



Global Summit Future of Mechanical Engineering

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What we will cover.....



- One group's view – 3 key points
- A few facts and some data
- What a sister society (AIChE) is doing about its future
- A diversity success story...
- Some perspectives.....

One group's view.....



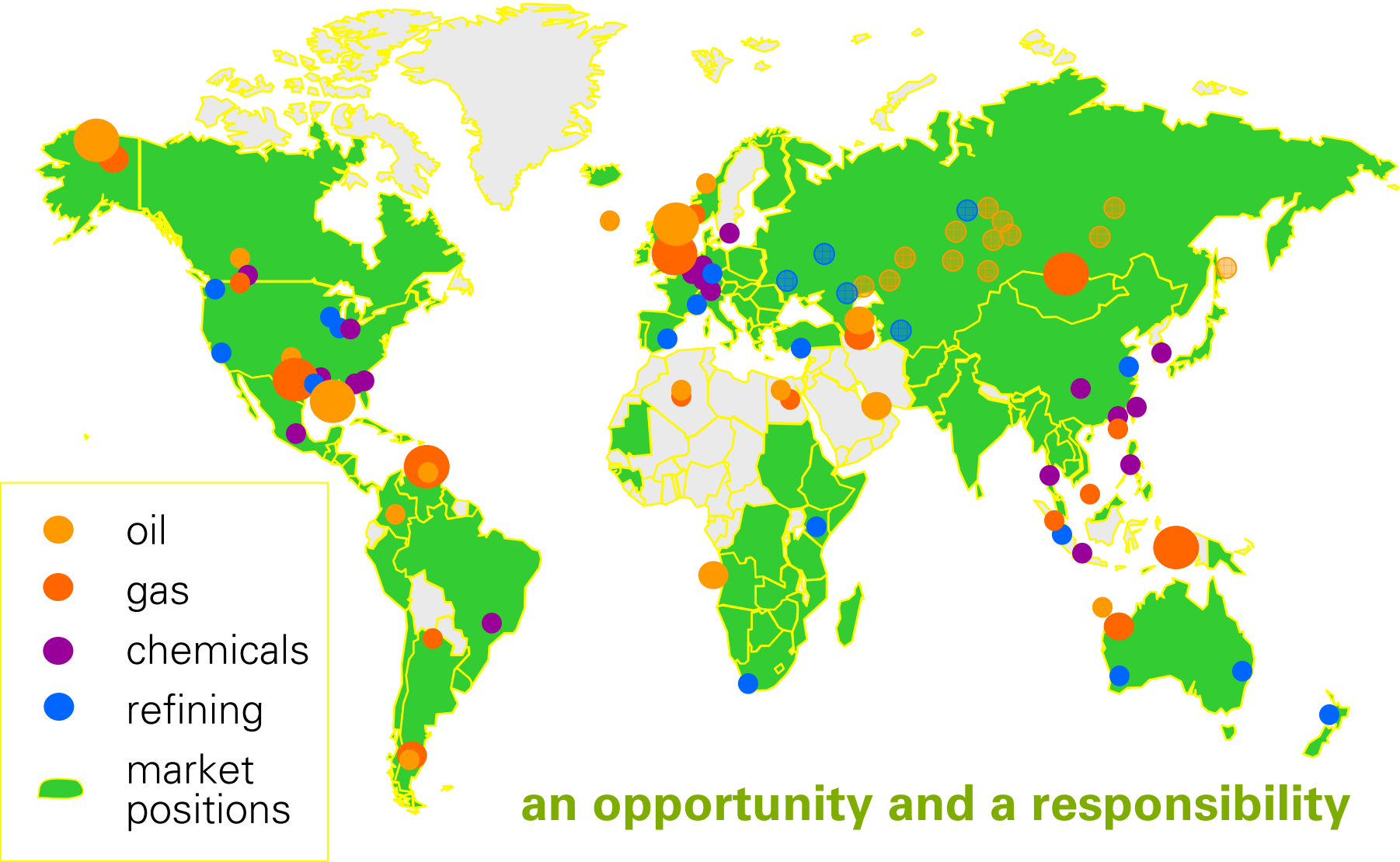
Mechanical Engineers in the future will need to be:

- More international in scope; able to understand other's perspectives easily
- Intra and Interdisciplinary; able to work across wide span of subject and geography, inclusive of other types of engineering
- Deeply technical; however, communications and translators will make these skills easier to globally leverage (will need language support)

ME's @ bp are involved....!



bp's global presence



an opportunity and a responsibility

Some facts.....



Consider.....

- The largest company in the world is based in London
- Energy, mobility and food remain basic human needs
- Forward progress is occurring all over
- Approximately 10 – 34% of US Citizens hold a passport
- Every year India creates another Australia
- CNN in the USA is different than CNN other places

Forbes' Global 2000 Public Firms (2007)



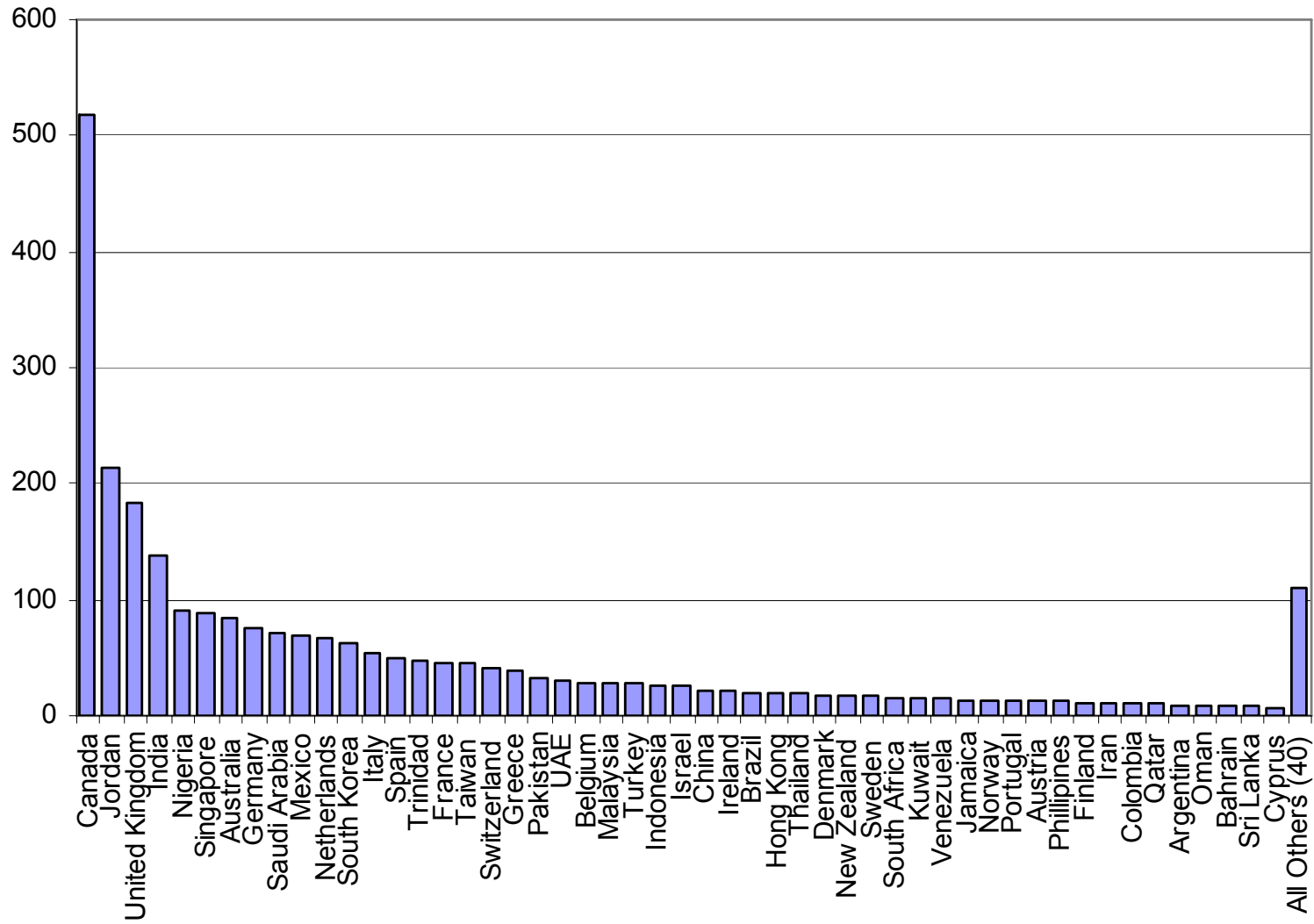
USA	598	Russia	29
Japan	259	Sweden	29
United Kingdom	123	Bermuda	24
China	70	South Africa	19
France	67	Singapore	18
Canada	59	Finland	16
Germany	59	Norway	14
South Korea	52	Turkey	14
Australia	51	Greece, Belgium	12
India	48	UAE	11
Taiwan	42	Saudi Arabia	11
Hong Kong	39	Israel	10
Brazil	34	Luxembourg	8



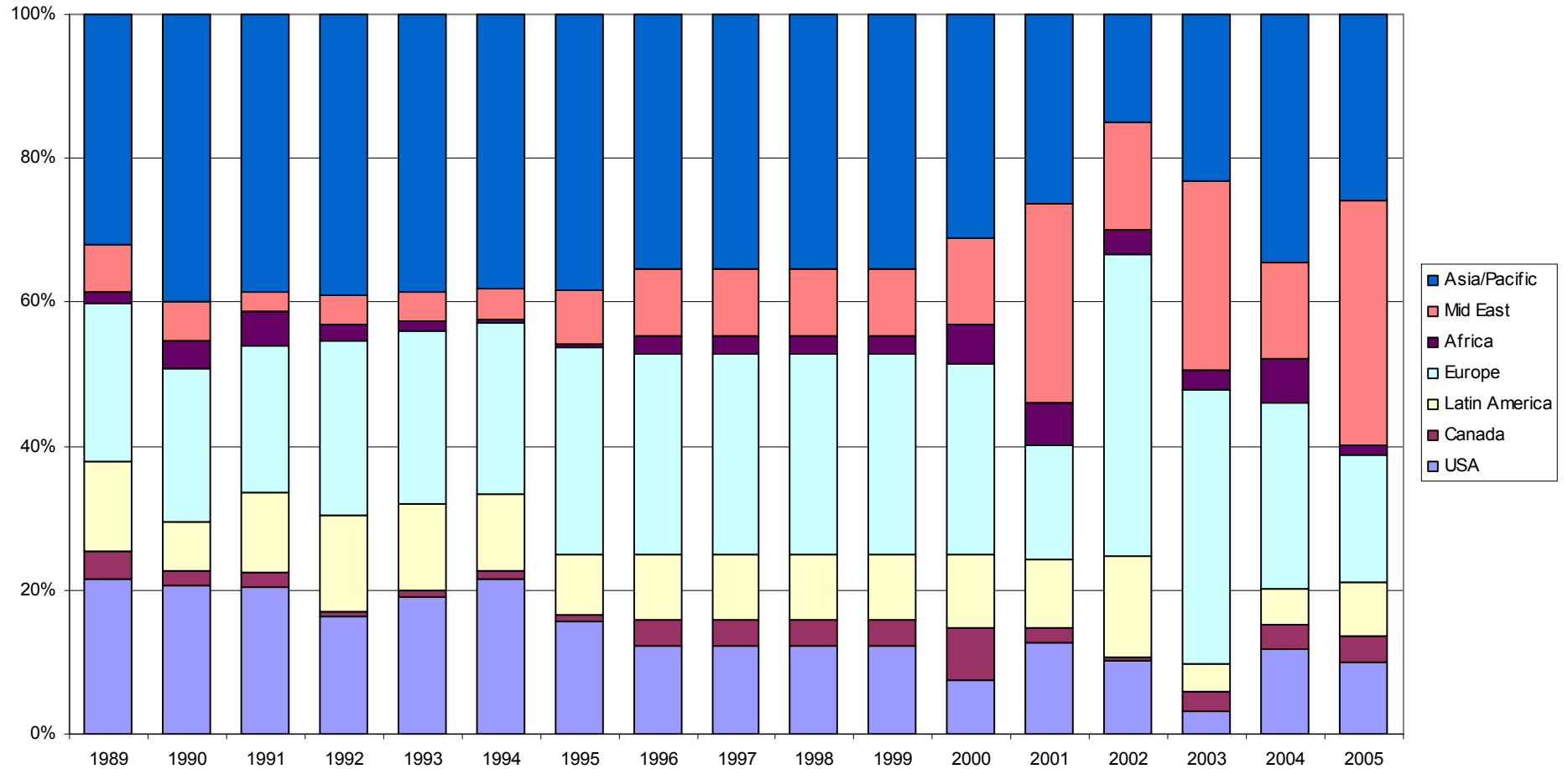
AIChE – International Efforts

3 years into a forever agenda

AIChE Members currently not in the USA



New Capital Investment in Refining and Chemicals



Prioritization Results



1. India
2. China
3. Canada
4. United Kingdom
5. Japan
6. Pakistan
7. Australia
8. Nigeria
9. Bangladesh
10. Saudi Arabia
11. Ethiopia
12. Malaysia
13. South Africa
14. Dem Rep Congo
15. Indonesia
16. Israel
17. Kenya
18. Ireland
19. Uganda
20. Ghana

Top ideas



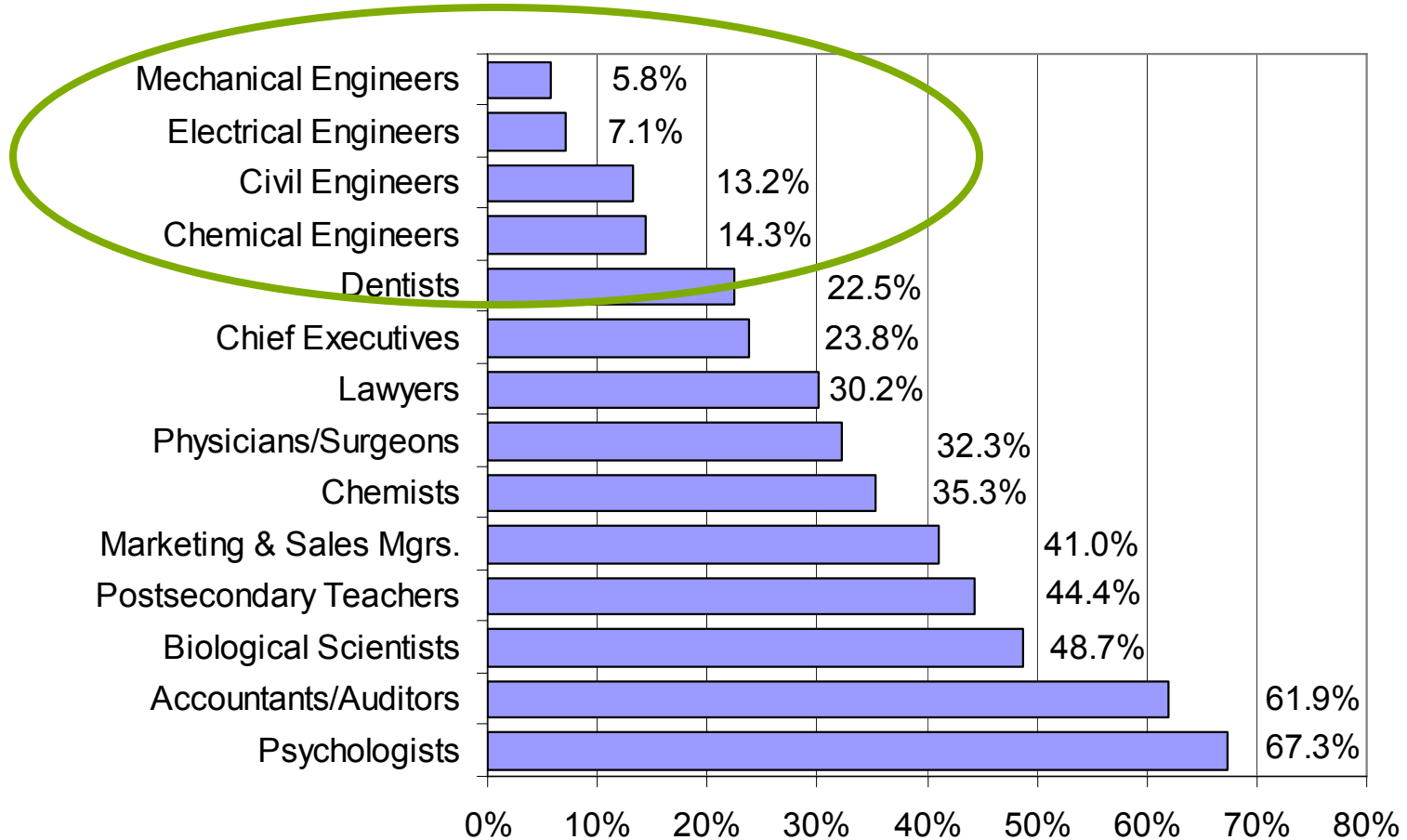
- Resale and packaging of health, safety, process safety and environmental laws and regulations
- Travel and security services for smaller companies
- US business model need to be addressed for offshore membership
- Design a more electronic membership offering for overseas members; web translations available
- Build into the membership price the cost to come to meetings
- Chinese/Indian/Russian process safety training
- Strengthen the World Chemical Engineering Council
- Investigate formalized credentialing for all engineers



Diversity Success Story

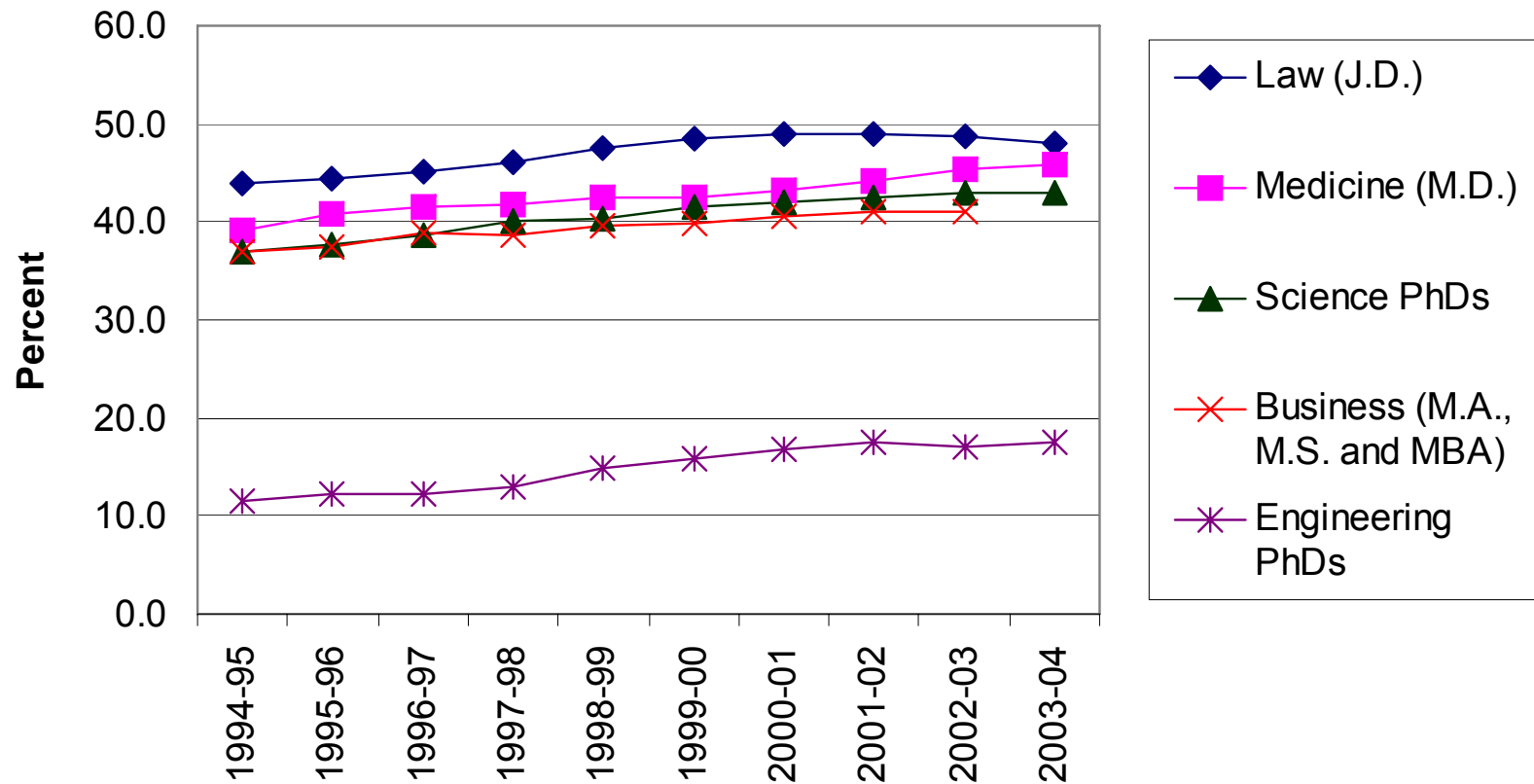
More action required

Women in Selected Occupations 2005



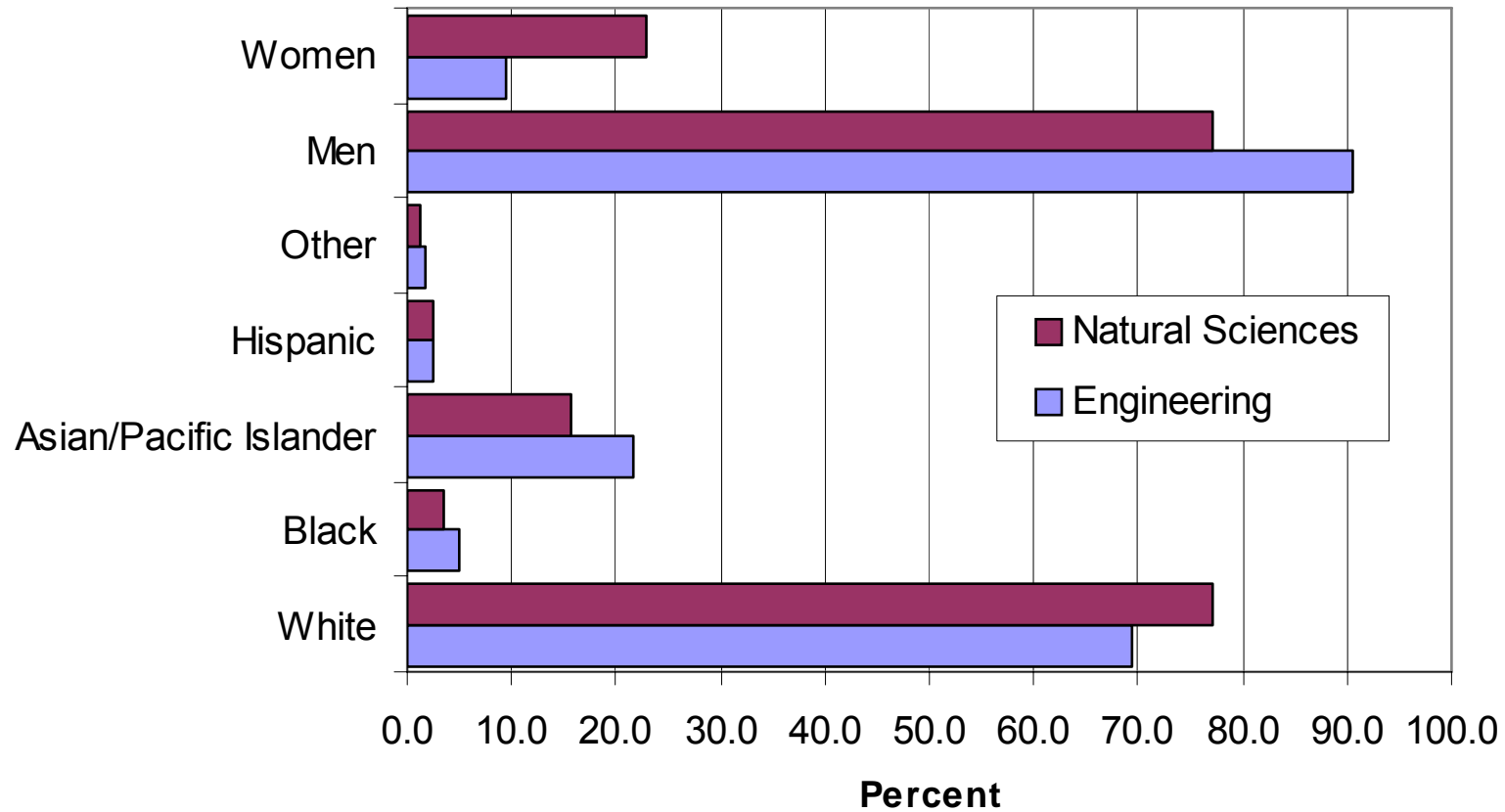
Source: CPST, data derived from Bureau of Labor Statistics

Why do other fields attract more?



Source: CPST, data derived from National Science Foundation, National Center for Education Statistics, American Bar Association and Association of American Medical Colleges.

Women and Minorities in Academe



Source: CPST, data derived from National Center for Education Statistics, NSOPF

Workplace Retention Study Results (SWE and Harris)



- 93% of practicing engineers (men and women) view education & career positively
 - Women more satisfied with content and challenge
 - Women less satisfied with their management and advancement opportunities
- Women are twice as likely as men to earn less than \$50K; half as likely to earn \$100K+
- Women earning \$100K+ have double the satisfaction when compared with other women
- Women stay in engineering for 6 years before leaving, men for 5 years

Workplace Retention Study Results (SWE and Harris)



- 77% of women and 79% men say they are satisfied with their work
- Two major reasons why engineers left engineering: employers and supervisors
- Women are twice as likely to perceive that gender inequities exist
- Top reason both men and women leave engineering is to obtain higher salaries
- Women are 2x more likely than men to cite work/family conflict as a problem.

Diversity Success Story



- US Top 25 engineering school
- A decade ago -- losing women and minority students
- A decade ago -- difficult to retain women & minority faculty
- Partner company insisted on and sponsored a diversity workshop for faculty, effort started in 1996

And the results were.....

- Two successive female Deans of Engineering
- First African American EE Department Head
- Significant increase in women & minority faculty
- University firsts: female Provost & female President
- Increased levels of women and minority students

Quantitative Results



	1995	2006
Women Engr Faculty	7.1%	12.7%
Total Faculty/% Female	1708/20.1	1832/24.1
Minority Faculty	11.4%	19.7%
Female Deans of Engr	0	2
Women Science Faculty	10.0%	15.8%
Engr Dept Heads	0	3 of 13
Asst/Assoc Deans of Engr	0	3

How did this happen.....?

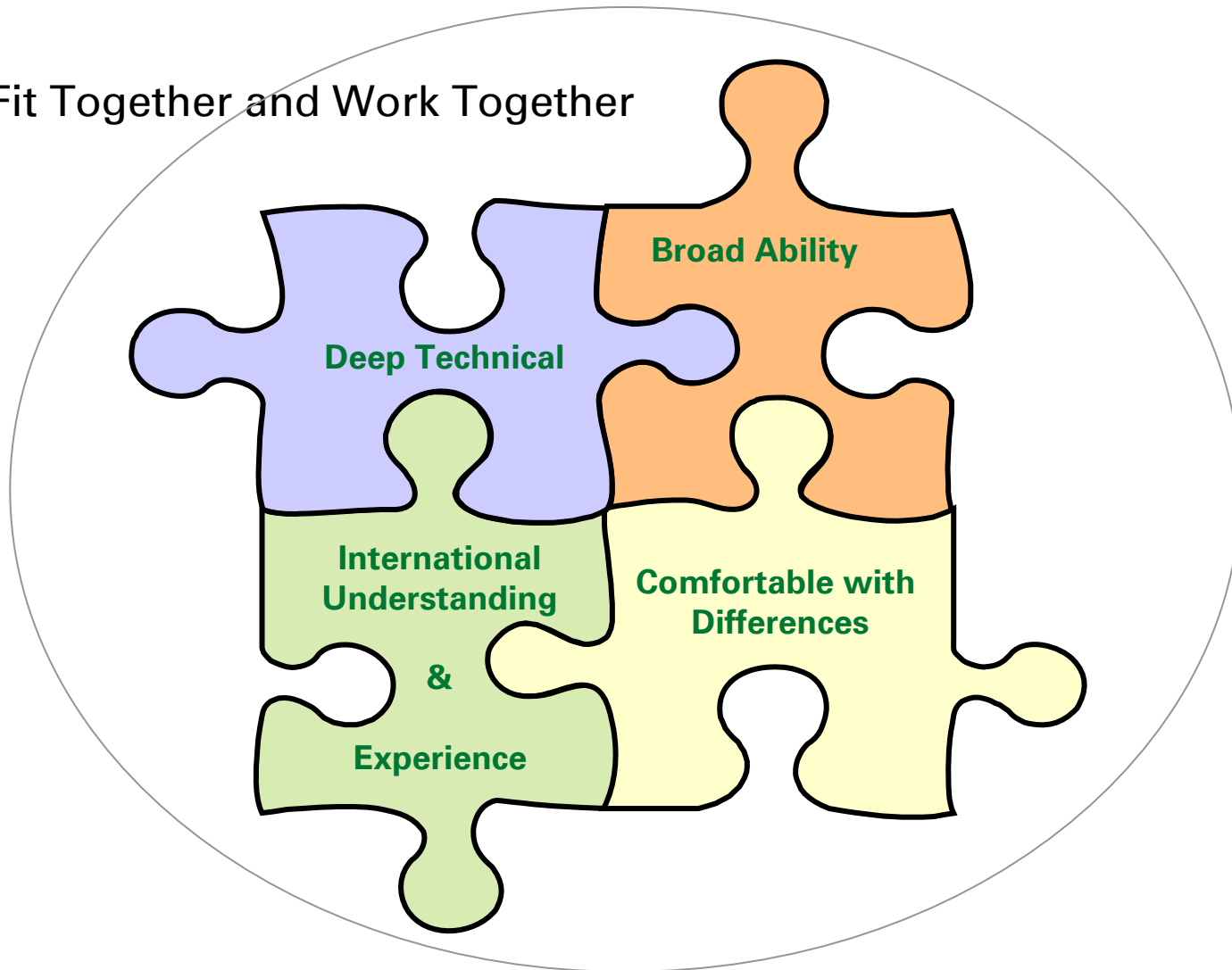


- A white woman that was trusted spoke truth to power
- A few key white men agreed with her in open forum
- Respected professor volunteered; had internal credibility
- Supported and active industrial/academic collaboration
 - Participation
 - Funding
- Dominant culture supportive, active
- Changes in university administration sustained progress

Vision: Strong Mechanical Engineering



Pieces Fit Together and Work Together





Thank You!!

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