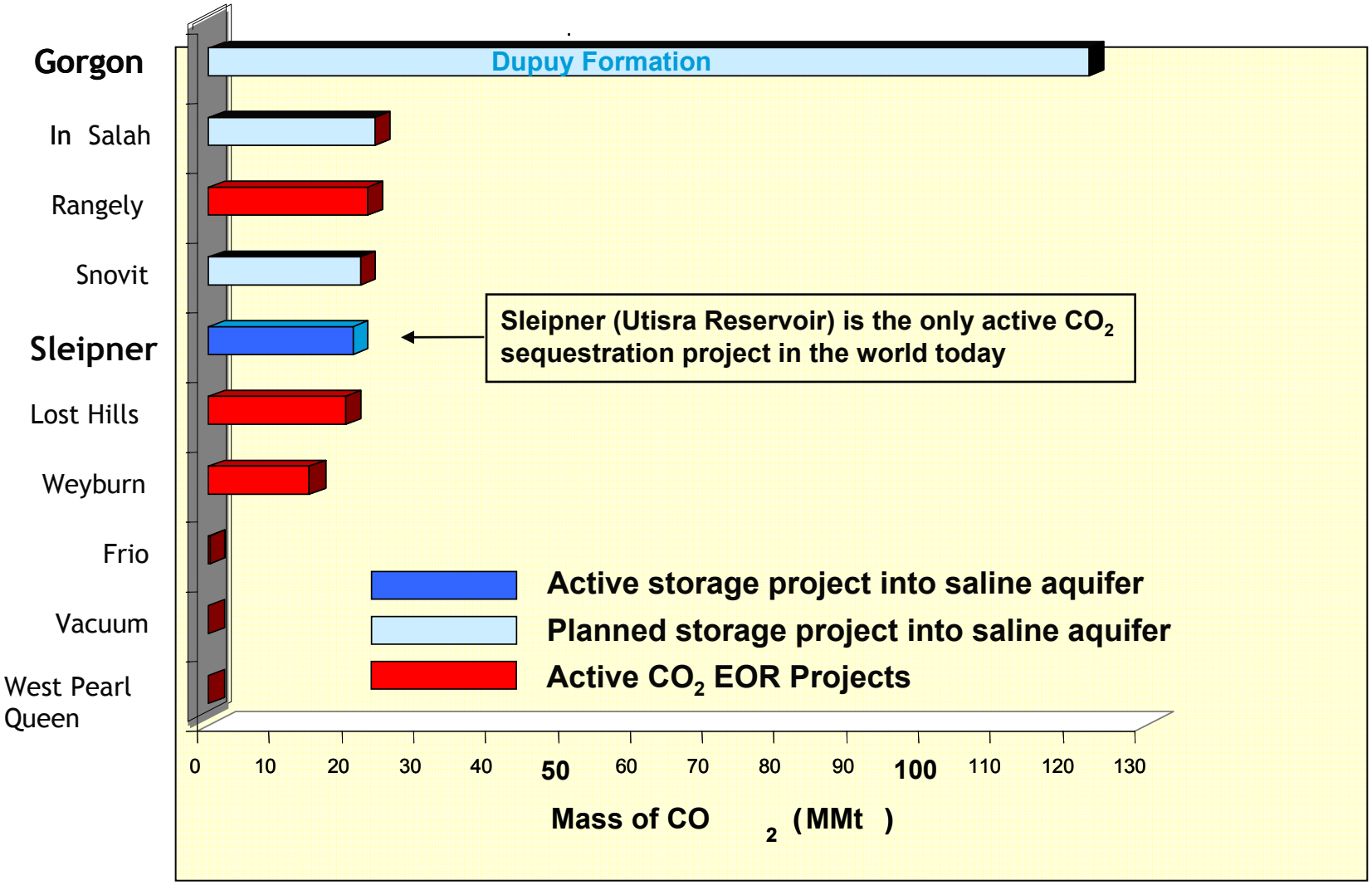
Gorgon Gas Development Greenhouse Gas Management Strategy

The Gorgon Development Greenhouse Gas Management Strategy for a Barrow Island development is to:

- Demonstrate via lifecycle analysis that a Gorgon gas development and LNG export results in a net reduction in global greenhouse gas emissions relative to other fossil fuel alternatives.
- Design the production facilities to incorporate current best practices in thermal efficiency and greenhouse emission control where practicable.
- Develop a project to re-inject the removed reservoir CO_2 into the Barrow Island Dupuy saline reservoir, unless it is technically infeasible or cost-prohibitive. This will involve:
  - Pursuing a stepwise process to: develop a reservoir CO_2 re-injection project, demonstrate technical feasibility, and ensure costs to the project are not excessive.
  - Selling treated gas to meet domestic gas customer requirements and re-inject the removed reservoir CO_2.
  - Commencing re-injection as soon as practicable after the processing facilities commissioning and start-up process.
  - Implementing re-injection of reservoir CO_2 by installing a single train of injection equipment, sized for the full volume of reservoir CO_2.
- Investigate potential synergies with existing Barrow Island operations and implement measures that minimise greenhouse emissions and enable full use of associated gas production where practicable.
- Pursue projects and opportunities which provide net conservation benefits and enhance greenhouse gas removal from the atmosphere.
- Continue existing funding for greenhouse gas related research and development projects such as CRC's and technological research.
- Review options for funding additional value-added research and development or demonstration projects.
- Pursue potential opportunities for external sale or use of separated reservoir CO_2 as a chemical feedstock or enhanced oil recovery agent.
- Develop a contingency plan that could provide a partial offset for reservoir CO_2 if a sequestration project proves infeasible. Options may include:
  - Maturing alternative re-injection sites that could be developed in the future such as a depleted gas reservoir.
  - Creation of emission reductions or offsets external to the Gorgon gas development.
  - Sequestration opportunities such as forestry.
  - Additional research funding.
- Meet the commitments within the LNG Action Agenda including the revision of the existing Gorgon Greenhouse Challenge Cooperative Agreement.
- Continue to advocate increased use of gas based fuels, in preference to more carbon intensive options, to reduce greenhouse emissions.
- **Participate constructively in the development of greenhouse policy at both the State and Commonwealth level.**

Paul Oen
Gorgon Area General Manager

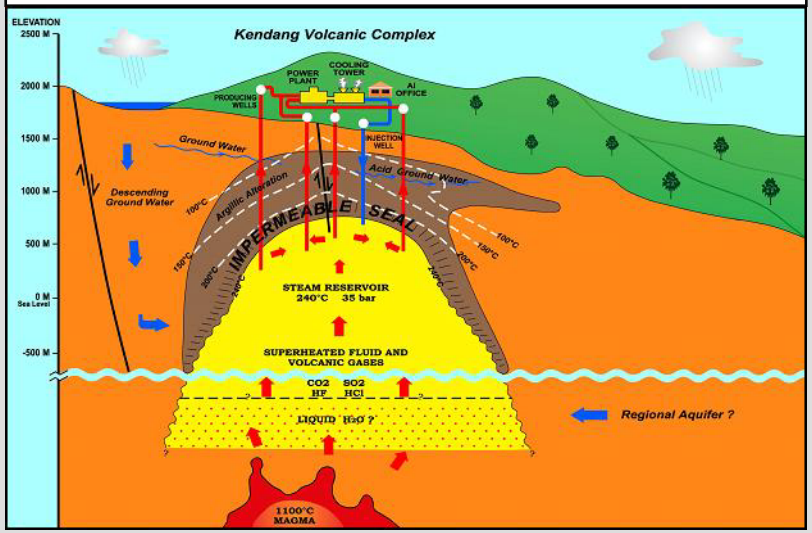
Comparison of Global CO_2 Re-Injection Projects

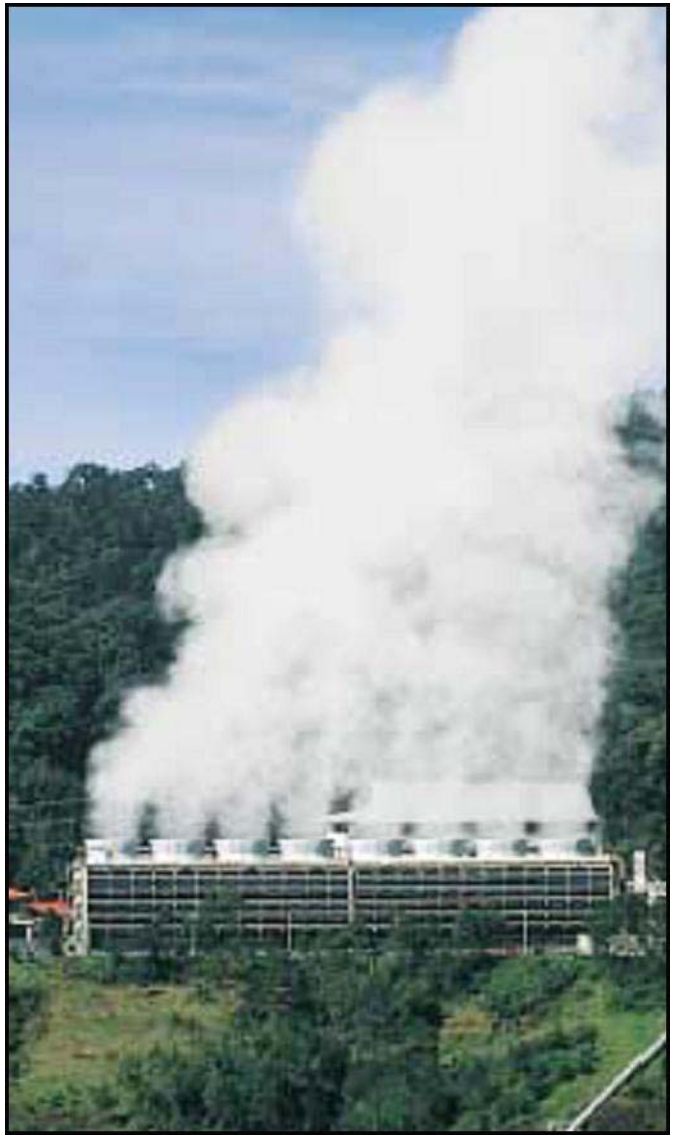


Indonesia's Darajat Geothermal Expansion

Darajat

- **110 MW Expansion of Darajat geothermal power project**
- **Resource operated by Chevron Energy Indonesia Ltd (CTEI)**
- **Will help meet electricity demands of Java, Madura and Bali, where supply shortages are anticipated**
- **Darajat's geothermal resources are abundant, clean, renewable**
- **Will help Indonesia avoid more than ~400,000 tons per year of CO_2 emissions**





Chevron Energy Solutions – Energy Efficiency Project (US Postal Service, West Sacramento, CA)

Chevron Energy Solutions - Solar Photovoltaic Installation (Public Library, City of Richmond, CA)

Technology Ventures: Renewable Energy Systems

Solar Mine project in the Midway-Sunset heavy oil field

Renewable energy systems integrated into oil field operations

Advanced Batteries

- The power behind hybrid vehicles
- COBASYS has completed construction of an NiMH Battery Plant

- COBASYS signed a cost-sharing contract to continue the development of NiMH batteries under the sponsorship of the U.S. Department of Energy's FreedomCar initiative

New Manufacturing Facility
Springboro, Ohio

U.S. DOE Hydrogen Fleet & Infrastructure Demonstration & Validation Project

- 5 year project to showcase practical application of H2 technology. Chevron is consortium leader and fuel supplier; Hyundai-Kia Motors the vehicle supplier; and UTC Fuel Cells will supply the FC stacks
- Develop and demonstrate safe, convenient, reliable H2-based distributed power generation, FCVs and vehicle fueling infrastructure
- Educate key audiences about H2 as potential fuel for transportation and power generation
- Sites and fleet operators: HATCHI, SoCal Edison, AC Transit and U.S. DOD
- Fueling for up to 32 H2 FCVs
- Integrated Codes & Standards, Education & Outreach Plans

Opportunities in Early Markets for Hydrogen

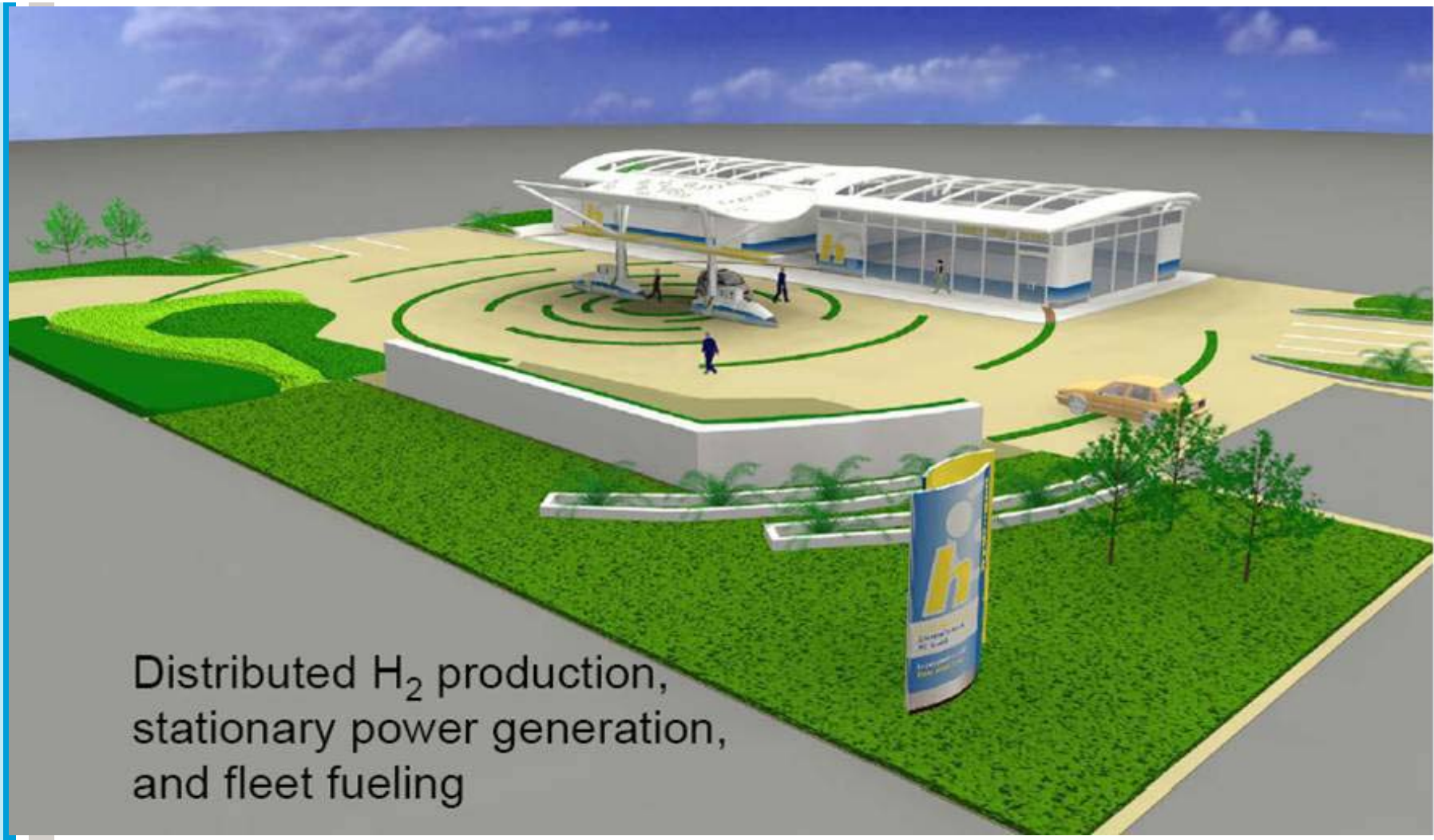
High-Quality Distributed Power

- Fuel cell installation in Bellaire, TX and San Ramon, CA

Vehicle Fleets

- AC Transit Fuel Cell Bus Program
- US Department of Energy Project

The Hydrogen Highway: moving to the next phase



The Hydrogen Highway: moving to the next phase (18 February 2005)

Chino, California

Hydrogen Fueling Dispenser

Unveiling at Chino, California

Groundbreaking at Orlando, Florida

Business-Driven Actions on Greenhouse Gas Emissions Management

Strong Centralized Greenhouse Gas Management

- Executing the Four-Fold Action Plan
- Climate Change Steering Council

Management Processes and Tools Integrated to Business

- Carbon management systems integrated into business planning
- Multiple emissions-reducing project activities

Carbon Markets Team

- Centrally coordinates trading and credit activities worldwide

Partnerships

- Key opportunity areas to address technology and business development

