Can the E&C Industry Meet the Growing Demands?

Keynote Address

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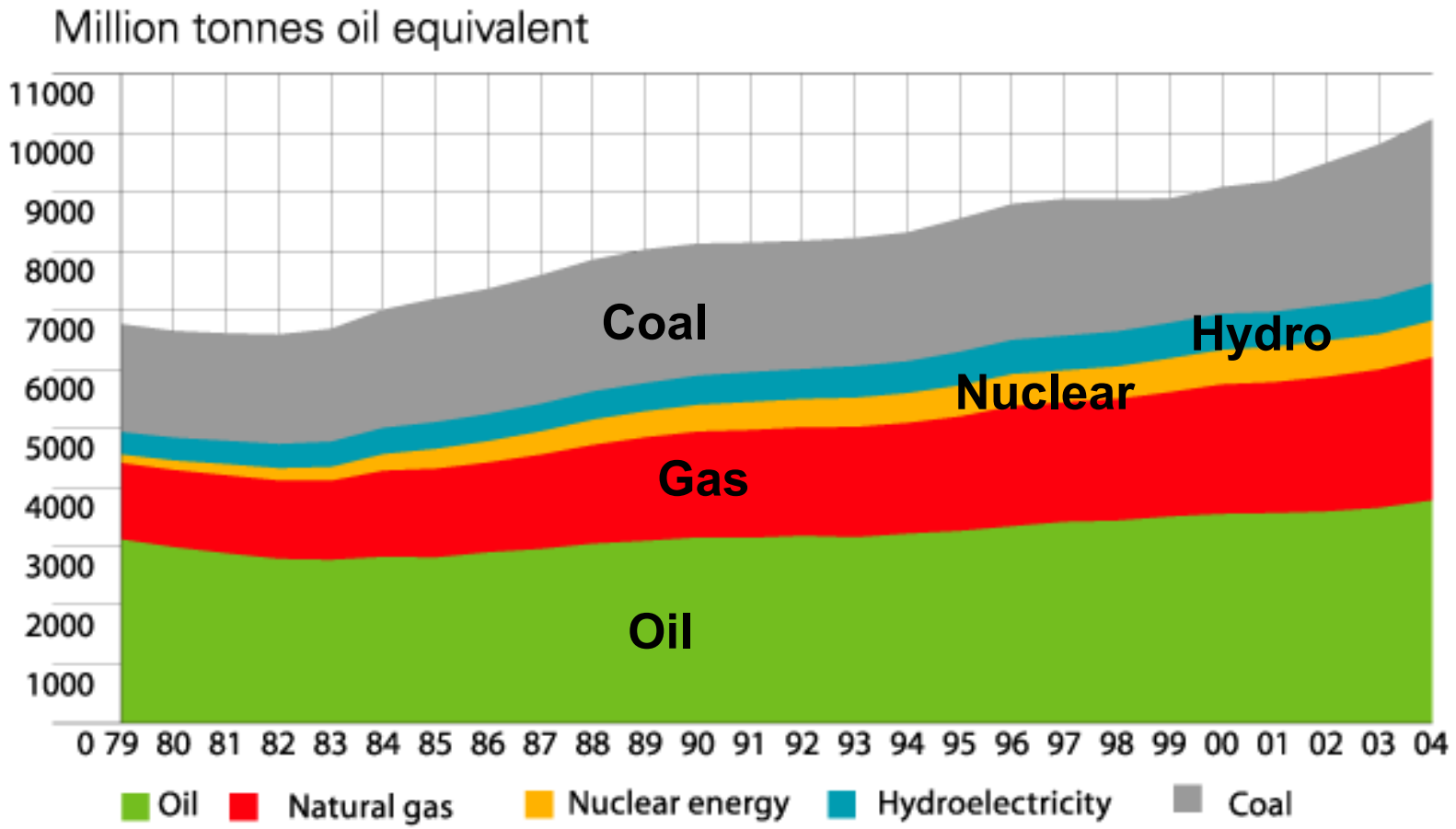
Bechtel Oil, Gas & Chemicals

Outline

- Demand for E&C Services
  - Growing Energy Demand
  - The Increasing E&C Workload
- The State of E&C Industry Resources
  - People
  - Globalization
- The Global Procurement Picture
- How are Energy Clients Adjusting
  - Innovative Contract Strategies
  - Risk Sharing

World Primary Energy Consumption



Global primary energy consumption recorded the strongest incremental growth ever, rising by 4.3%. Growth was above the 10-year average in all regions and for all fuels.

BP Energy Survey 2004

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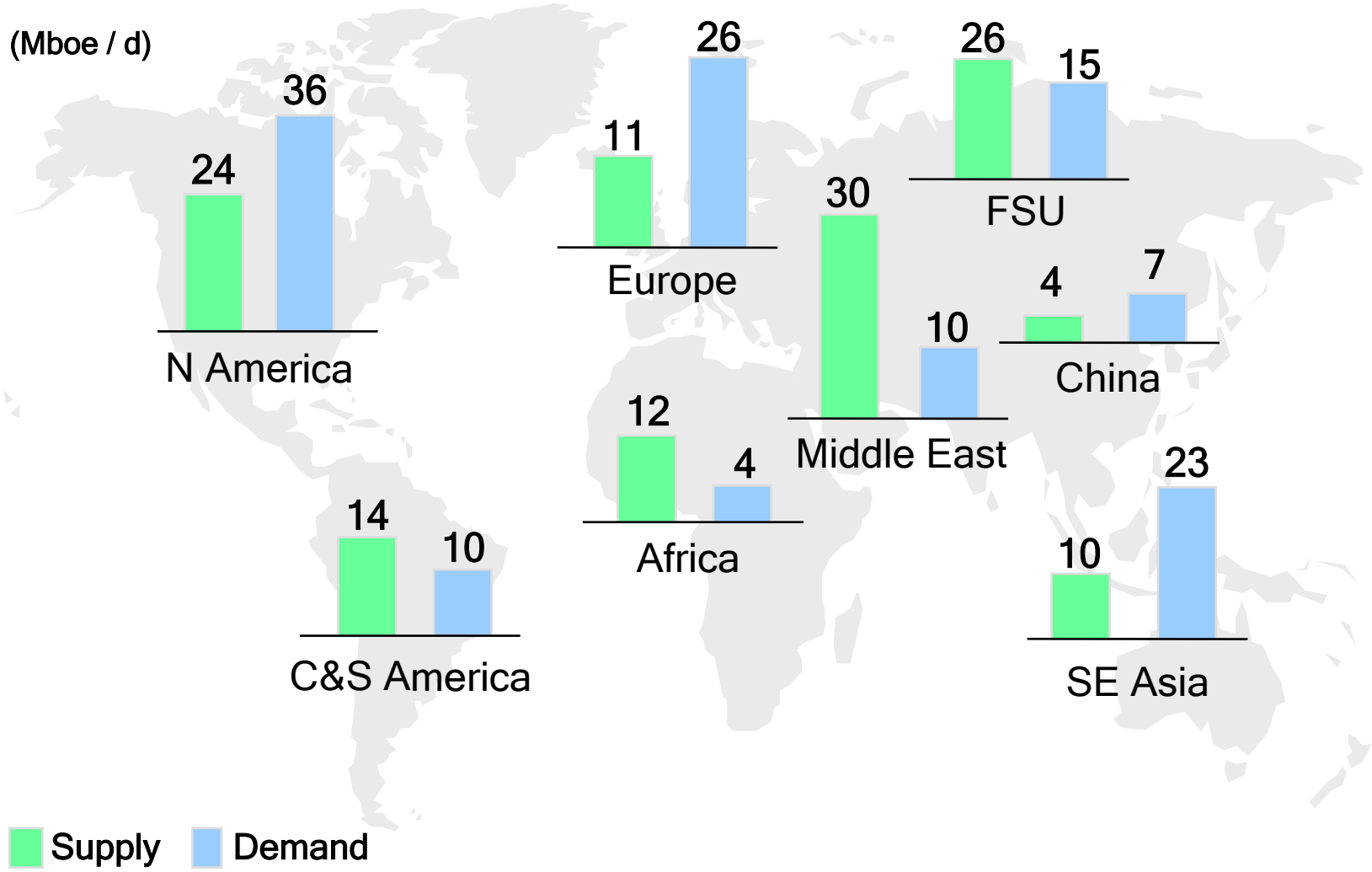
Oil & Gas Supply and Demand Imbalance



Source: BP Energy Survey 2004

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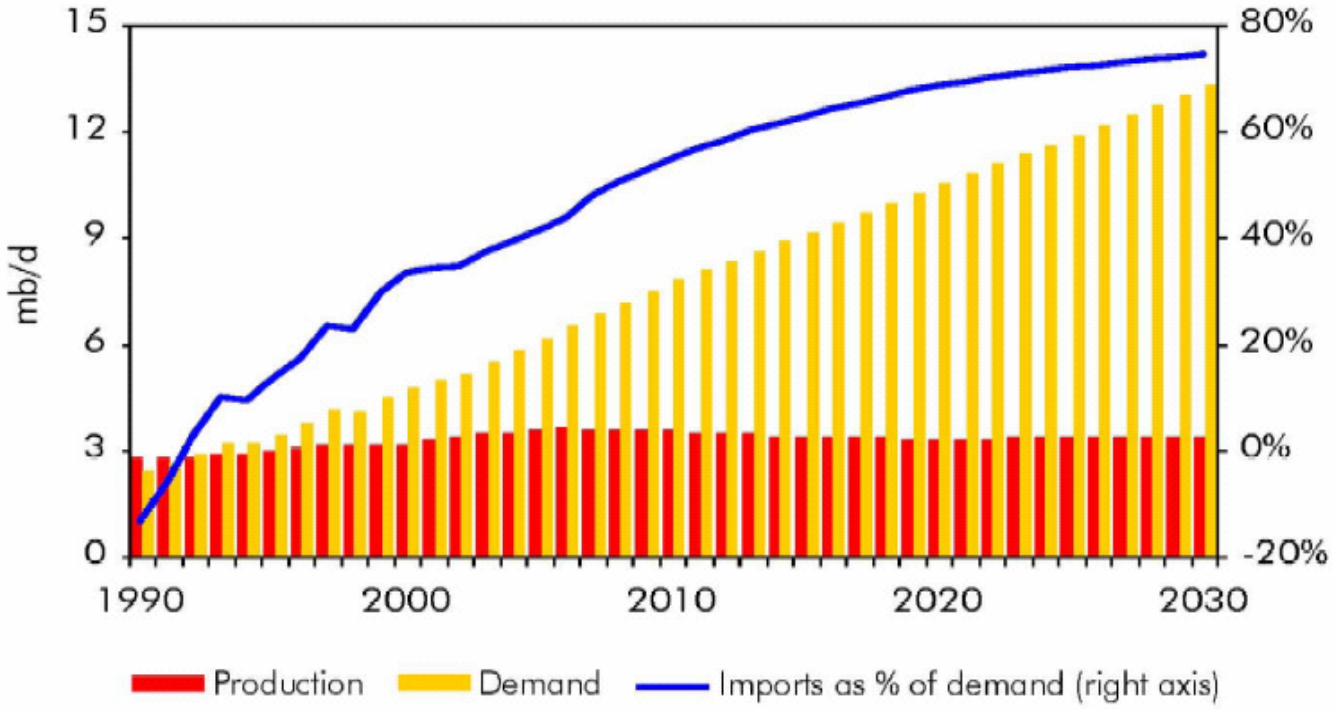
China's Oil Imports Rising



China's oil imports will soar from 2 mb/d today to almost 10 mb/d in 2030, about 75% of demand

Source: HEA WEO 2004

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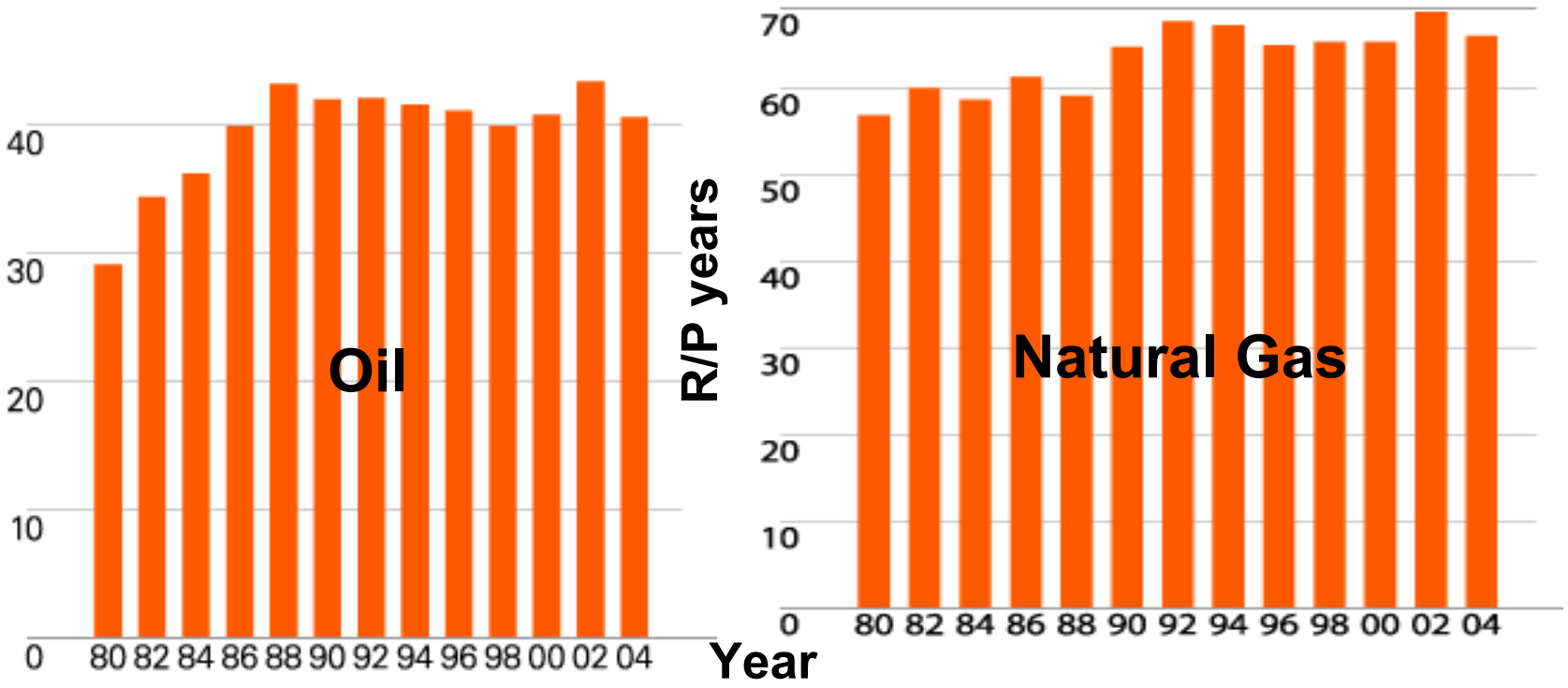
Reserves/Production Ratios are Steady

R/P steady despite increasing demand as technology enables new production



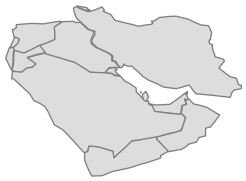
BP Energy Survey 2004

Crude Oil Supply/Demand

- Margin today is only 1 m bbl/d, causing price spikes
- Reasons:
  - Low investment in the 1990s
  - Booming demand growth
  - Geopolitical tensions and speculations

- Supply to increase by 16 million bbl/d by 2010 while demand up by 9 million bbl/d (CERA, June 2005
- High refinery utilization in U.S.
- High potential for disruptions remain

Where is the Oil and Gas Industry Investing?
Key Examples



Middle East
- Oil production − Saudi Arabia, UAE, and Kuwait
- Gas processing − UAE and Saudi Arabia
- LNG production − Qatar
- Downstream refining and petrochemical − Saudi Arabia, Kuwait, UAE, and Qatar

Russia and the Caspian
- Oil production − Caspian Sea/Siberia
- Gas production − Siberia

North America
- Clean fuels − U.S. and Canada
- Oil sands − Canada
- Refinery expansion − U.S.

Africa
- LNG production − North and West Coast
- Offshore oil production − West Coast

Asia
- Petroleum and Chemical − India and China
- LNG – Indonesia and Australia

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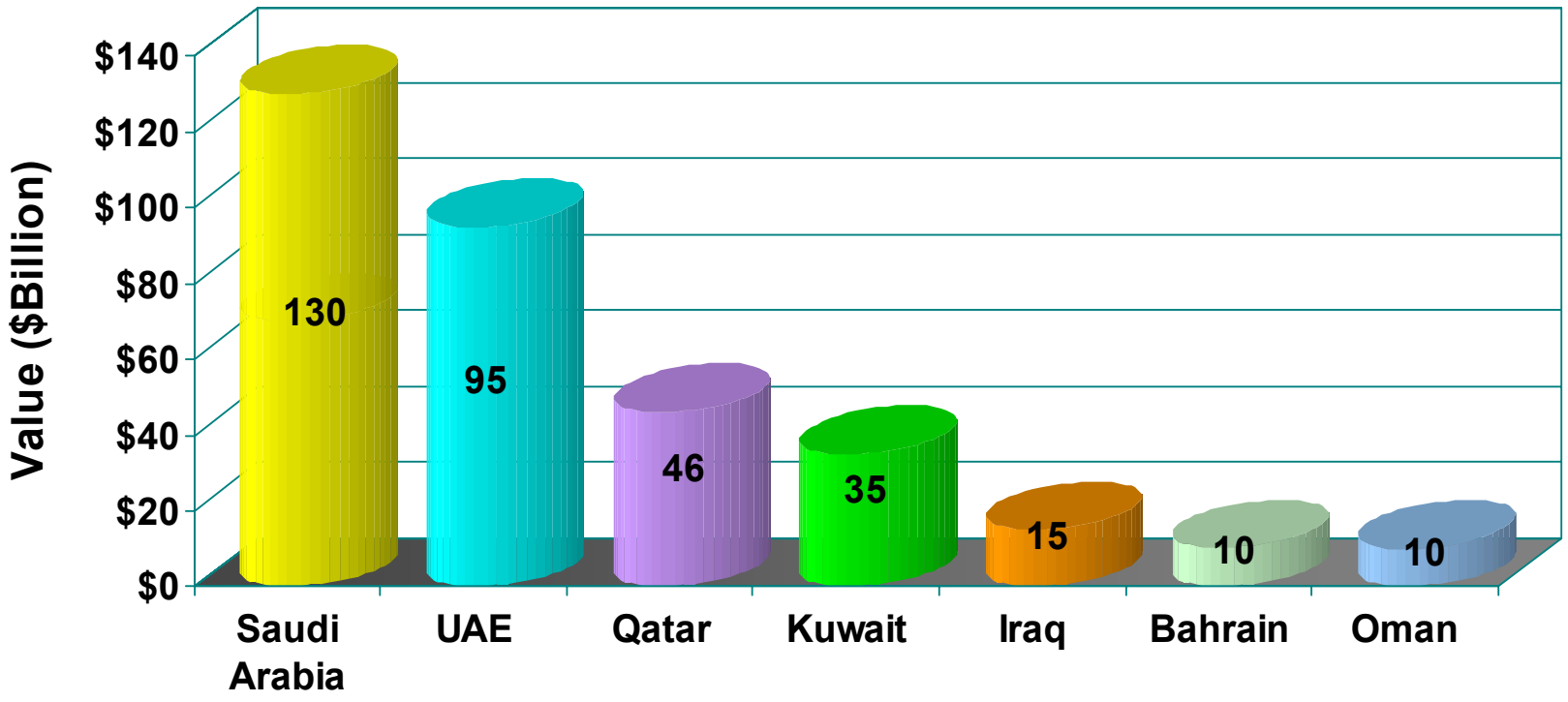
Middle East CAPEX

Capital Expenditure 2005 – 2010 in the Gulf Region over $340 Billion

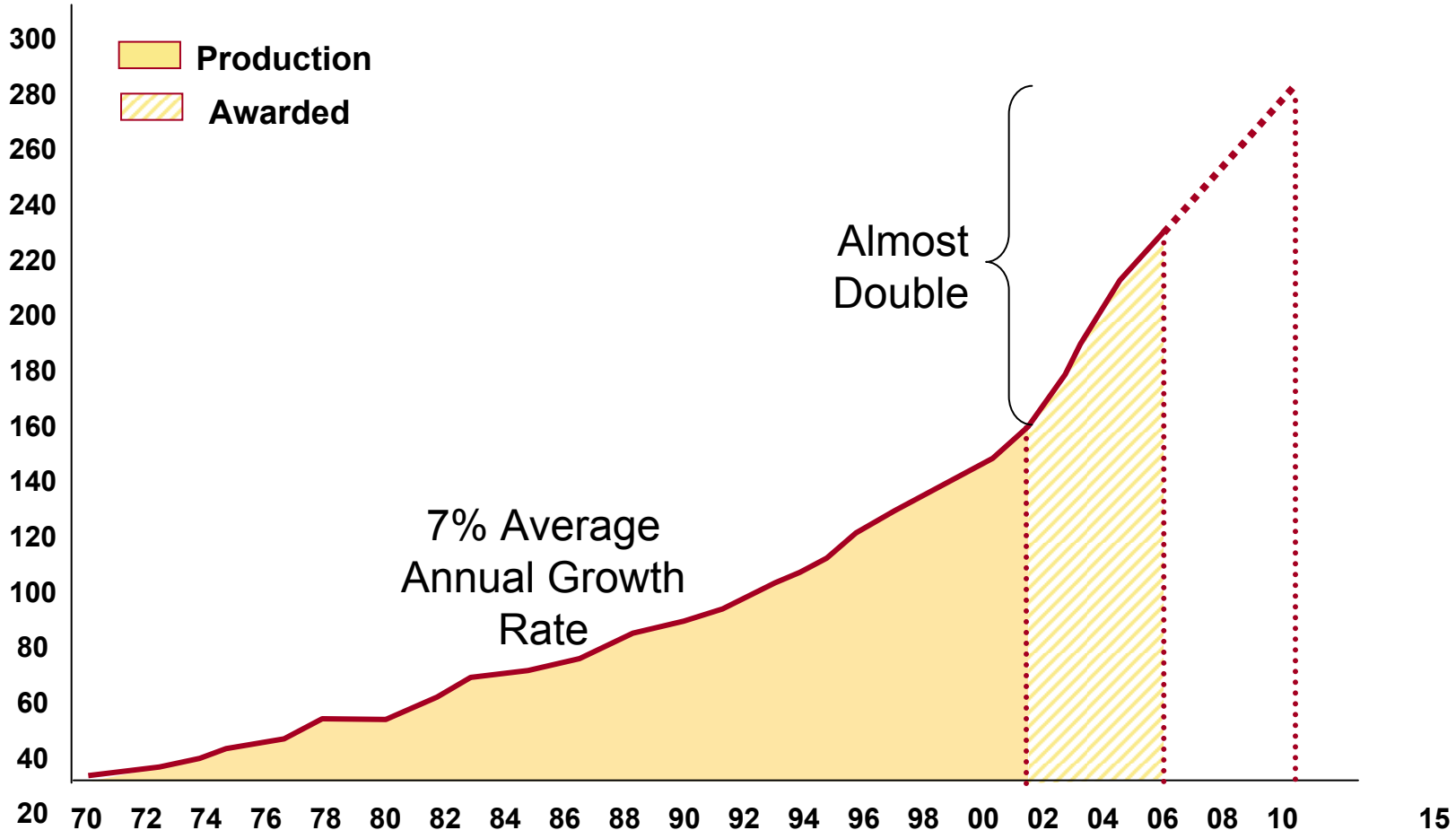
(Projects greater than $200 million)



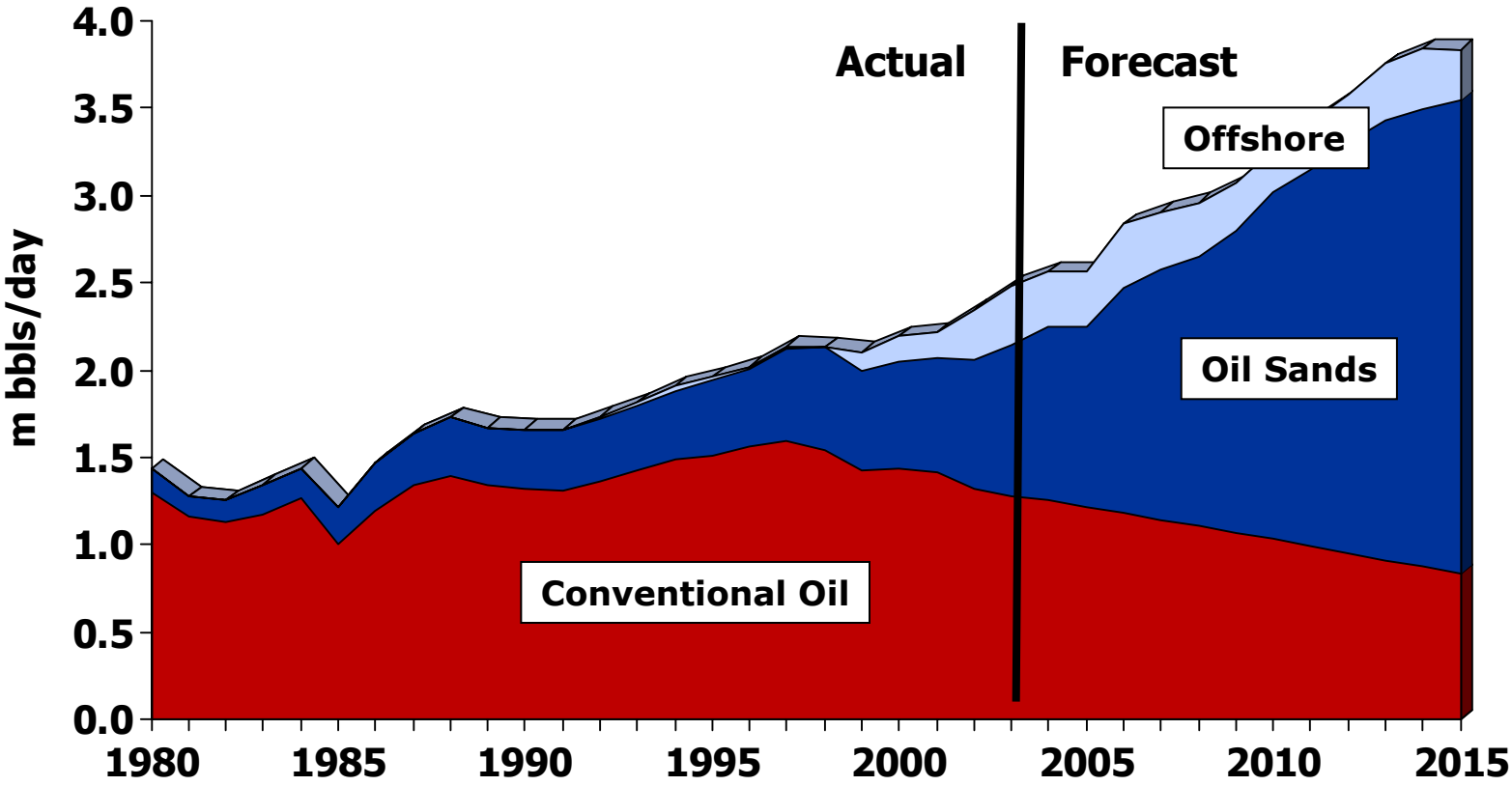
Significant Pressure on EPC

Source: Saudi Aramco May 2005

Global LNG Production



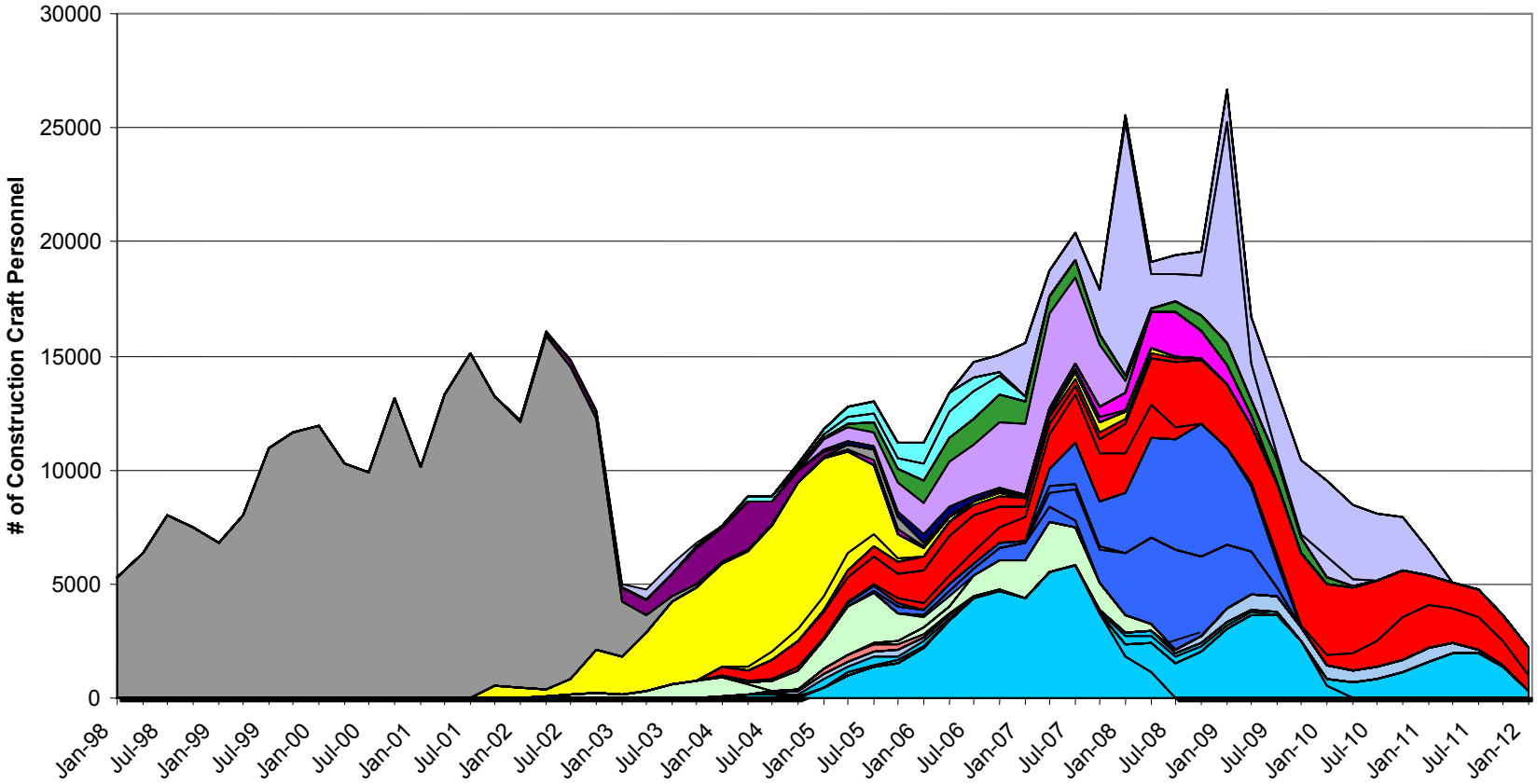
Canadian Oil Production



Source: CAPP presentation at IPAA Mid year meeting, June 2005 SF

Canadian Workload

Alberta Industrial Construction Projects >100 MM Cdn
1998 – 2012



Source: Construction Owners Association of Alberta (COAA) 2004

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Changing Times in the E&C Industry

E&C demand now exceeds the industry's capacity . . .

- People constraints
- Higher material costs and longer delivery time
- Higher construction costs and shortage of labor and equipment

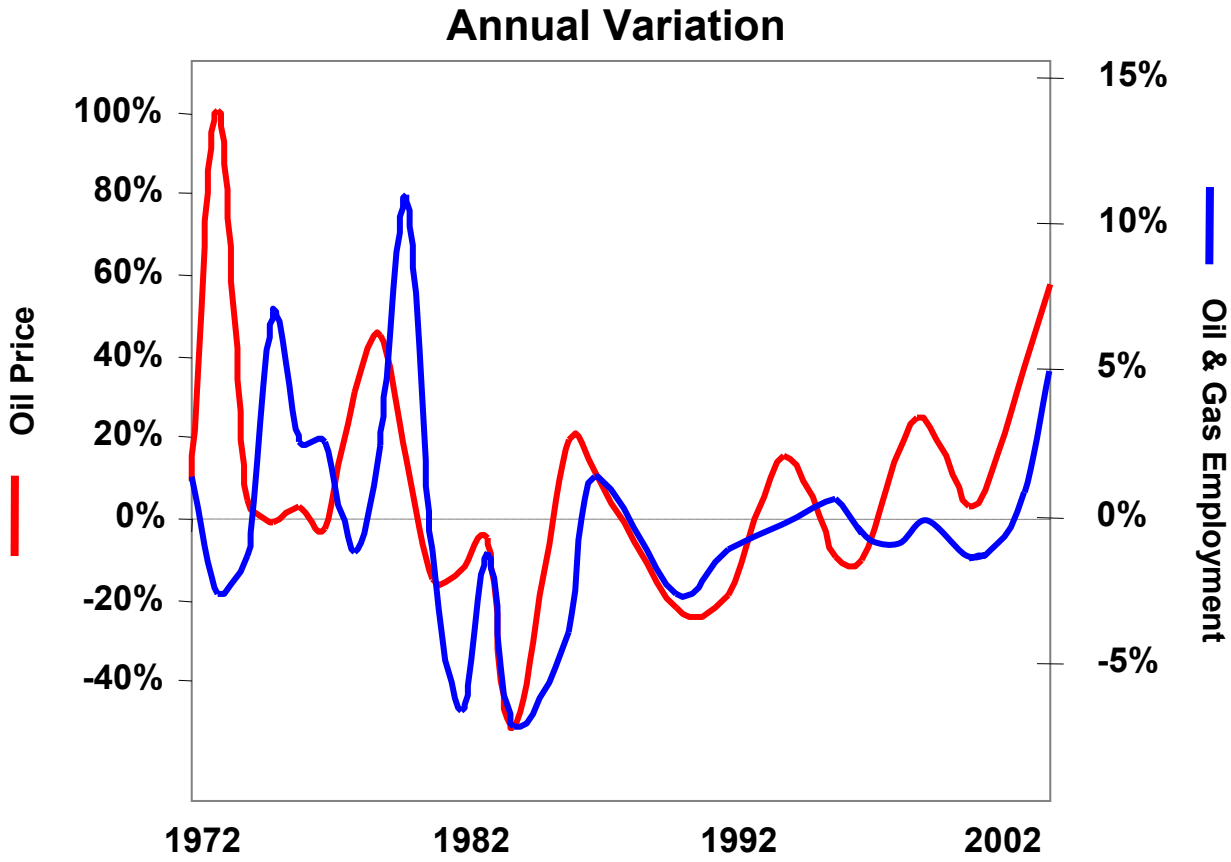
Scouting for resources . . . a big challenge for owners and contractors

People

- People are the key resource in the E&C industry
- It is about leadership teams
- It is about people's competency
- As market complexity grows . . . need the right people to develop solutions

Oil and Gas Industry Employment

- Employment largely followed oil price trend cycle



Source: U.S. Bureau of Labor Statistics

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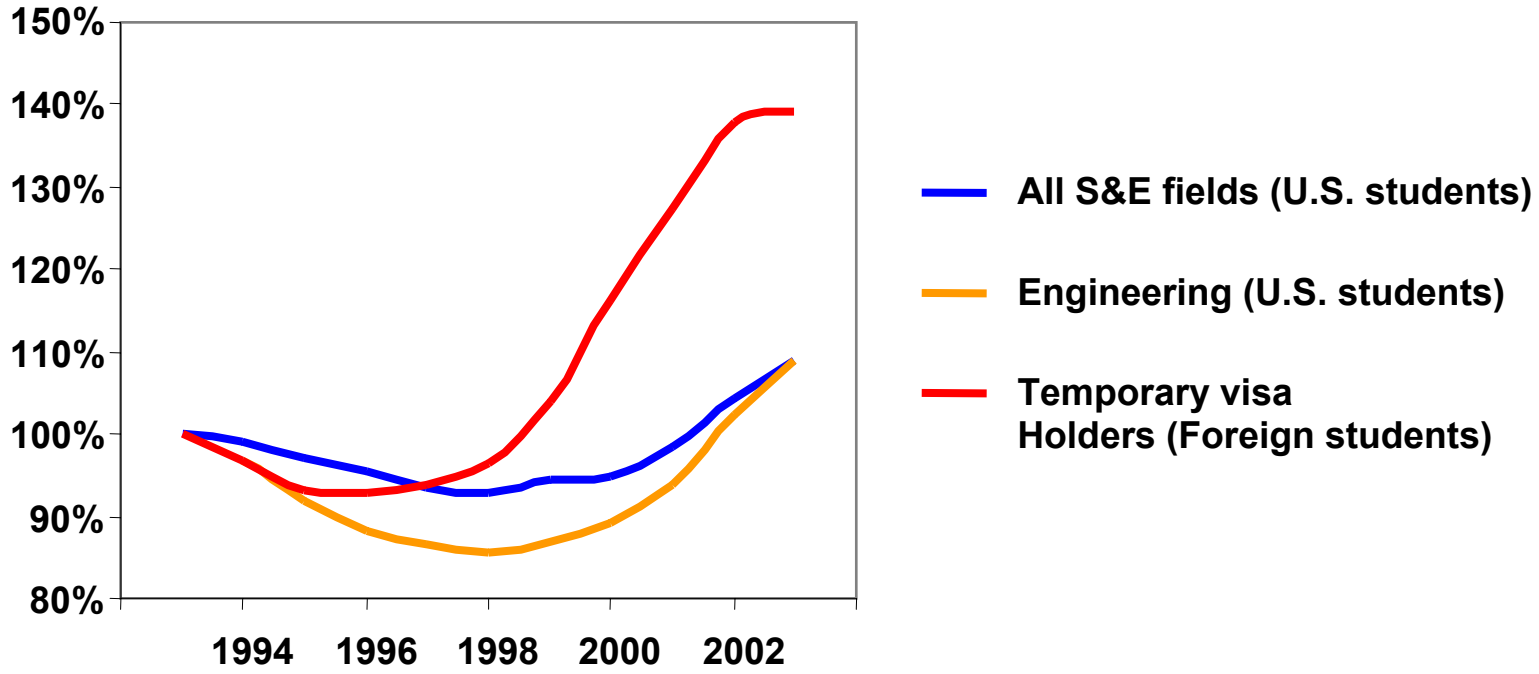
Engineering Graduate Situation

- Enrollment in Science and Engineering (S&E) programs in U.S. has come back to 1993 figures in 2002 after a 8-year downturn
- Foreign students largely compensated for lack of U.S. students

Graduate Enrollment (normalized at 1993)



Source: U.S. Science Resources Statistics

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People Issues Facing the E&C Industry

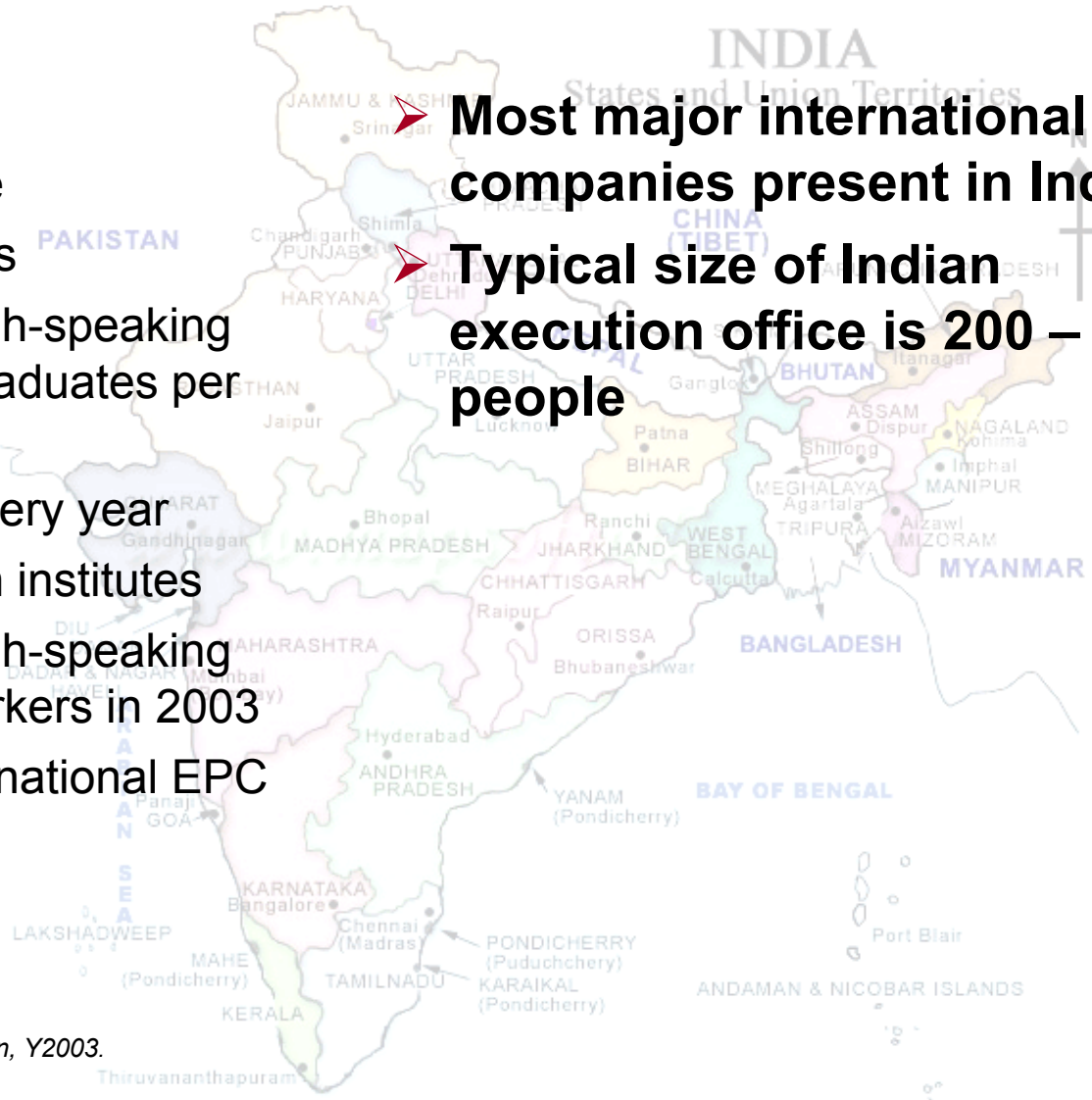
- Tremendous growth required
- Aging workforce demographics
- Developing and retaining existing talent is critical
- Recruitment will result in unsettled workforce
- Salaries and benefits will rise while productivity drops
- Training will become critical

Multiple Office Project Execution

- Traditional U.S./U.K. engineering workforce cannot meet the demands
- Young, motivated, and educated workforces of developing countries must be utilized
- Leveraging India, Philippines, Poland, Malaysia, China, and other high value engineering centers required
- Successful multiple office execution requires:
  - Automation and standardization tools
  - High speed communication
- Talented and mobile leadership teams

Leveraging India

- **India**
  - 1 billion people
  - 380 universities
  - 200,000 English-speaking engineering graduates per year
  - 9,000 PhDs every year
  - 1,500 research institutes
  - 650,000 English-speaking knowledge workers in 2003
  - Growing multi-national EPC operations



- **Most major international E&C companies present in India**
- **Typical size of Indian execution office is 200 – 1,000 people**

Source: Government of India publication, Y2003.

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Market Uncertainty – Procurement Challenges

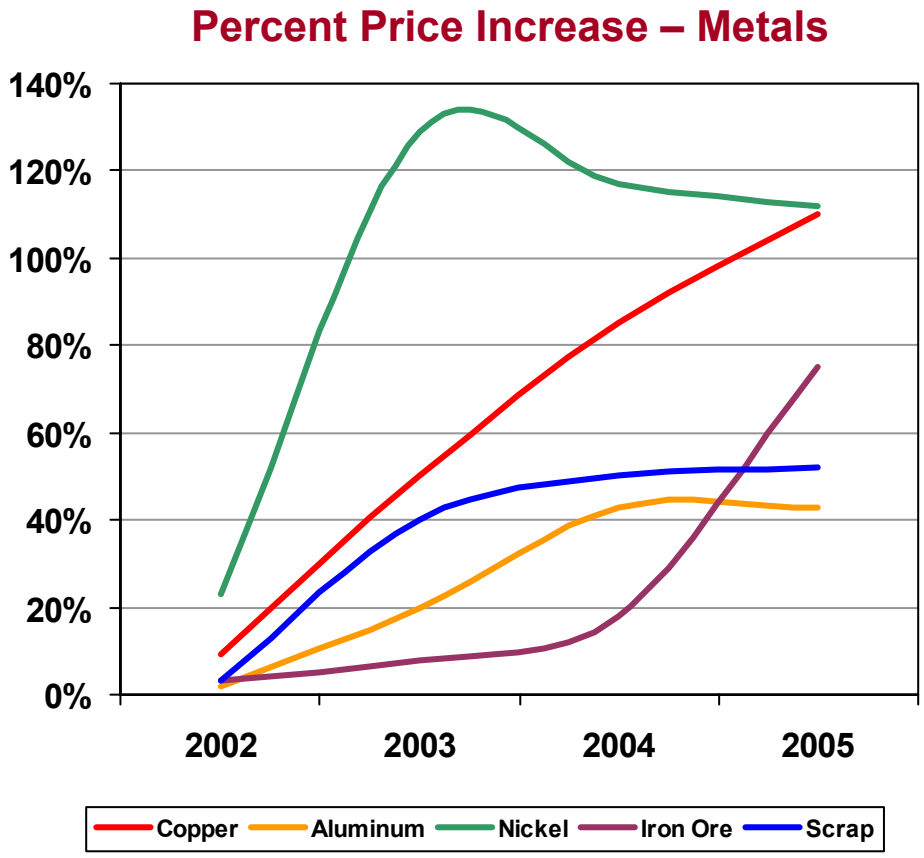
- Extremely volatile commodity, material and equipment prices
- Extending lead times
- Higher shop loads

Reasons:

- Sustained raw material supply and demand imbalance
- Constraints throughout the supply chain
- Required capacity not being added

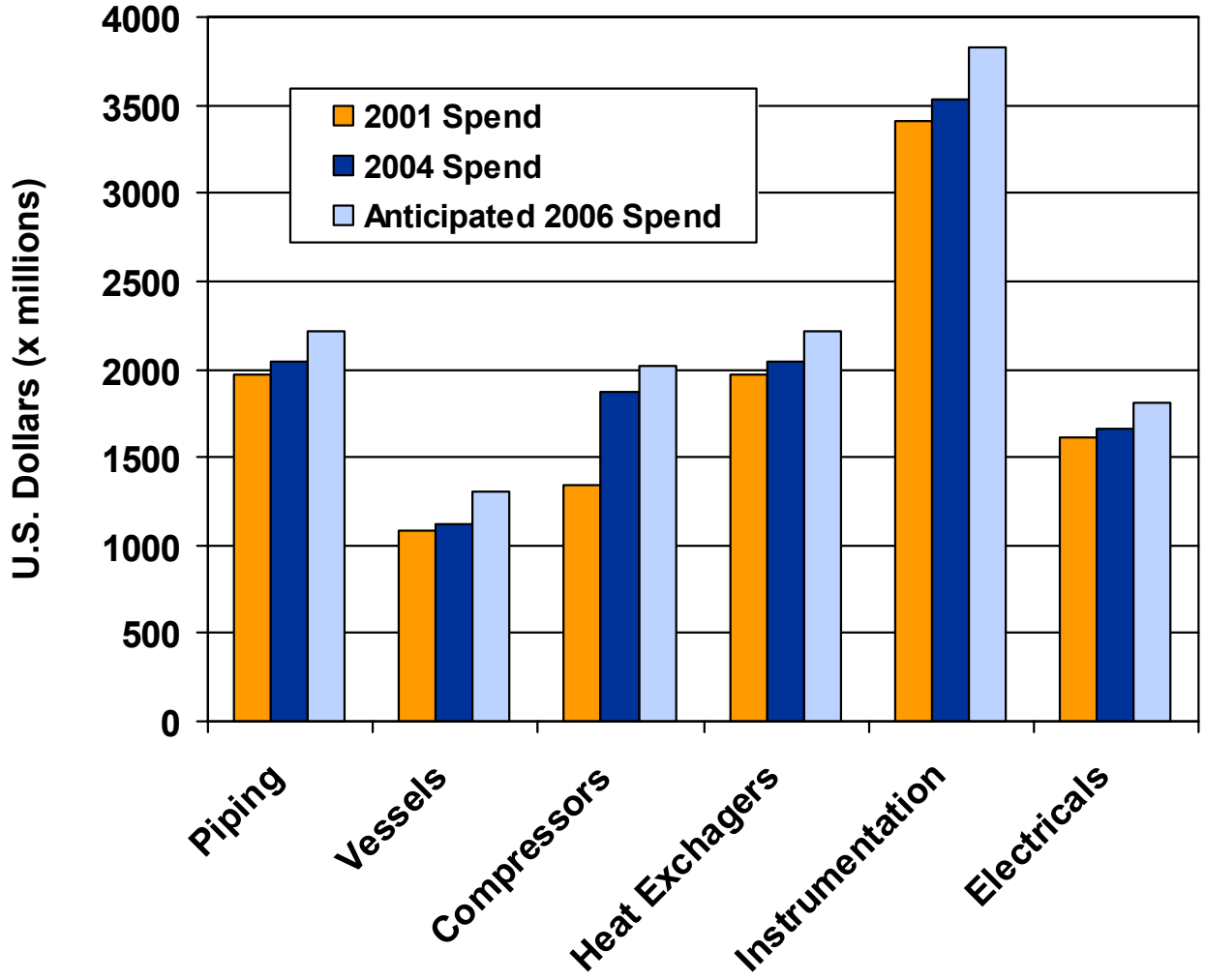
Commodity Price Trends

- Commodity prices are up
- Factors:
  - China
  - Production disruptions
  - Labor shortages
  - Shipping



Source: Metal Prices.com

HPI Projected Key Spend Items

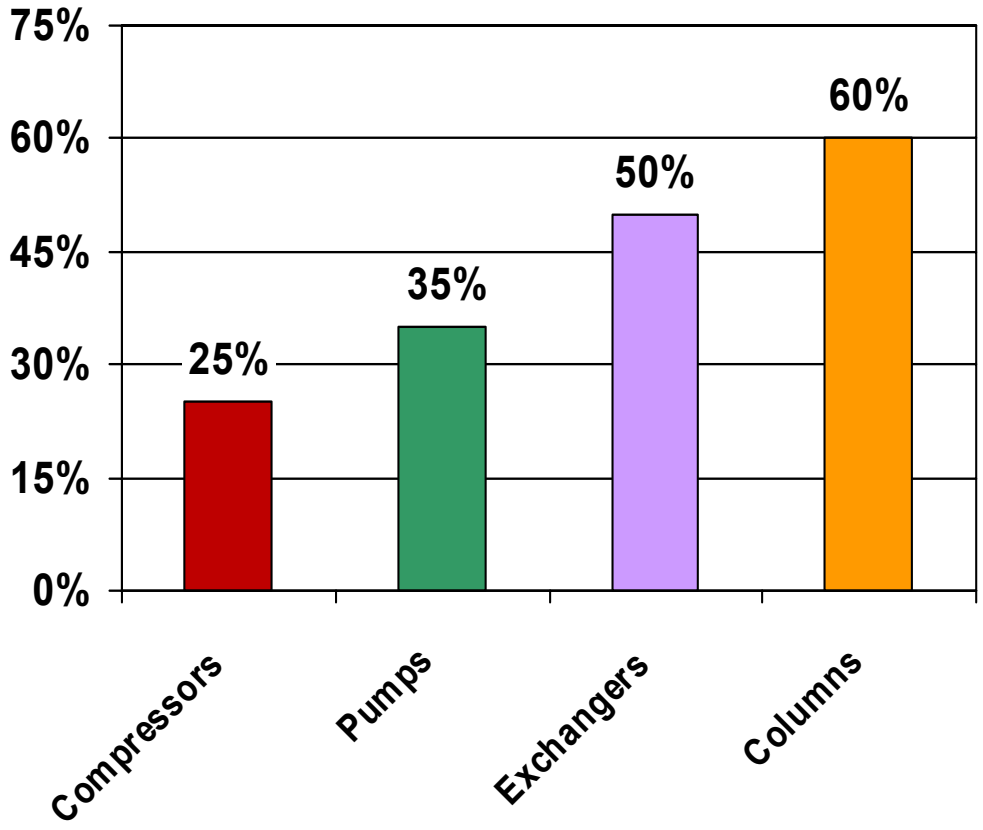


Source: Hydrocarbon Processing Industry

Global Procurement − Challenges

Major Process Equipment Price Growth

- Price increases from 2003 to present
- Suppliers hedging their bet with inflated contingencies
- Prices do not have long validity periods and subject to “Prior Sale”
- Major increase factor shifting from raw material availability to shop load



Source: Project Management Institute

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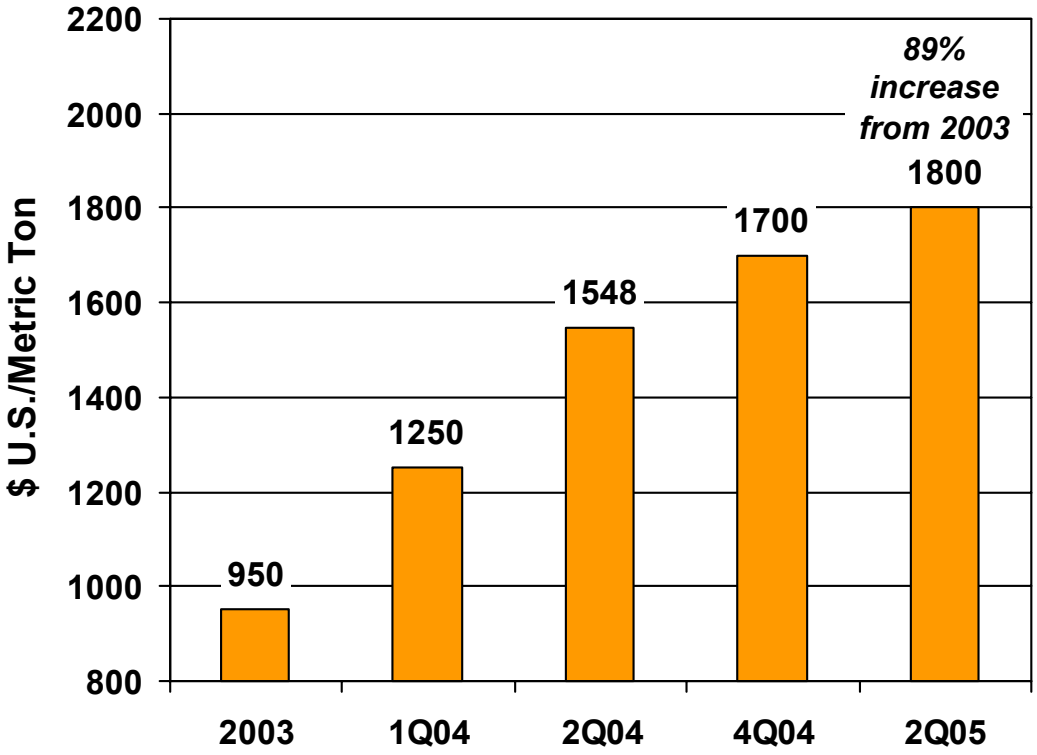
Global Procurement − Challenges

Seamless Pipe Cost

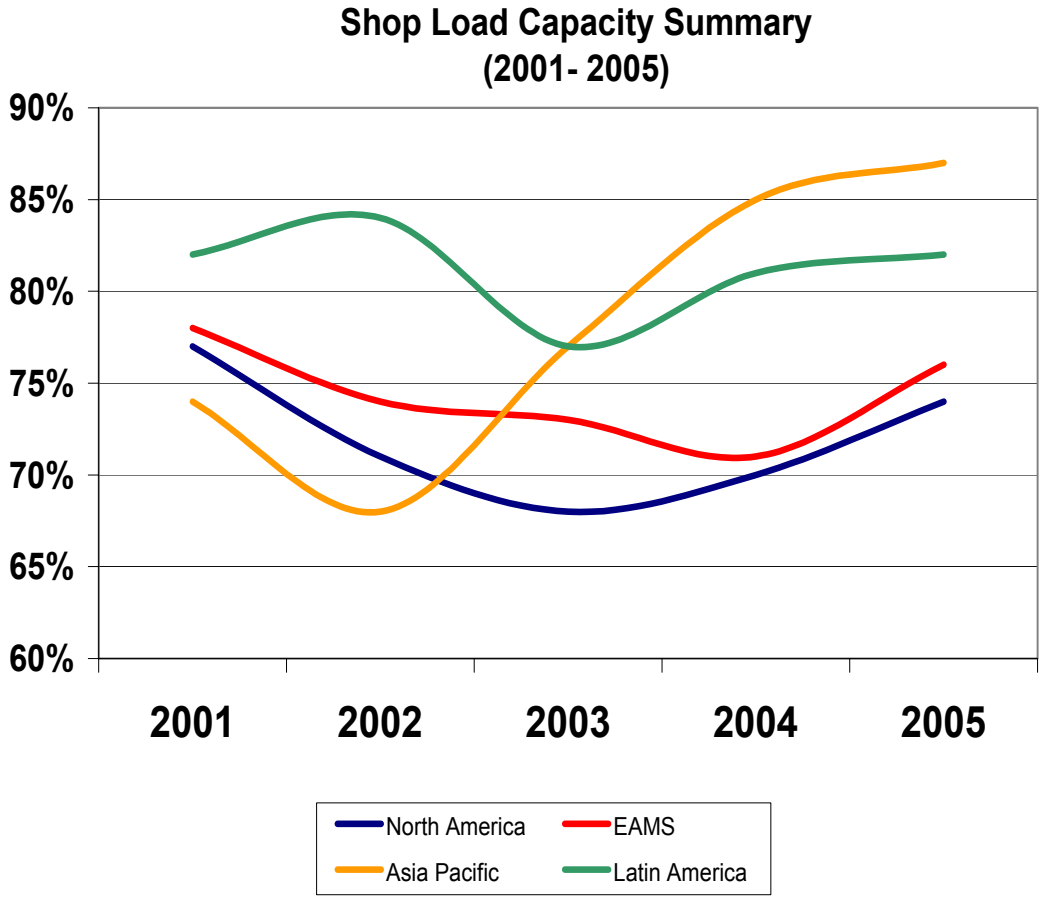
- Heavy exploration driven prices higher
- Large bore mills fully booked through 2006
- Tight supply through 2007
- Quotes received recently that reflect up to 40% increase from last year



Source: Project Management Institute

Shop Loads – Global Regions

- On the rise in the last two years
- Includes all goods from standard stock products to special fabricated equipment
- Includes all industries



Source: Global Supply Trends

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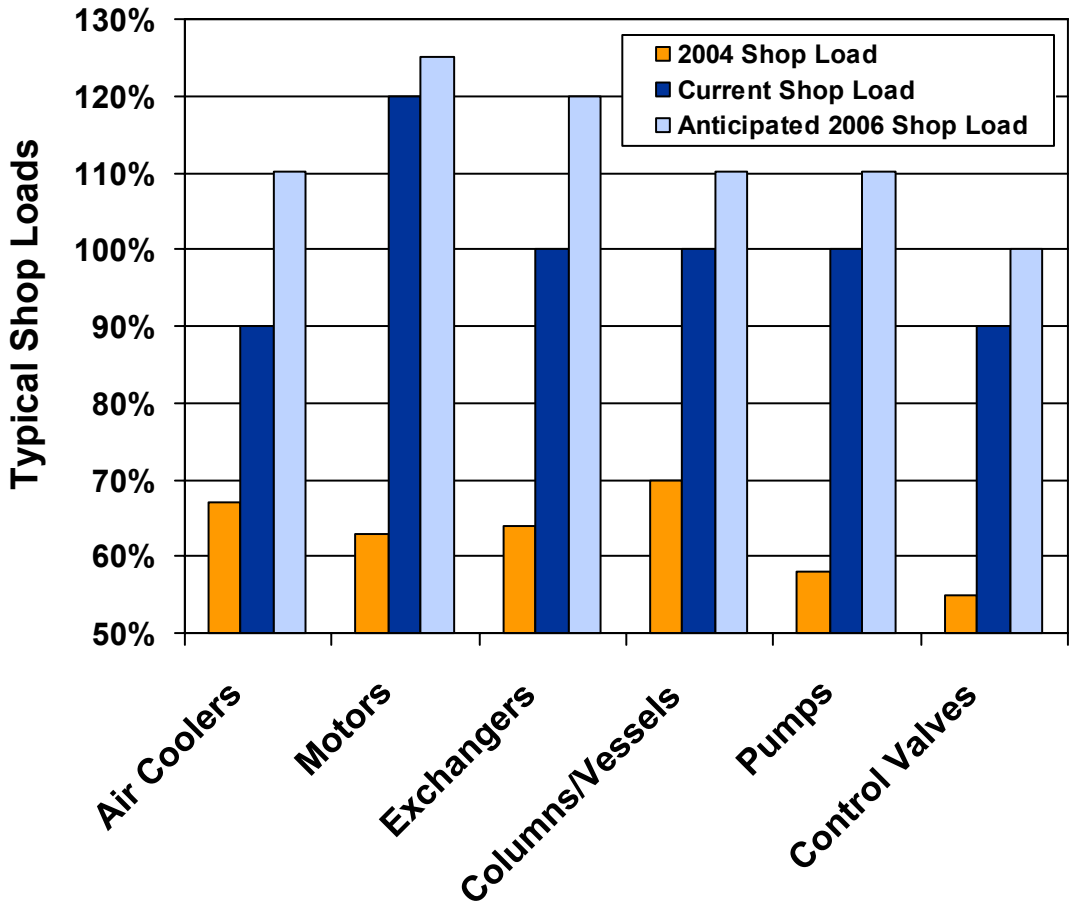
Process Equipment Manufacturing Capacity Utilization

> 80% = Supplier Resource Stretch

- Shop schedules difficult to recover from problems
- Product quality and customer service declining from lack of resources
- Down payment required to lock shop space early
- Manufacturing productivity fall off



Source: Global Supply Trends

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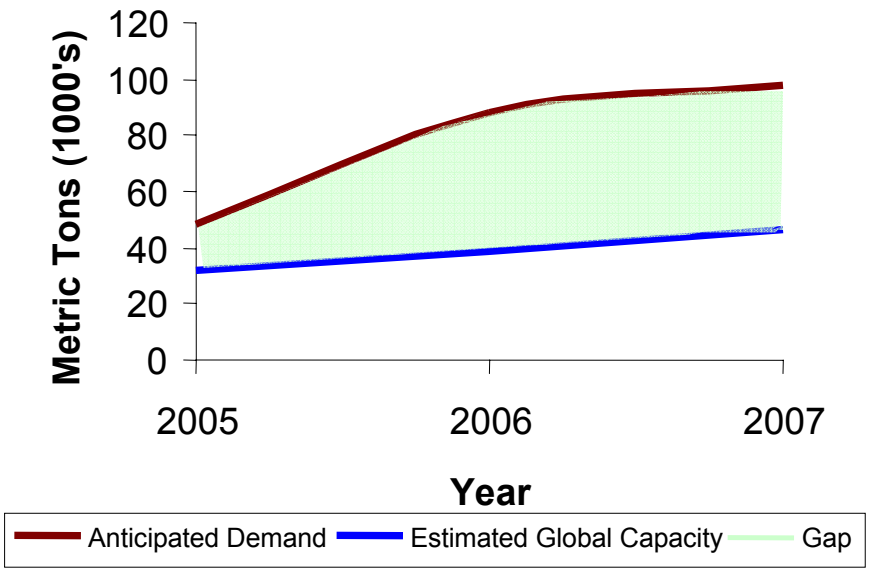
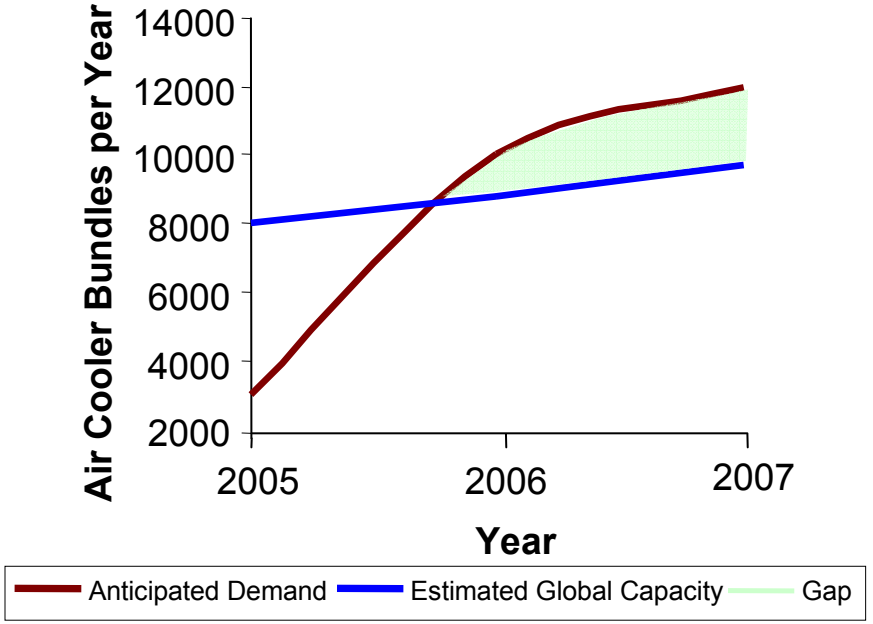
Equipment Supply and Demand Imbalance

Heavy Wall Reactors > 7" Global Supply vs. Demand



Global Supply vs. Demand Air Cooled Heat Exchanger Bundles



- Air cooler demand 1.5:1 in 2007
- ROI uncertainty – no added capacity
- Few suppliers

Source: Global Supply Trends

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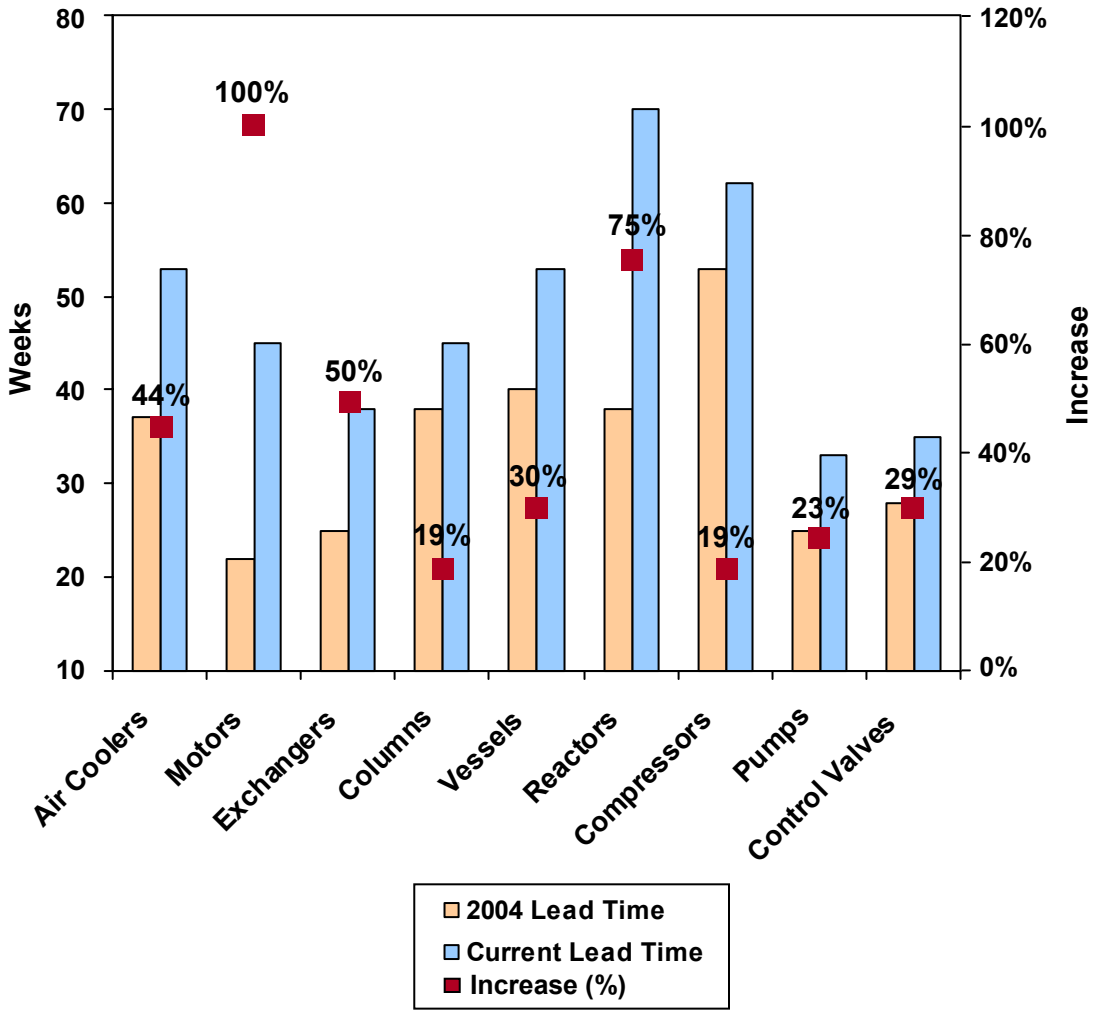
Lead Time Increases

- Lead times pushed out due to high demand
- Plate, forgings, and castings on the critical path
- Suppliers unwilling to make 2006 lead time commitments due to workload uncertainty



Source: Global Supply Trends

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The Landscape is Changing

Recent past . . .

- Low global workload led to:
  - E&C contractors in a fierce competitive environment driven by limited job availability
  - Many took risky projects at a low (or no) margin
  - Agreed to onerous contract terms

Hence:

- Project execution jeopardized by the excessive risk taken by the contractors – owners got no bargin
- Many projects experienced significant delays and cost overruns

The Landscape is Changing *(Cont'd)*

Today . . .

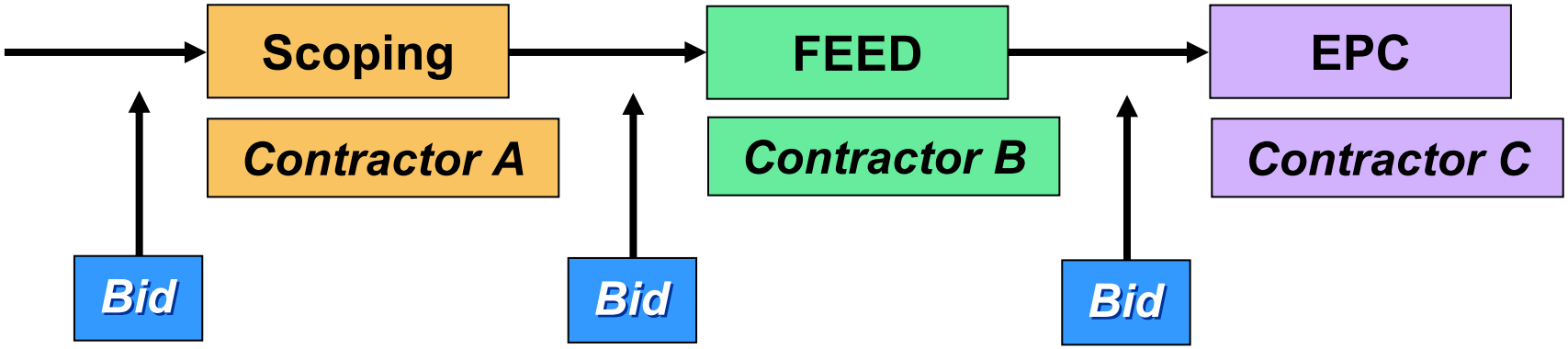
- Unprecedented global increases in demand for E&C resources
- Time is of the essence for today's energy projects . . . owners want to maximize return on investments
- Market can not afford the increasing uncertainty in E&C performance
- Out-of-the-box contracting schemes and other mitigation required

Contractual Approaches Being Utilized

- LSTK bids
- Cost reimbursable
- Cost reimbursable with bonus/penalty
- Bid cost reimbursable front-end with conversion to open book lump sum
- Negotiated awards

Project Execution Models

The Traditional LSTK Bid Approach

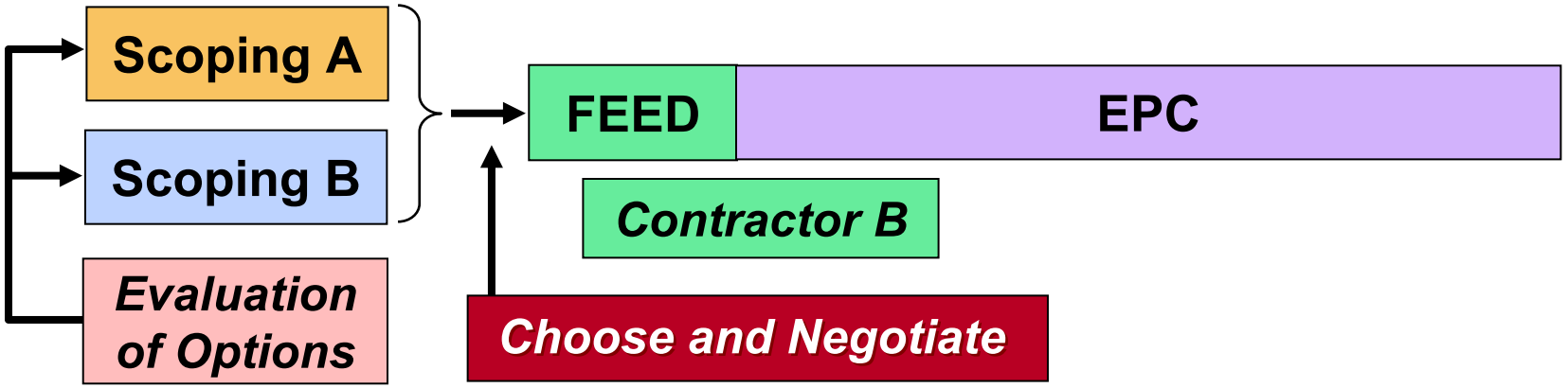


Features:

- Longest schedule − lowest NPV
- Limited number of contractors able and willing to bid
- Contractors forced to utilize team available at time of award

Contractual Models

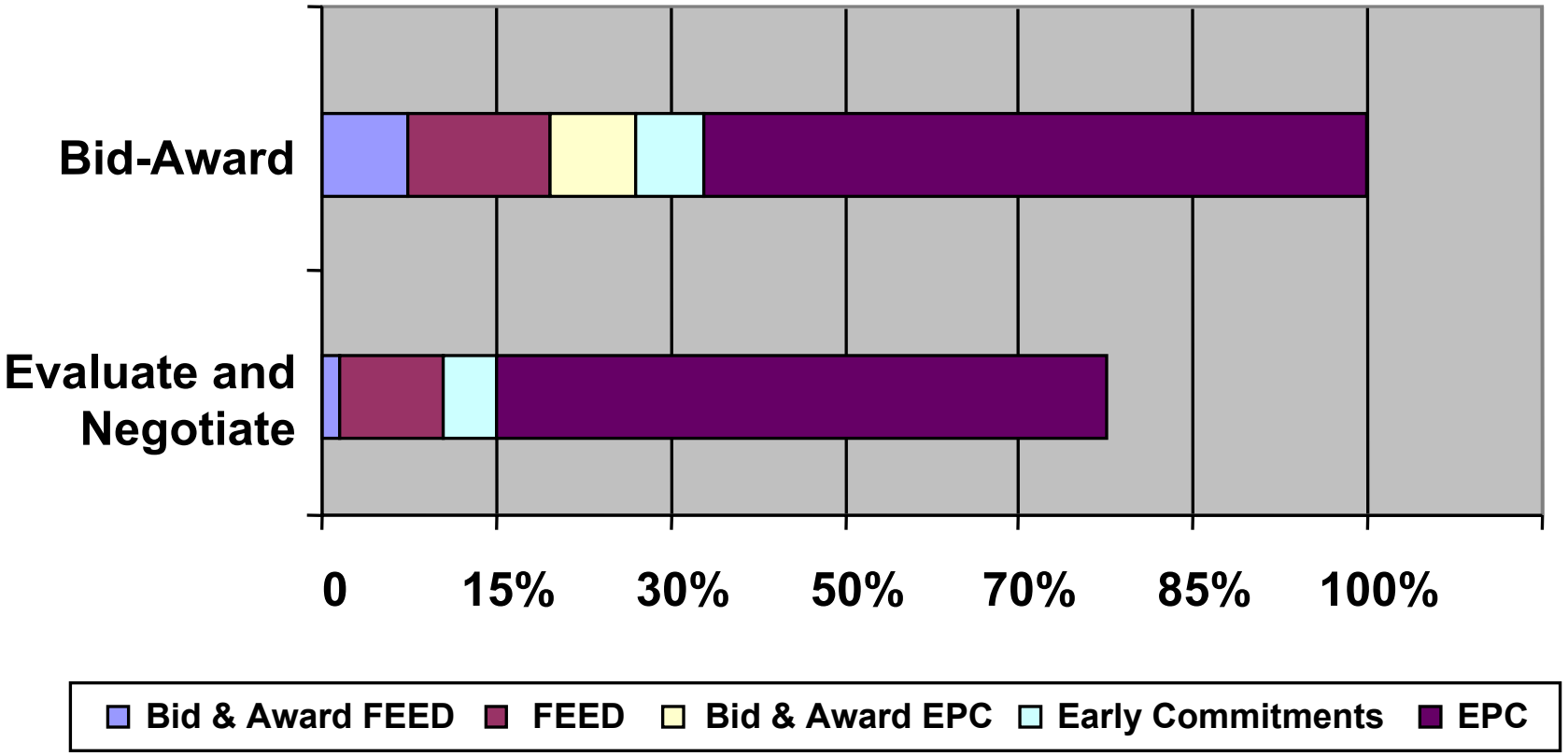
The Evaluated and Negotiated Approach



Features and benefits:

- Shorter schedule, highest NPV
- Open book FEED
- Competitive EPC cost
- Local acceptance (Egypt, Saudi Arabia, Nigeria, EG, others)
- Process can be transparent and ensure local content
- Contractors have time to organize strong execution team during FEED phase

LNG − Real Example



Clients See the Need to Adjust

Some recent major awards in the Middle East show a new reality:

- Traditional LSTK approach . . . turned to an evaluated and negotiated approach
- Early purchasing commitments to tie up limited market resources
- Time to market is an increasingly important driver
- Concern over locking in quality E/C resources

Summary

- Global demand for E&C growing rapidly
- The E&C industry needs to continue investing in people
  - Hire, train, and retain key people
  - More high-value engineering centers around the world
  - More standardization and automation
- Continued volatility in commodities, material, and equipment pricing and delivery schedules
- Some clients are starting to adapt:
  - Revamping contracting strategies to be more effective
  - Accelerating schedules to lock-in quality resources
  - More innovative risk sharing

Summary *(Cont'd)*

The future will be challenging:

- The next 5 years will be very difficult; E&C performance will likely suffer:
  - More projects will be awarded to less qualified contractor teams
  - More large, critical capital projects will miss the mark on costs and schedules
- Contractors with the best teams, tools, and processes capable of multi-office project execution will deliver best results
- Owners adopting contracting strategies to meet the market realities will see the best results