The Postmodern Oil Company
Here We Go Again?

Spot Price ($/B

Non-OPEC

OPEC

Spot Dubai

Saudi Arabia

Production (MMBD)


CRA

INTERNATIONAL
Refining is profitable for the first time in 20 years!

Figure 6: Refining Margins: 1992-2004
The world needs growing oil supplies, but will OPEC deliver?

Source: EIA, International Energy Outlook 2004
IOCs are finding that remaining resources are increasingly unconventional or inaccessible

**Proven Reserves (Bn BOE)**

<table>
<thead>
<tr>
<th>Stranded Gas</th>
<th>Fungible Oil &amp; Gas</th>
<th>Heavy Oil</th>
</tr>
</thead>
<tbody>
<tr>
<td>Qatar</td>
<td>Europe</td>
<td>Canada</td>
</tr>
<tr>
<td>380</td>
<td>500</td>
<td>310</td>
</tr>
<tr>
<td>Bolivia</td>
<td>Libya</td>
<td>Vzla</td>
</tr>
<tr>
<td>420</td>
<td>250</td>
<td>270</td>
</tr>
<tr>
<td>190</td>
<td>520</td>
<td>100</td>
</tr>
</tbody>
</table>

Labeled countries are examples of group
The eventual correction will be driven by end use efficiencies and a recycle through the resource pool.
Relative returns don’t explain enterprise value; growth prospects are becoming important.
Companies must “post-modernise” for disciplined growth

Refocus on Growth Metrics
- Emphasise ROCE and Reserve Bookings
- Balance Efficiency Improvement with Expected Value of Future Cash Flow Rights

Structure a Diversified Growth Portfolio
- Focus on Upstream Oil in Established Basins
- "Fill the Funnel” with Diverse Opportunities; Understand Optionality; Explain Portfolio Value and Risks

Manage Project Risk Down/ Value Up
- Negotiate a tough contract with supplier
- Enhance Local Stakeholder Benefits; Take a Systemic View

Rebuild the Capacity for Growth
- Capture Synergies through Functional Business Units and Technology Withdrawal
- Rebuild Growth Capacity with Integrated Gas/ Heavy Oil Supply Chains and Revitalised Technology Networks
A “Clean Sheet” Postmodern Organization proposal

Supply and Trading

- Risk Management
  - Supply Chain Integration
  - Trading

Traditional Mature

- Basin Ops
  - OECD Basins
  - Other mature operations
- Refinery Ops
  - “Non-integrated” refineries (Europe/NA)
- Established Market Retail
  - Retail in OECD, other established markets
- M&A
  - Acquisitions and Divestitures

Deepwater

- Exploration
- Development/Offshore Project
- Offshore Production

Emerging Country Development

- Traditional
  - Nigeria
  - Algeria
- Expanding NOC’s
  - Norway
  - China
- Self Sufficient
  - Saudi Arabia

Unconventional Resources

- Resource Development
  - Heavy Oil
  - Coal
  - Shale
  - Stranded Gas
- Renewables
  - Solar
  - Wind
  - Biomass
- Integrated Chains
  - Integrated Refineries
  - Storage, Transport, Processing, etc
  - LNG

CEO

Portfolio Strategy

Established Market Retail

- Retail in OECD, other established markets
...in which design follows function – focusing on differential sources of value...

### Distinctive Postmodern Sources of Value

<table>
<thead>
<tr>
<th>Category</th>
<th>Sources of Value</th>
</tr>
</thead>
</table>
| **Traditional Mature**          | • Cost control  
                                  • Supply chain management  
                                  • Acquisition and consolidation                                                   |
| **Deep Water**                  | • Exploration success  
                                  • Production platform project management  
                                  • Infrastructure leverage                                                            |
| **Emerging Country Development**| • NOC and government relations  
                                  • Innovative deal making  
                                  • National content development                                                      |
| **Unconventional Resources**    | • Extraction and Process Technologies  
                                  • Project management  
                                  • Integrated hydrocarbon supply chain development                                        |
| **Supply & Trading Value Capture** | • Risk management  
                                  • Creative product development  
                                  • Information systems                                                                 |
| **Portfolio Strategy**          | • Clear view of business context  
                                  • Business/Project risk assessment  
                                  • Portfolio modeling                                                                   |
... including nodes of functional excellence networks where they are most needed

Tailored Functional Excellence

CEO

Exploration

I.T.

Technology

Supply Chain

Human Resource

Unconventional Resources

Supply And Trading Value Capture

Traditional Mature

Deepwater

Emerging Country Development

Business Lines

Network

Functional Stewards

Functional Networks
Rethinking what a refinery should look like.

The Postmodern Refinery Extends its Product Markets into Chemicals and Power

- **Ethylene Cracker Complex**
  - C2-C5+
  - Natural Gas
  - Bitumen/Heavy Crude
  - Coke

- **FCC Coking Refinery**
  - C2-C5+
  - C1

- **Gasification Complex**
  - Syngas

- **Aromatics Complex**
  - BTX
  - Naphtha
  - Intermesates

- **Hydro-treating/Cracking Complex**
  - H2
  - Raffinate

- **Fischer Tropsch**
  - H2
  - Wax

- **Power**
  - CO2
  - EOR/Sequestration

- **Ethylene/Propylene**
  - Aromatics
  - Gasoline
  - Diesel
  - Lubes

Source: CRA International
Addressing the Capability Shortfall…

The Business Challenge

- “Filling the funnel” with opportunities
- Getting the deals done and satisfying host country needs
- Financing huge projects in a Sarbanes Oxley world
- Managing external risks (FCPA, HSE/GHG, social responsibility)
- Executing the projects on time, on budget
- Creating effective joint venture organizations
- Building integrated supply chains

The ROCE Legacy

- Only a few capable IOCs left
- Downsized organizations
- Aging work force
- Unfavorable industry reputation
- Weakened oilfield service sector
- Underinvestment in technology
- Shortage of special steels and other key materials

Not Enough Projects to Meet Demand
... retaining the greying experience base while adding a new, diverse work force

**Capability Retention And Transfer**


**Capability Challenges**

- Experienced employees enriched by high stock values heading for the golf course?
- “Best of the Best” new recruits only available in developing countries
  - China graduating 500,000 engineers per year = 10x US total
  - National content targets oblige companies to nurture local talent
- Flat organizations and performance models predicated on experienced staff
Measuring and communicating post-modern progress beyond traditional near-term metrics

**Terra Firma**
- Synergy capture
- Costs
- ROCE
- Capital discipline
- Reserve replacement

**Terra Nova**
- Mid-to-long term Earnings Growth expectations
- Strategic positioning vs. mega-trends
- Portfolio optimization
- Building new growth platforms to scale
- Technology leadership
- Human capital > physical capital – growth incentives
- Higher returns **earned** by adding value (customers, services, technology, processes, global scale)

**Terra Incognita**
- Defined R&D Platforms
- Number of new products, and number in late stage trials
- Clear pipeline milestones with cycle time
- Value transparency established (via collaborations) at each stage of pipeline
- Year-over-year pipeline “strength” comparisons
- Revenues from new strategic alliances