

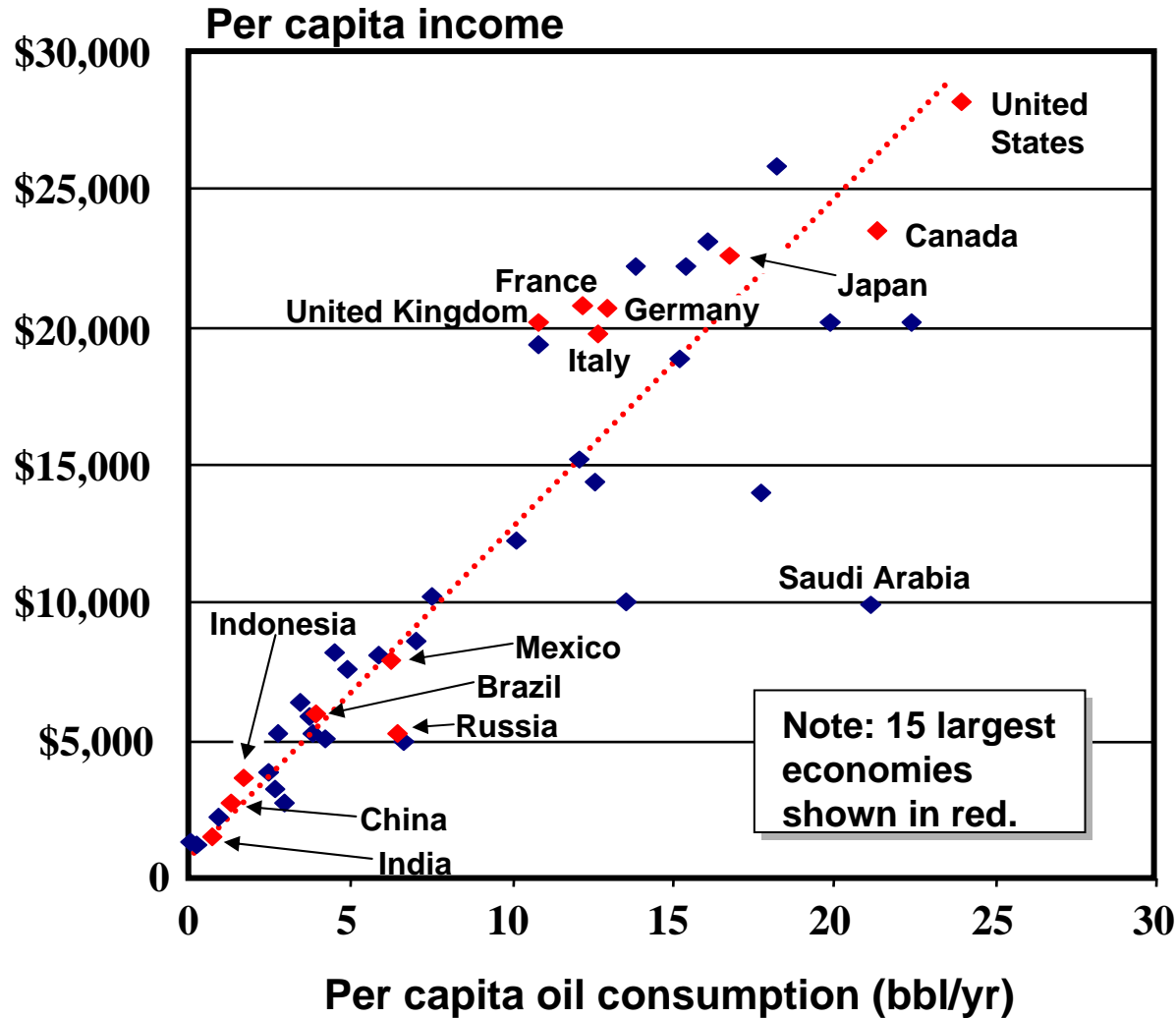
The Workforce Initiative  
Department of Petroleum and  
Geosystems Engineering

The University of Texas

Mukul M. Sharma  
Professor and Chairman



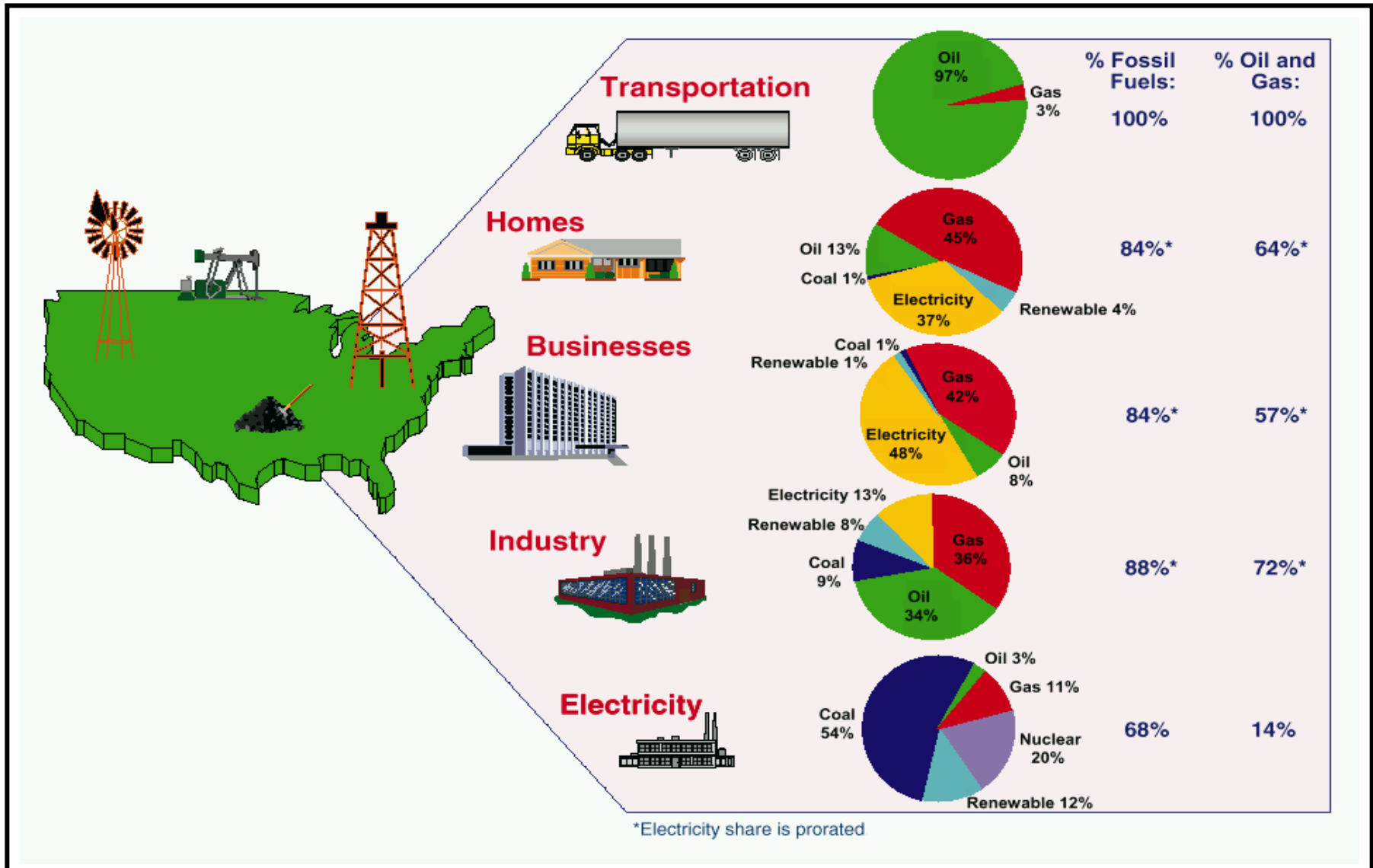
# Our Standard of Living Depends on Energy



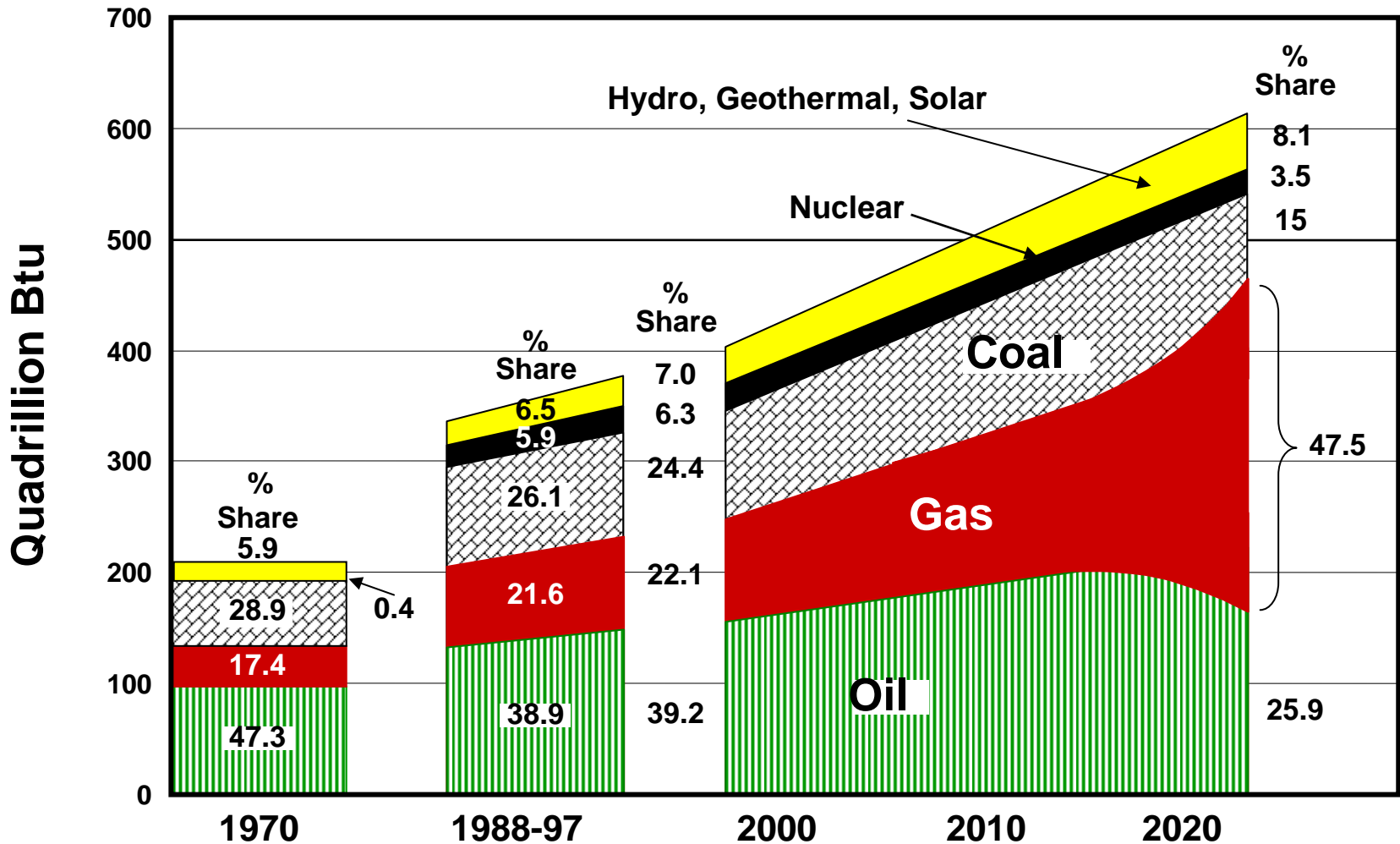
Source: JPT, May 2001.



# Current Energy Sources



# Sources of Energy



Source: JPT, May 2001.



# How Will We Satisfy Future Energy Demand?

- ✓ Unconventional oil
- ✓ Natural Gas
- ✓ Clean coal
- ✓ Renewable resources
  - Solar, Wind, Hydro
- ✓ Nuclear

For the foreseeable future (20 years) fossil energy is going to play a dominant role in our energy mix.



# Important Trends

- ✓ Worldwide energy demand will continue to increase sharply (3 to 5% per annum).
- ✓ We will be increasingly supply limited with fossil energy continuing to be our primary energy source.
- ✓ Environmental concerns will remain important.

Meeting the world's energy demand is the biggest engineering challenge we face today. It will require massive investments in infrastructure, people and new technology.

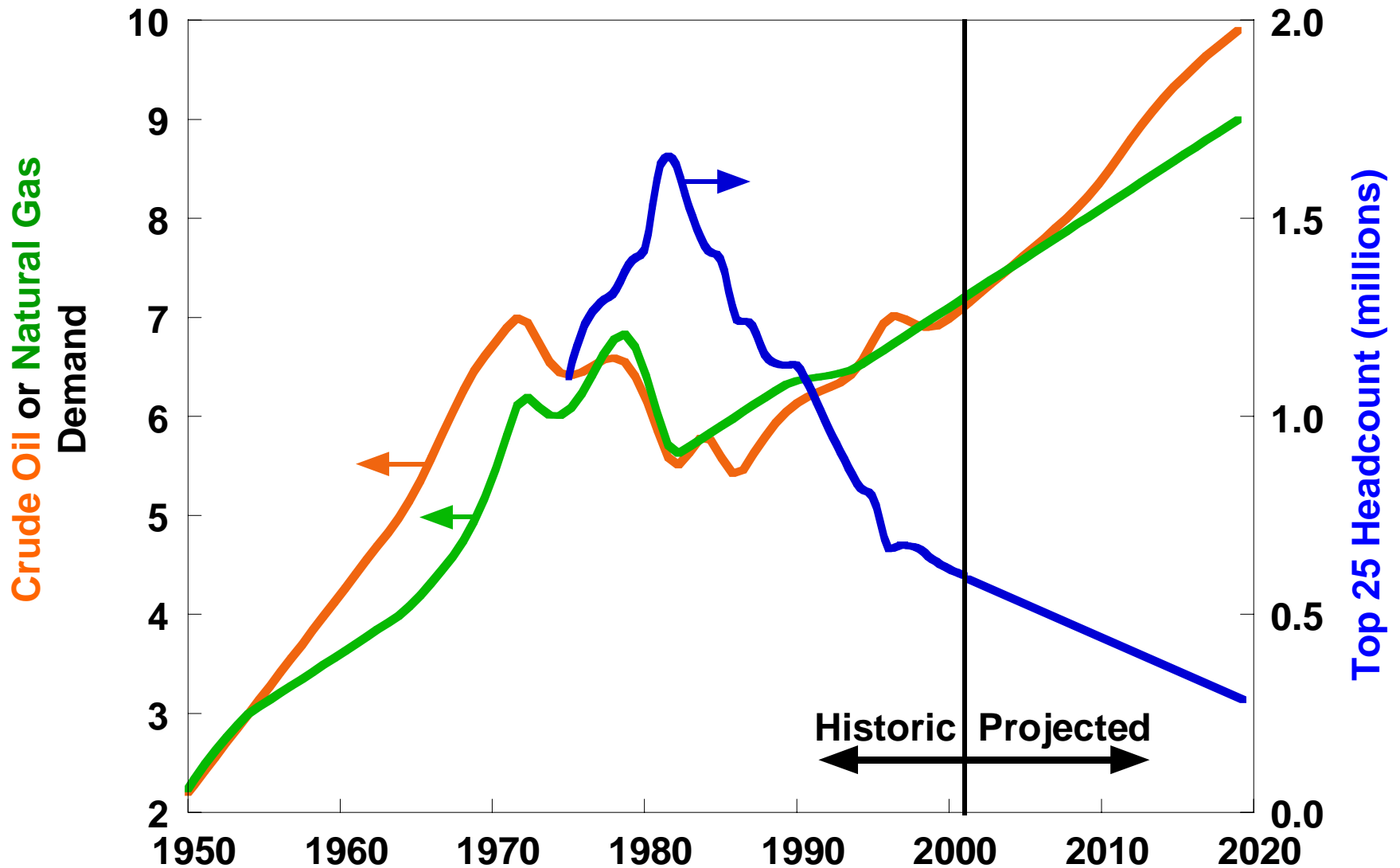


# What Can We do to Ensure a Reliable Supply of Energy?

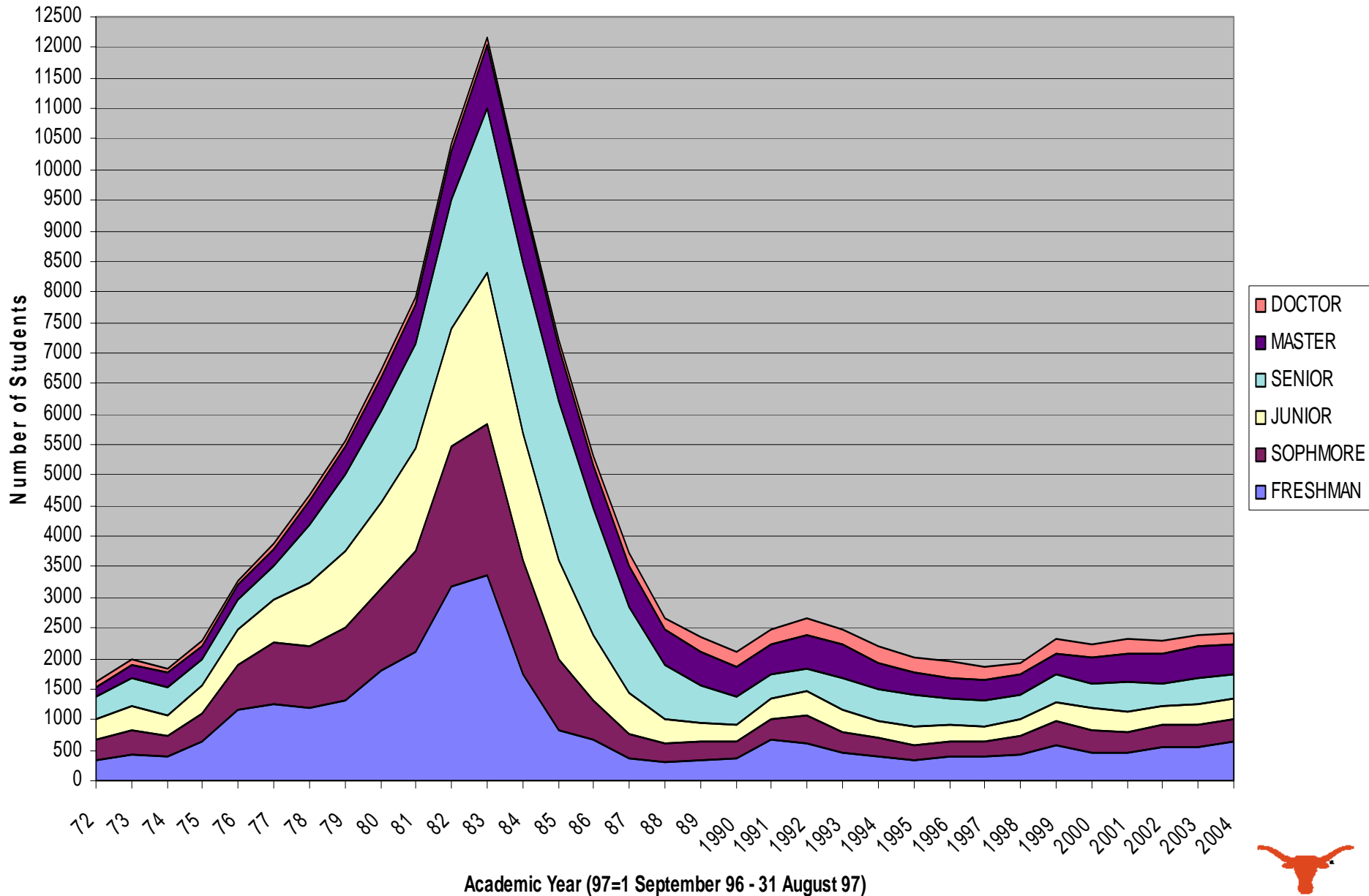
- ✓ Invest in a skilled workforce.
- ✓ Invest in technology.
- ✓ Invest in relationships with energy suppliers.
- ✓ Energy conservation.



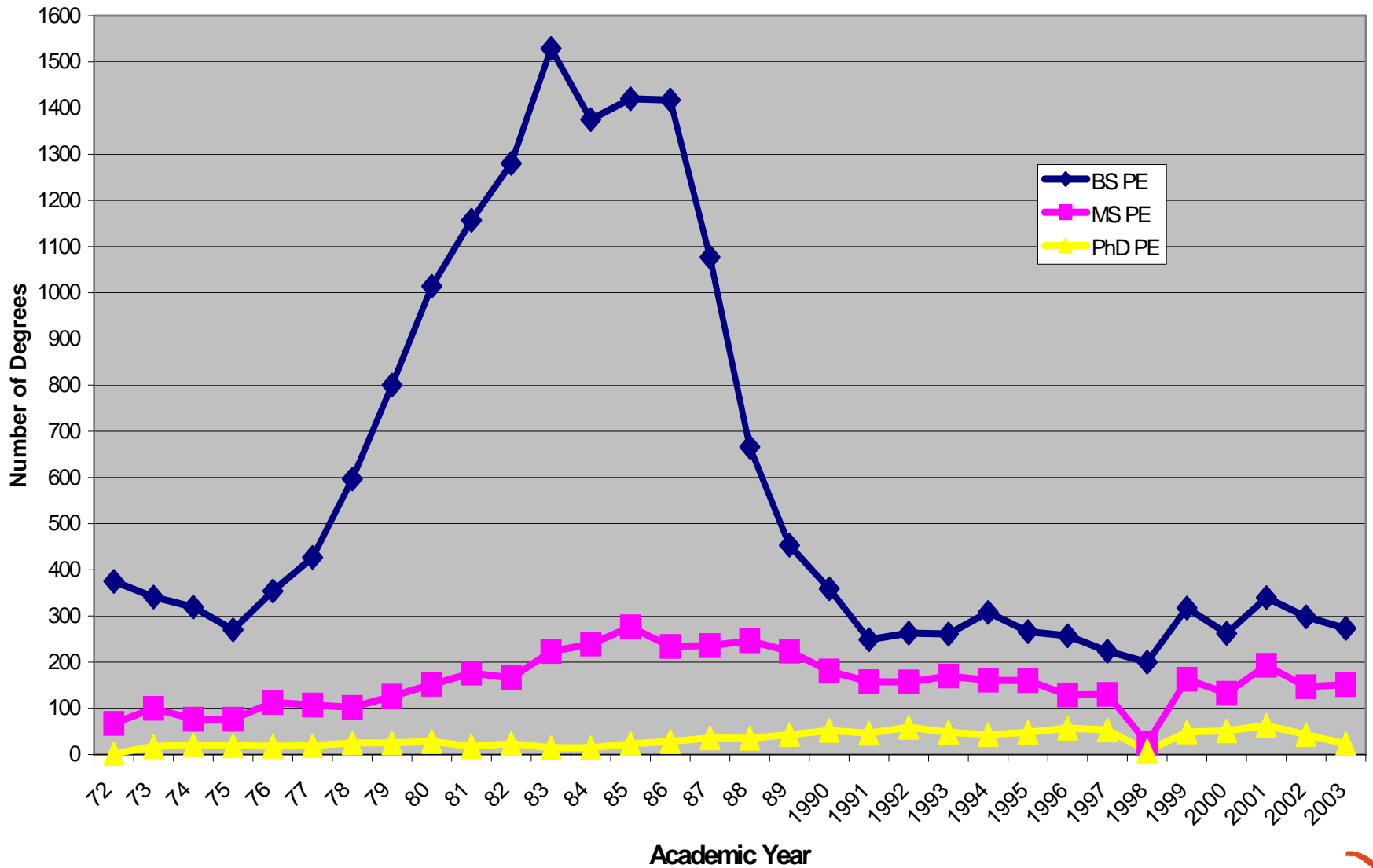
# Growing Demand, Shrinking Manpower



# US Petroleum Engineering Enrollment



# Petroleum Degrees Granted in USA



# Some Hard Facts

## About the Petroleum Industry

- ✓ An aging workforce – average age of SPE member is 52 and rising.
- ✓ 50% of current workers will retire in 5 years.
- ✓ 60% reduction in staff in the last 20 years.
- ✓ Fewer in-house training programs.
- ✓ Independents' access to trained personnel is limited.
- ✓ Industry is having difficulty attracting and keeping the best engineers.

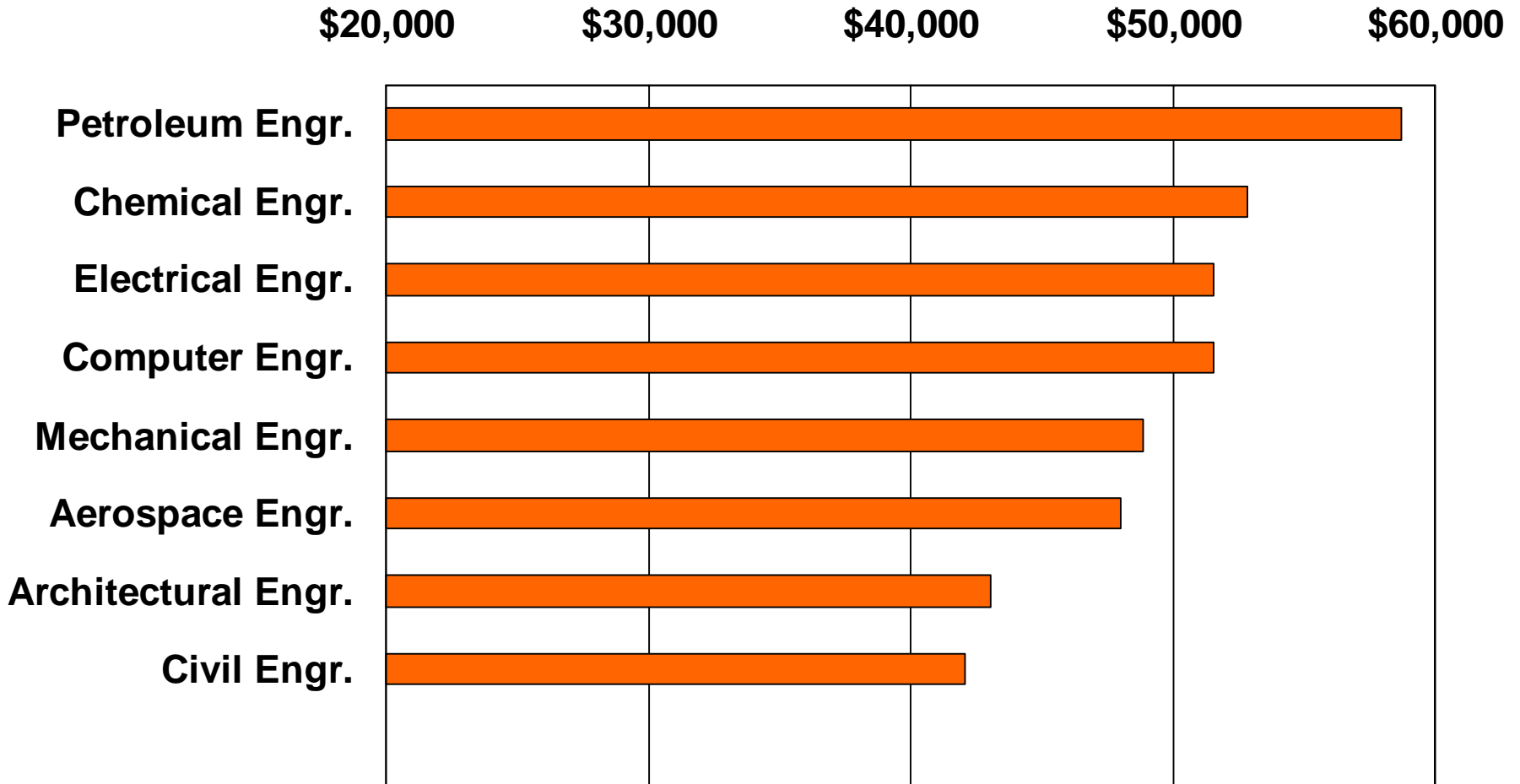


# The Shake-Out in Petroleum Engineering Education in the USA

- ✓ BS programs have decreased from 34 in 1982 to 19 in 2002 – a 44% decrease
- ✓ BS enrollment has decreased from 9,492 in 1982 to 1,602 in 2002 – an 83% decrease
- ✓ BS degrees granted have decreased from 1,280 in 1982 to 272 in 2002 – a 79% decrease



# Student Placement\*



\* Source: Summer 2004 Salary Survey, National Association of Colleges and Employers



# Getting the Message Out

## Addressing the Perception Issue

- ✓ The media does our industry no favors.
  - Dick Cheney (ex Halliburton CEO): “As a former member of Congress, I’m probably the only person whose image was improved by coming to the oil industry.” *OTC Panel Discussion*
- ✓ Most high school counselors are not aware of the opportunities in the E&P business.
- ✓ Industry needs to be proactive in getting the message out to our target audience.
- ✓ Target audience: High school seniors, their parents and counselors.
- ✓ Our experience is that once they hear our message they are hooked.



# Workforce Initiative

## An Investment Opportunity in Petroleum Engineering Education (A 5 year plan)

- Recruiting UG and G students
  - ✓ Scholarships and graduate fellowships
  - ✓ Visits to high schools and community colleges
  - ✓ Recruiting fairs and advertising
- Infrastructure improvements
- Curriculum Enhancement: Add Leadership, Teamwork, Commercial and Global Awareness
- Distance education
- Placement and corporate services



# Tangible Benefits for Participating Companies

- ✓ Corporate name recognition through:
  - Plaques / brochures / banners
  - Designated / targeted scholarships
  - Student recruiting material
  - An established presence on campus
- ✓ Special programs with students for participating companies
  - Recruiting seminars
  - Scholarship events
  - SPE events
  - Co-op and summer internship programs

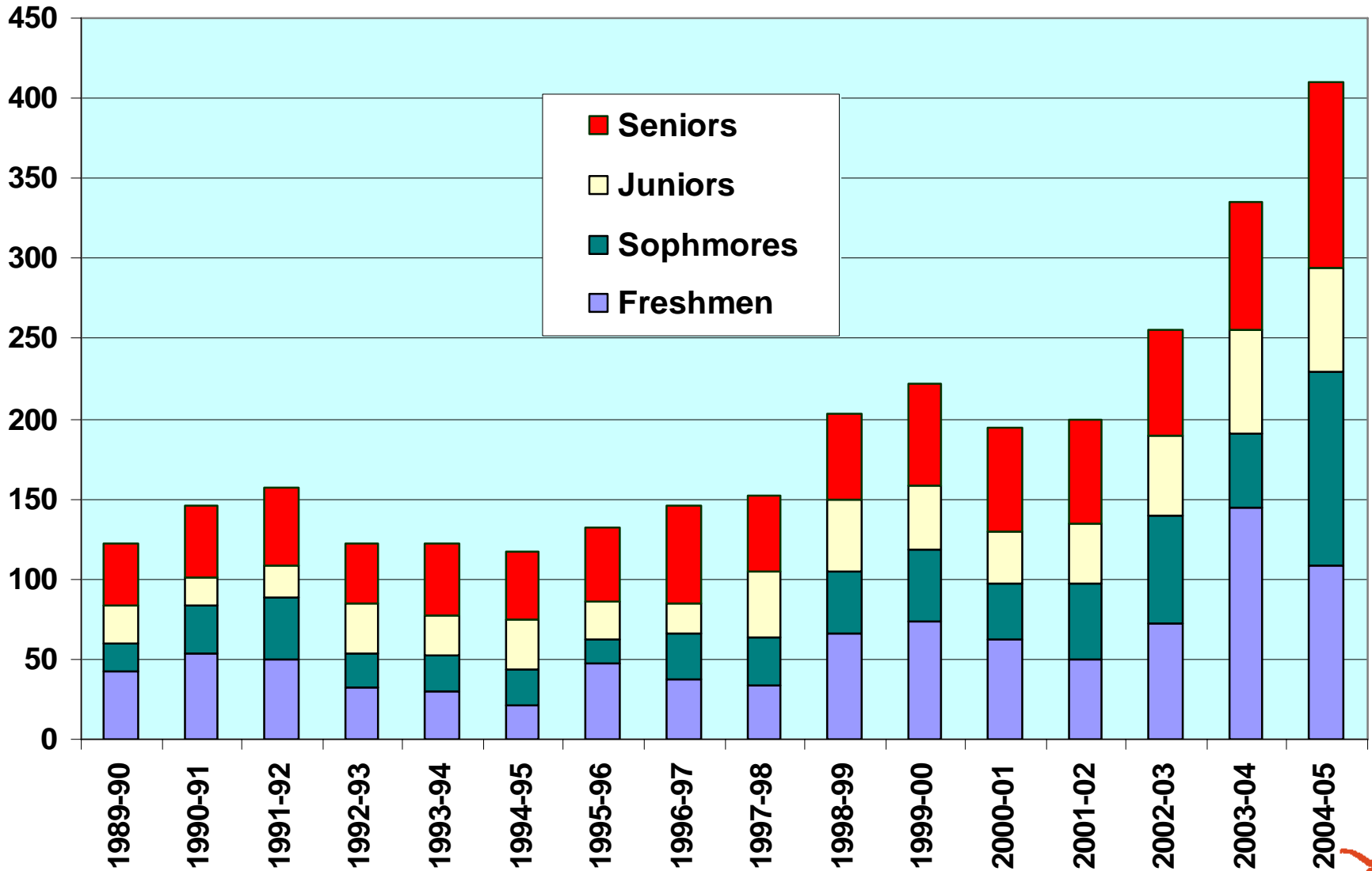


# Participating Companies

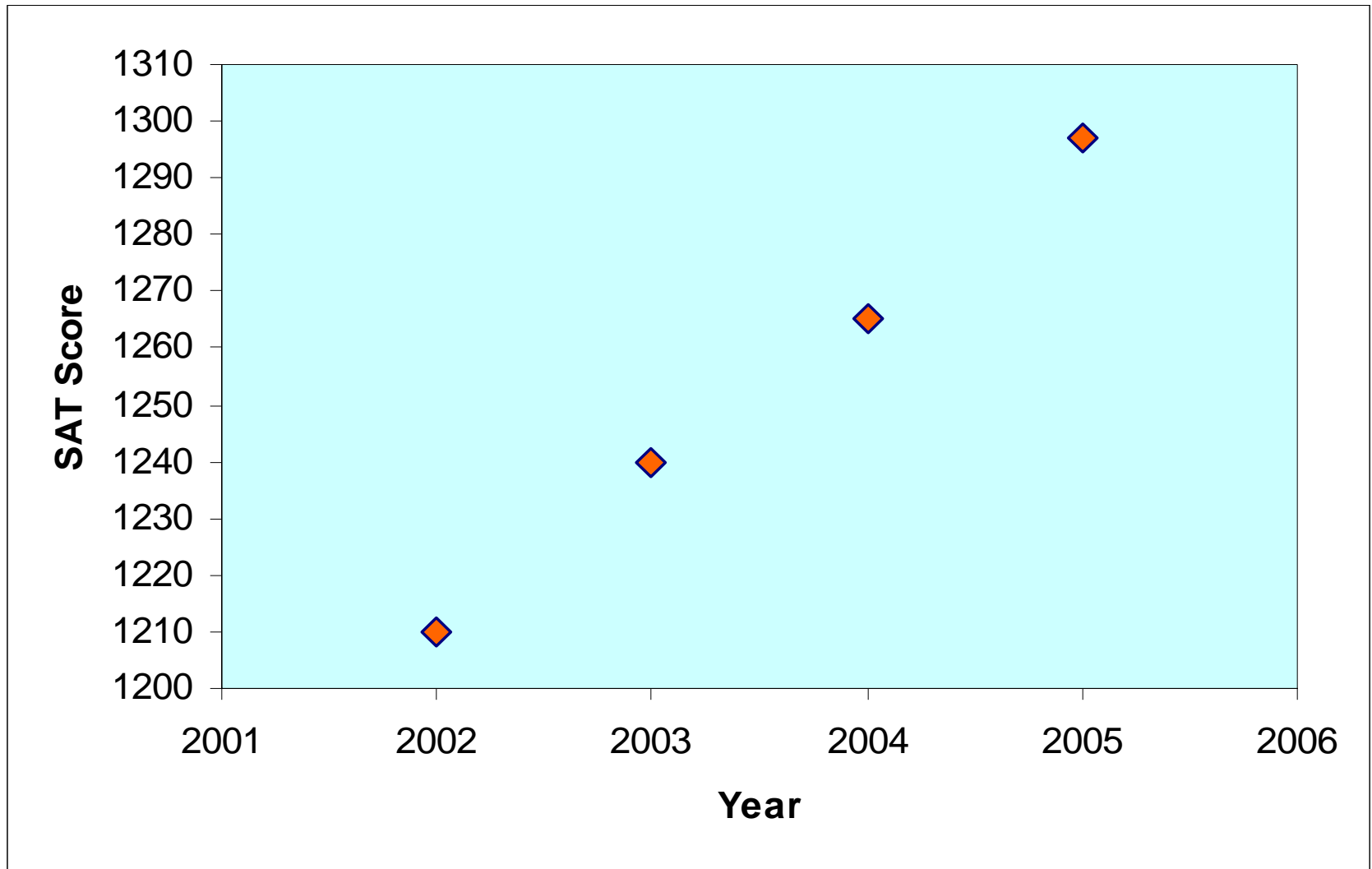
- ✓ Anadarko
- ✓ Baker Hughes
- ✓ ChevronTexaco
- ✓ ConocoPhillips
- ✓ Devon
- ✓ Dominion
- ✓ Encana
- ✓ EOG
- ✓ Hilcorp
- ✓ Nabors
- ✓ Norsk Hydro
- ✓ Pioneer
- ✓ Shell
- ✓ Unocal
- ✓ Walter Oil & Gas
- ✓ XTO



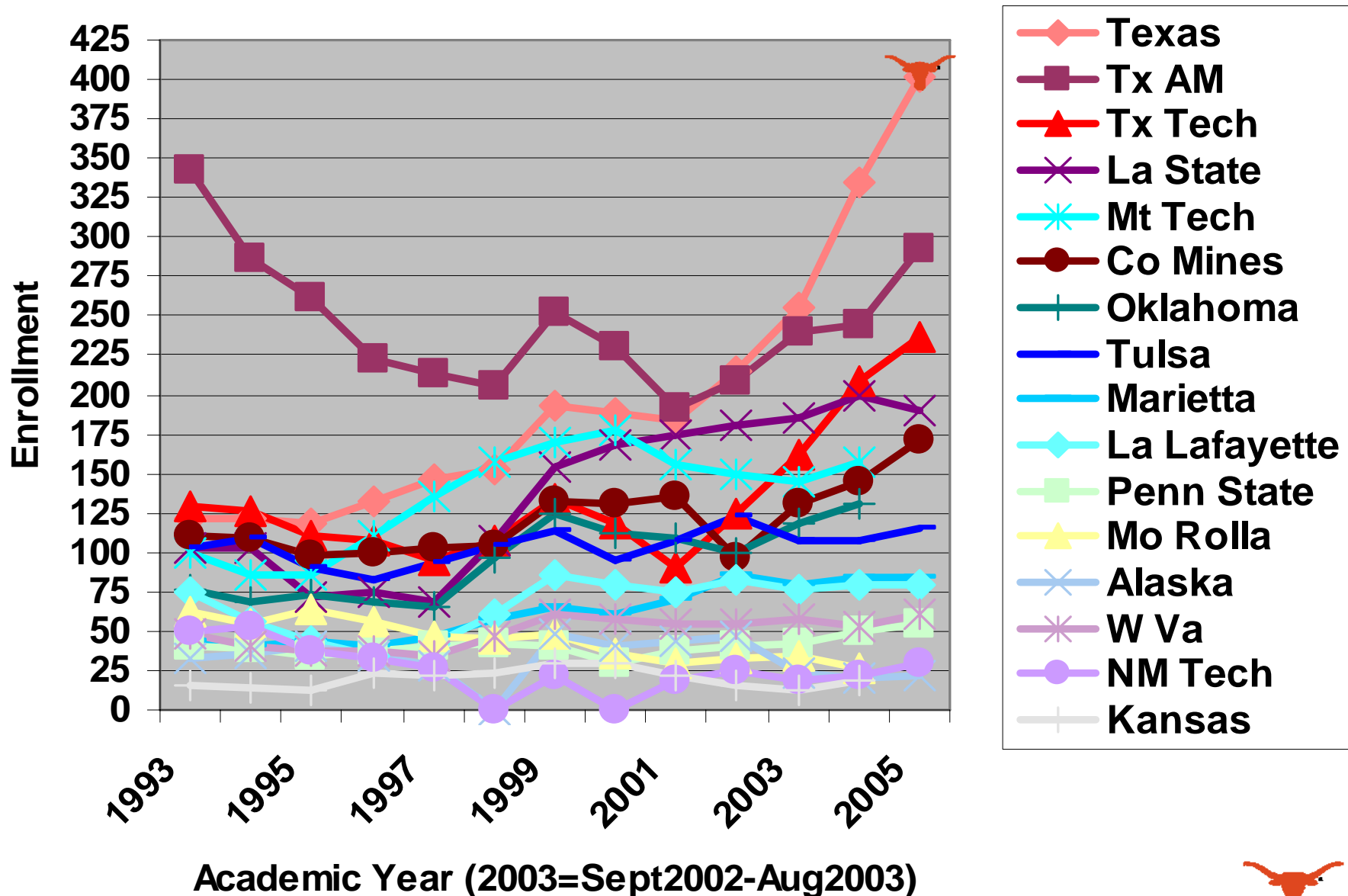
# UT-PGE Undergraduate Enrollment



# Quality of the Freshman Class



# UG Enrollment, US PE



# What Can We do to Ensure a Reliable Supply of Energy?

- ✓ Invest in a skilled workforce.
- ✓ Invest in technology.
- ✓ Invest in relationships with energy suppliers.
- ✓ Energy conservation.

I am sad to say that we (the US) are not doing nearly enough in any of the above.



# Our Technology Thrusts

- ✓ Natural gas engineering
  - Gas condensate reservoirs
  - Tight gas, coal bed methane, gas shales
  - Gas reservoir / well management
  - Gas hydrates
- ✓ Improved oil recovery
- ✓ Heavy oil
- ✓ Energy and the environment
  - CO<sub>2</sub> injection / sequestration
  - Produced water handling, re-injection
  - Subsurface remediation



# New Initiatives

- ✓ Workforce Initiative
- ✓ New technology initiatives, DOE grants.
- ✓ Graduate recruiting
  - 5-year BS-MS program
  - Executive MS program
  - Graduate fellowships
- ✓ New undergraduate curriculum
- ✓ Shell-Longhorn training camp
- ✓ Halliburton-Longhorn training camp
- ✓ University of Trinidad and Tobago



# “It ain’t bragging if its true”

## Department of Petroleum and Geosystems Engineering

- # 1 ranked graduate program in the US.
- Largest undergraduate program in the US.
- Largest PhD program in the world.
- 30 alumni are petroleum engineering faculty members at other universities
- 5 of 17 faculty are members of National Academy of Engineering
- About 4000 living alumni world-wide



# Priorities / Needs for the Department

- ✓ Continuously improve student quality
  - More scholarships / graduate fellowships
  - More summer internships
- ✓ Faculty recruiting
- ✓ Maintain leadership in key technology areas:
  - Natural gas engineering
  - Improved oil recovery
  - Energy and the environment
  - Heavy oil
- ✓ Generate endowment resources



# What Would it Take to Make UT The “Energy University”

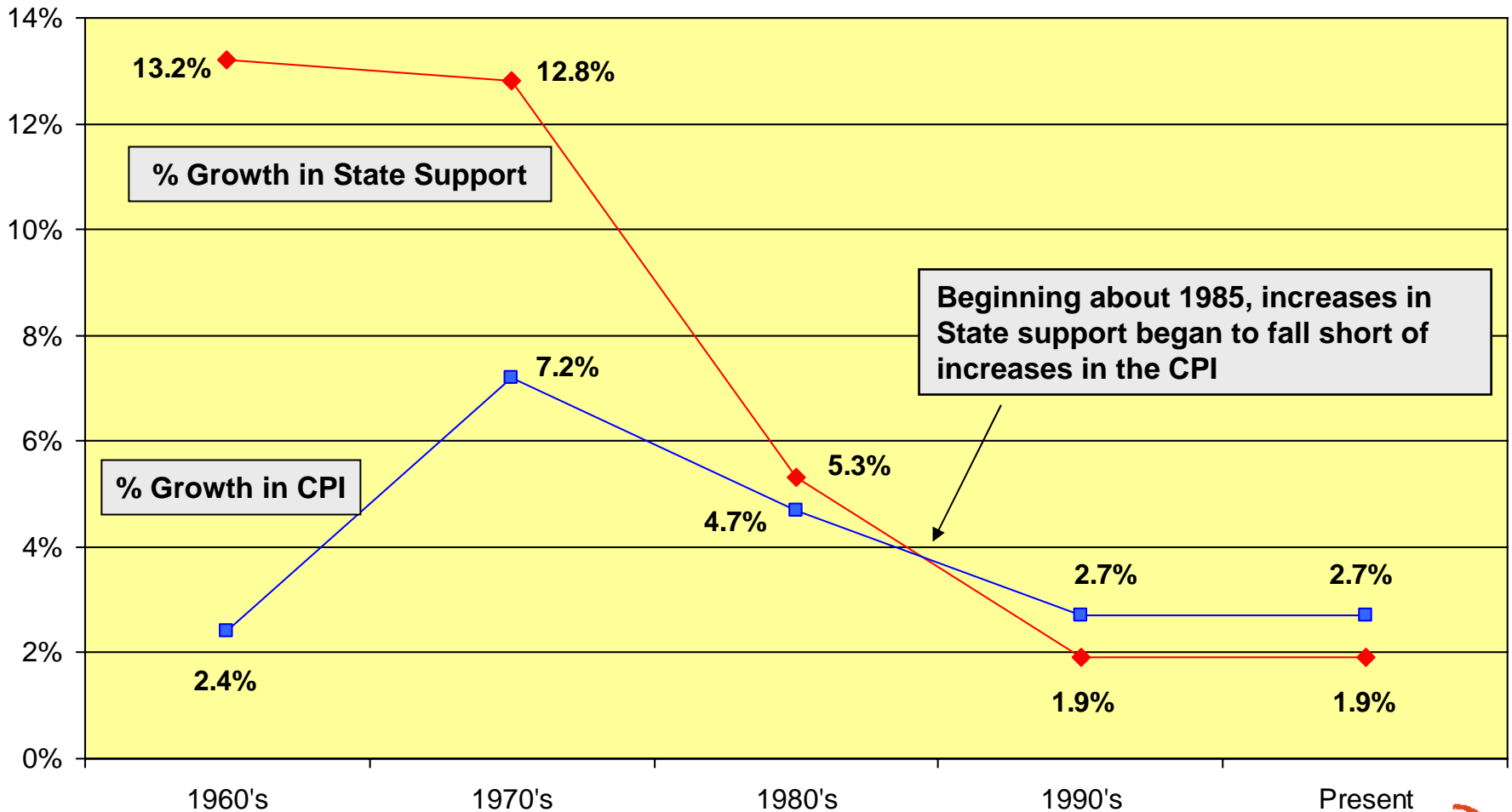
- ✓ Focus on “energy supply”.
- ✓ Identify key resources and technology and policy aspects of each resource.
- ✓ Expand and coordinate programs across Colleges for these key resources.

Your financial and in-kind support.



# Historical Trends in State Financial Support

*Growth in State General Revenue for UT vs. Growth in the Consumer Price Index*



# Historical Trends in State Financial Support

## *State Funding as a Percentage of the Total University Budget*

(in millions)	30 Years <u>1972/73</u>	20 Years <u>1982/83</u>	10 Years <u>1992/93</u>	Today <u>2004/05</u>
State Funding	\$ 57.9	\$ 168.8	\$ 207.7	\$ 291.9
Total Budget	\$ 119.9	\$ 360.6	\$ 726.9	\$ 1,567.5
<b>Percent State Funding</b>	<b>48.3%</b>	<b>46.8%</b>	<b>28.6%</b>	<b>18.6%</b>

# How You Can Help

- ✓ Join UT's Workforce Initiative
  - (\$30,000 per year).
- ✓ Provide summer internships to qualified students.
- ✓ Individual contributions
  - PGE Annual Excellence Fund
  - Endowments
- ✓ Be actively involved in recruiting outstanding students.



Thank You

