

ChevronTexaco CO₂ Capture and Storage Experiences and Technology Development

Arthur Lee
Carbon Sequestration Leadership Forum
Melbourne

13-15 September 2004

Key Messages

Assessing the progress of the Carbon Sequestration Leadership Forum

Encouraged by the

- Leadership shown by the participating nations
 - Raising the awareness of this important technology option
- Increasing level of interest in the potential widespread deployment of CO₂ capture and storage technology
- Frank discussions and formulation of the draft paper “Regulatory Considerations for Carbon Dioxide Capture and Storage Projects.”

Key Messages

CSLF has the potential for:

- Facilitating actual demonstration projects and technology collaborations between nations
- Facilitating technology progress with the technology roadmap
- 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 and incentives:

- Take into account factors that enable success of commercial projects – predictability, transparency, costs of policies and regulations. Project-specific factors need to be considered in policy-making.
- Continued incentives for R&D for new technologies to lower costs of capture, storage, monitoring

Public awareness and acceptance

- NGOs and industry share key role in educating the public

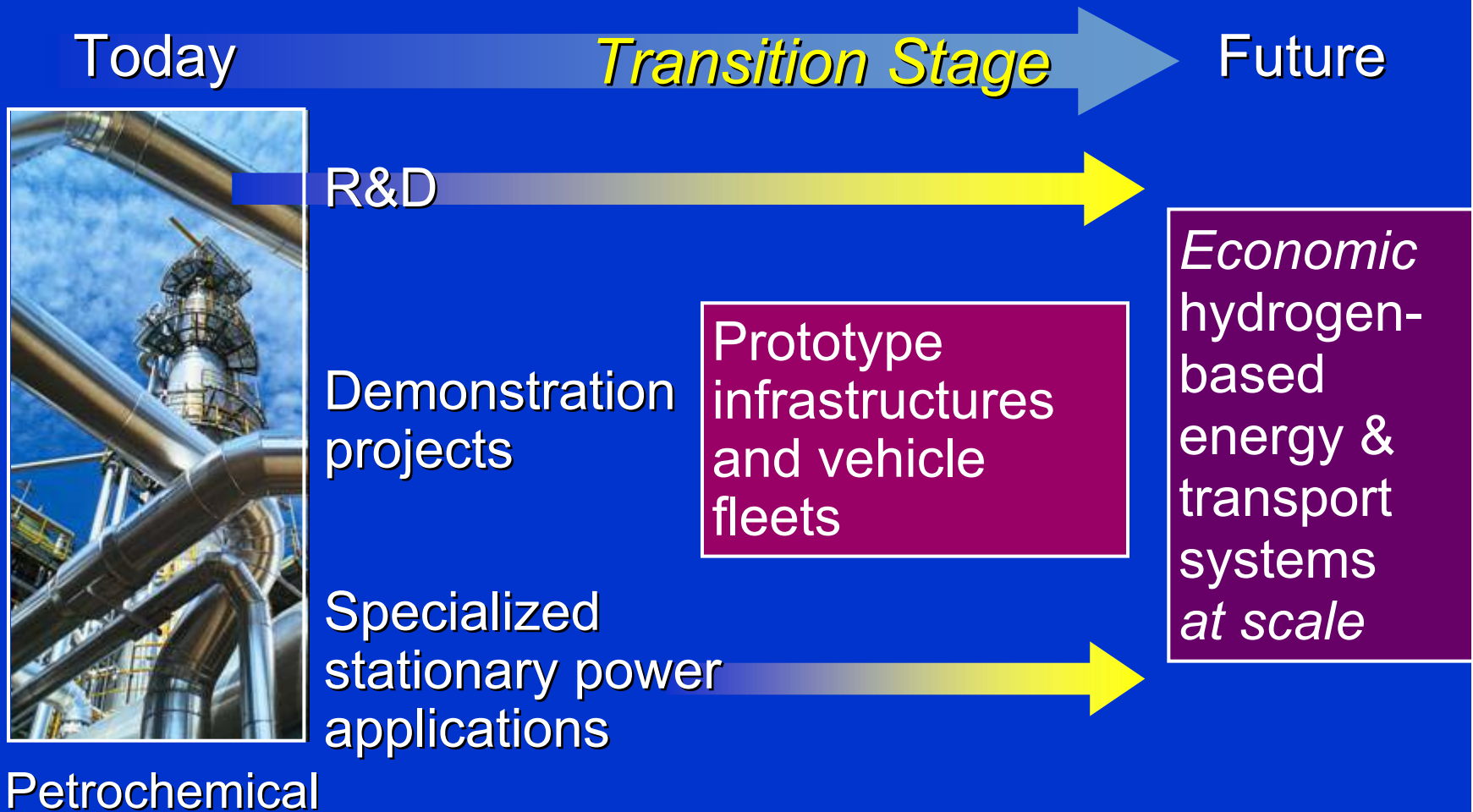
International conventions

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

CO2 Capture and Storage Technology in ChevronTexaco's Portfolio

- Being a leader in CO2 capture and storage technology is an essential element of ChevronTexaco'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 renewable energy and infrastructure technology necessary for an emerging hydrogen economy in the long term.

Viable strategies for the transition



ChevronTexaco Experience in CO2 Capture and Storage Technology

- ChevronTexaco has long experience in CO2 injection in enhanced oil recovery projects. In one facility alone in Rangely Colorado, we have been injecting CO2 safely since 1986 and we estimate that more than 22 million tonnes of CO2 are now stored in the geologic formations.
- Founding member of the CO2 Capture Project
 - \$50 million technology development project with US, EU, and Norwegian government support
- Member of the Weyburn CO2 Monitoring Project
- Member of the CO2CRC Australia.
- In-kind contributions to GEOSEQ
- Member of the MIT Carbon Sequestration Initiative
- ChevronTexaco is an active participant in the IPCC Special Report process, which is gathering the world's technical experts to assess the technical and economic feasibility for the widespread deployment of CO2 capture and storage technology.



Water Alternating Gas (CO2) Injection
Rangely, Colorado

Importance of Climate Change Issue to ChevronTexaco

CO₂ and methane emission sources



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

- CO₂
- Methane
- CO₂
- Methane
- Primarily CO₂
- CO₂

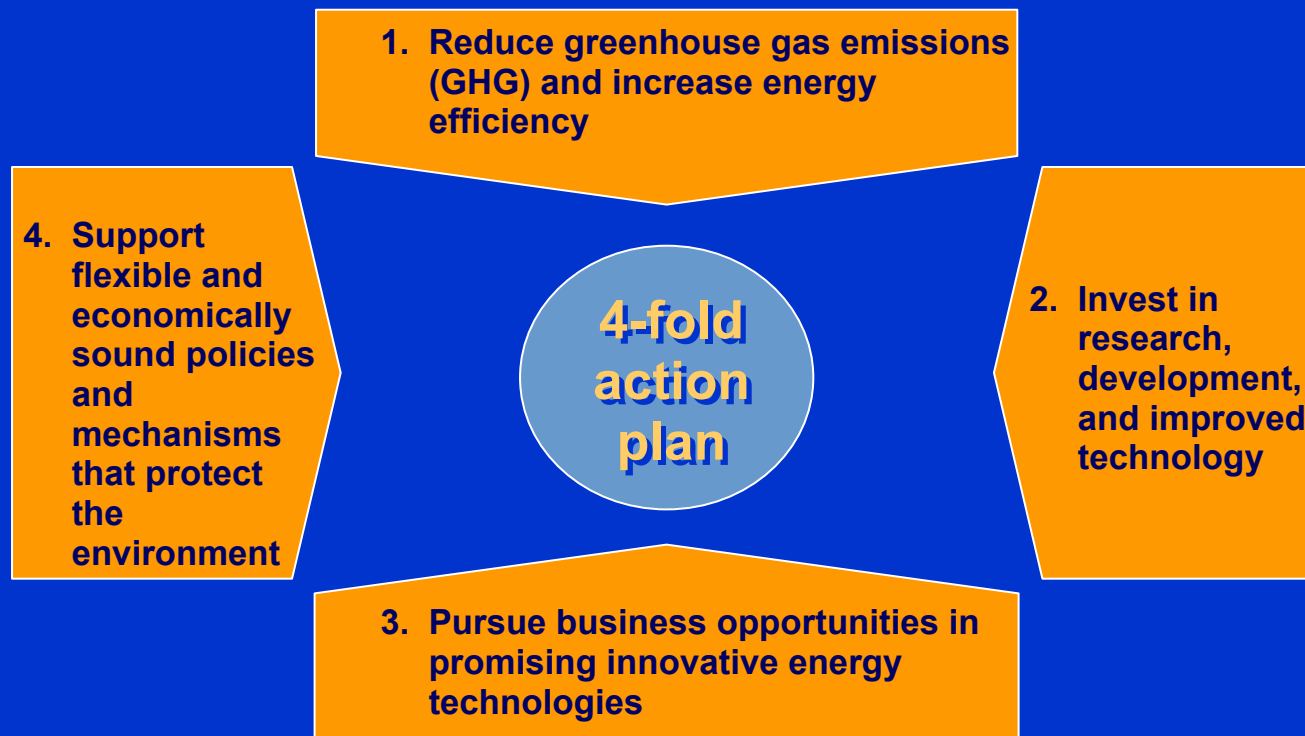
ChevronTexaco Climate Change Position and Plan

Position

We at ChevronTexaco are responding to increasing climate change concerns by integrating an action-based approach into our business strategy

Plan

4-Fold Plan predicated on **ACTION**

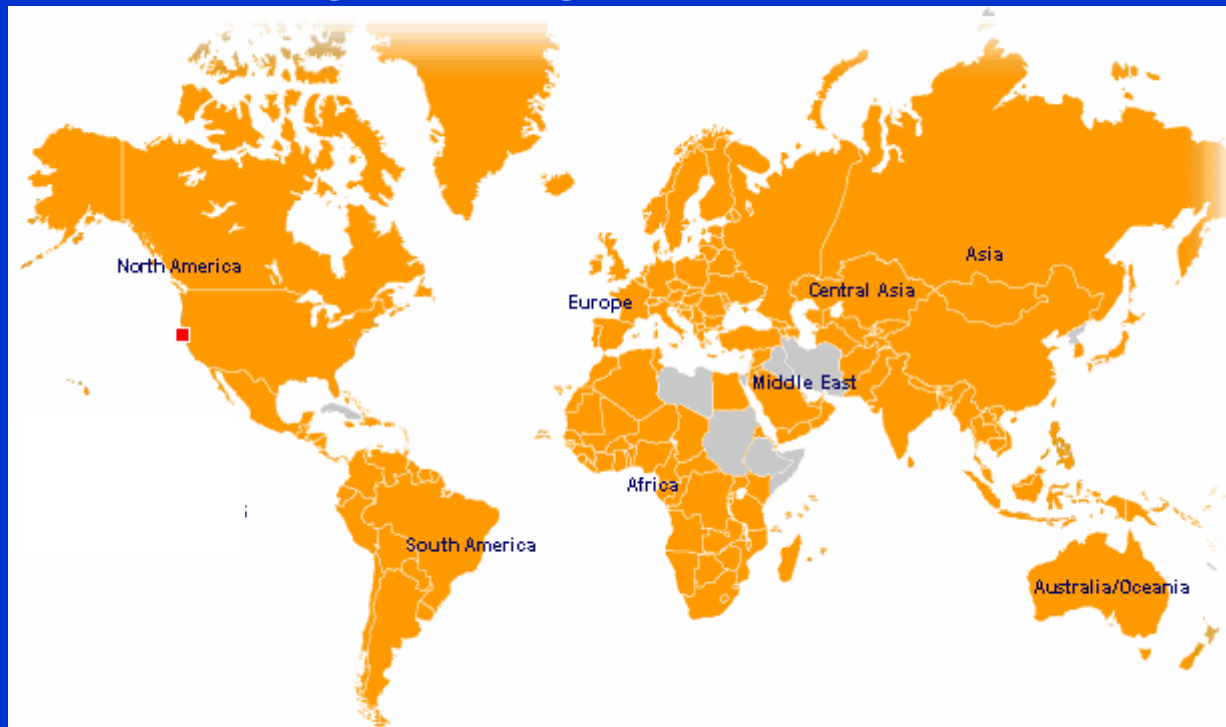


Mission of the Climate Change Steering Council

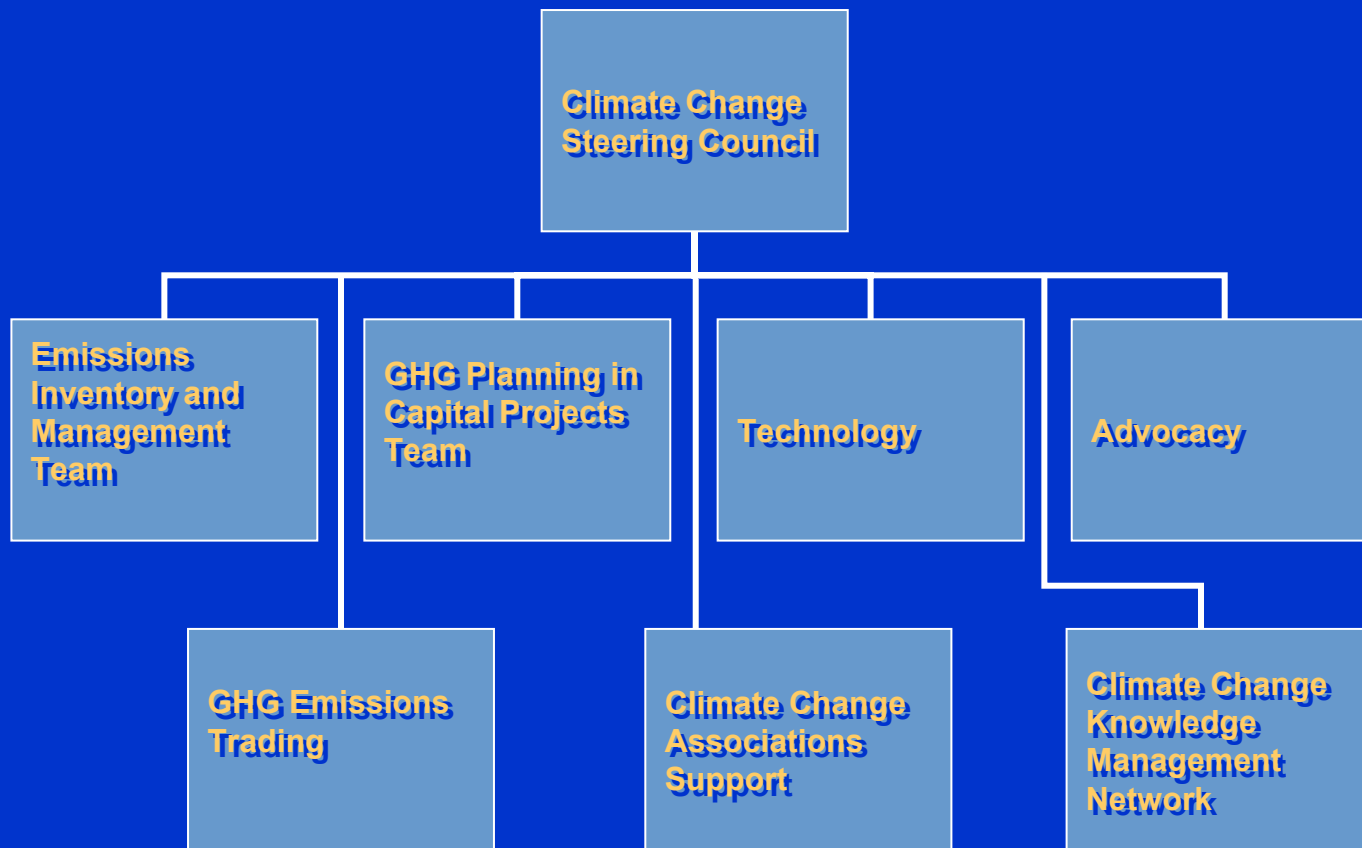
Mission

The ChevronTexaco Climate Change Steering Council coordinates activities, projects, and initiatives in order to share successful practices and to make recommendations to senior management

Climate Change Steering Council Representation



Organization of the Climate Change Steering Council and Supporting Teams



- Additional teams will be added as needed

Greenhouse Gas Emissions Management at ChevronTexaco: Path Forward Aspirations



Objective and Key Actions Related to Emissions Teams

Objective

Emissions Inventory and Management Team

- Provide emissions inventory and management, technical expertise, data analysis and tools development for ChevronTexaco

Key actions

- Develop and provide free to the energy industry SANGEA™ state-of-the-art software to collect ghg emissions data enterprise wide
- Conduct 3rd Party Evaluation of Protocol and SANGEA™ methodology.
- Member of World Bank Global Gas Flaring Partnership
- Project emissions management (Tengiz, Gorgon)

GHG Emissions Trading Team

- Early identification of emissions trading issues to determine business value of potential opportunities
- Seek business opportunities including:
 - Develop global GHG emissions trading capability with emphasis on EU
 - Emission credits from projects (Geothermal, Refinery Fuel Switching, West Africa Gas Pipeline, Flaring reductions and associated gas reinjection in Nigeria and Angola)
 - Reforestation Projects
 - Enhanced Oil Recovery

Objective and Key Actions of Externally Focused Teams

Objective

Key actions

Climate Change Associations Support Team

- Serve as forums to share information, gain insight on competitors and other industry sectors and influence external stakeholders
- Participate in associations including:
 - International Petroleum Industry Environmental Conservation Association
 - American Petroleum Institute
 - MIT Joint Program on the Science and Policy of Global Change
 - World Business Council for Sustainable Development
 - ARPEL – Latin America oil and gas association

Advocacy Team

- Advocate externally on key climate change policy issues, as determined by Climate Change Steering Council
- Advocate on policy issues including:
 - Voluntary registries being developed by US Federal Government and several U.S. states
 - GHG Emissions Trading and Clean Development Mechanism
 - CO₂ geological sequestration
 - GHG Protocol Standardization

Objective and Key Actions of Capability Building Teams

Climate Change Knowledge Management Team

Objective

GHG management in capital projects

- Develop and deploy a practical, useful process to screen, evaluate, and incorporate the impact of GHG emissions in capital projects

Technology Team

- Partner and support research and development of new technologies

- Facilitate sharing, capturing, creating, distilling, and sharing of climate change information across the enterprise

Key actions

- Align objectives for enterprise-wide consideration of GHG emissions:
 - Primer and Screening
 - Emissions Projector
 - Mitigation
 - Merger, Acquisition & Divestiture
 - Forecasting

- Partner with global energy companies on CO₂ Capture Project
- Support Australian development of geologic sequestration
- Support USDOE project on CO₂ monitoring methodologies
- Participate in MIT Carbon Sequestration Initiative, IEA GHG R&D Program, etc.

- Launch and maintain an electronic knowledge sharing network for
 - Global, Regional and National policy developments
 - Internal and external communiques
 - Web-site management

- Develop Renewables Portfolio