

AIChE®



What Are Chemical Engineers doing About Energy? “Energy Steward” – AICHE Energy Survey Results

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Research & New Technology Committee
CTOC/NED Director
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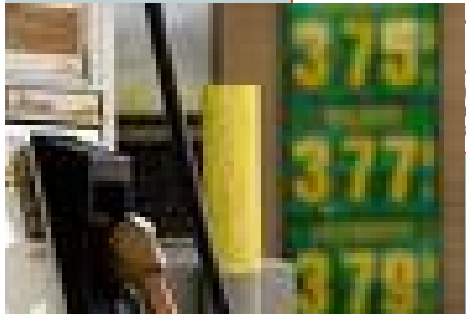
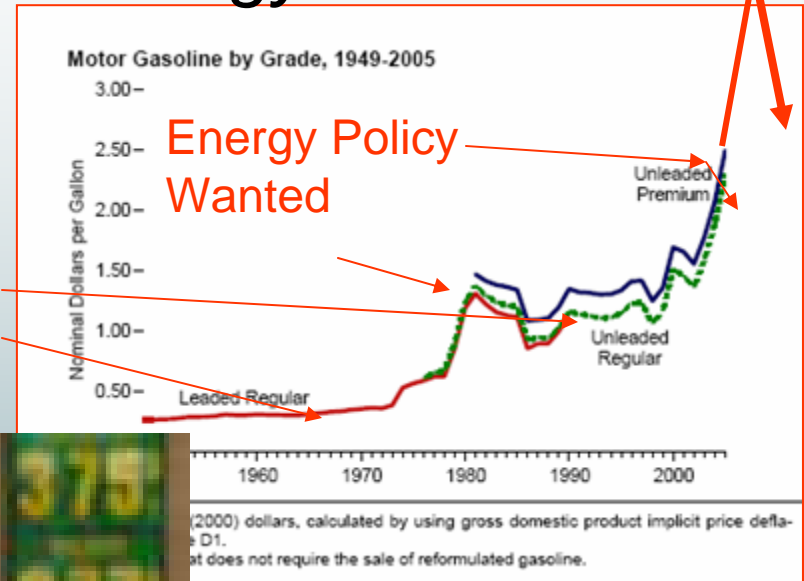
1st Gulf War-Example 1991 – How Quickly did this Picture Fade from our Minds?

- The U.S. imports more than 50 % of its crude oil and is expected to import more than 60% by 2010.
- U.S. Consumers pay foreign countries over two billion dollars a week to satisfy the demand for imported oil
- Much of our oil is imported from politically unstable areas of the world.

Photo: Oil fires in Kuwait following Desert Storm

Energy Policy is Set in Time of Need- *Will Recent Fall in Crude Oil Prices Affect Need For Large Capital Outlays in Energy?*

- Gasoline Price Trend



Gasoline Prices Change Very Fast – Interest in Energy Declines When Price is Low



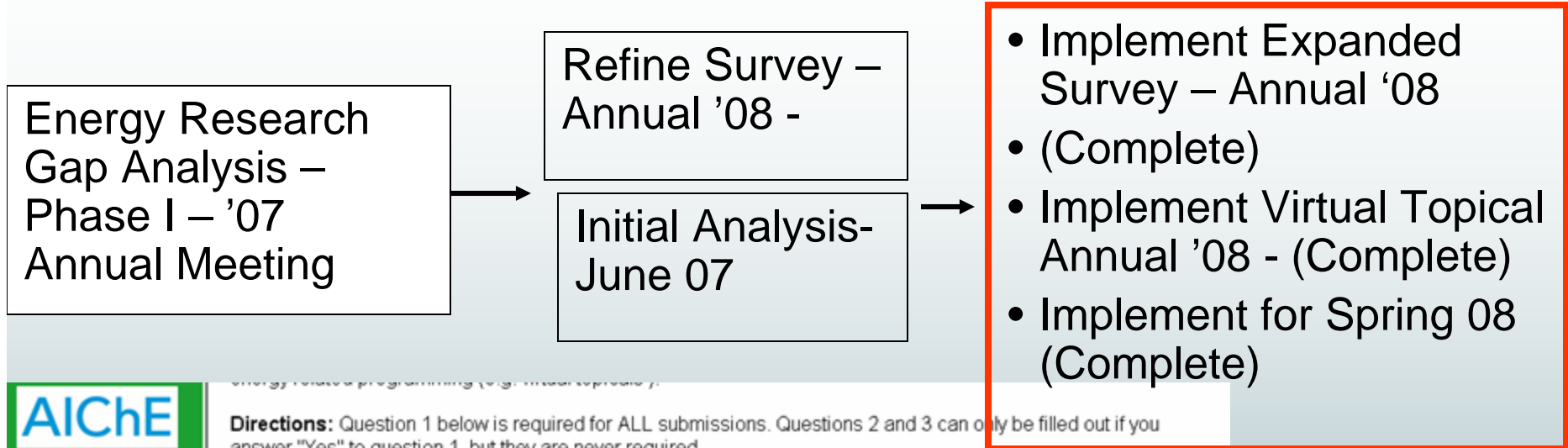
RANTC Energy Steward Concept

- “Energy Steward” is a Fair & Foul Weather Promoter of Energy Initiatives within the Institute – Waves Energy Flag When Prices Are High or Low
- Promotes AICHE Missions/Objectives through *Additional & More Unified Energy Programming*
- *Facilitates Partnerships Among Divisions within AICHE who Are Interest in Energy Programming*
- Advertises & Seeks to Unite Divisions Through Publication of Energy Information
- Current Focus
 - Energy Survey-Gaps Analysis
 - Collect Programming Content for Web
 - Virtual Topical



Hugh Roy Cullen – Discovered “Tom O’Conner” Field in South Texas in 1932

Energy Steward – Energy Survey



AIChE
Abstract Control Panel

ID: 84619
Password: 724532
6 Steps to submit an abstract:

1. **Select Topic**
2. Title
3. Author
4. Abstract Text
5. Energy Research Analysis
6. Confirmation

Options:
[View Submission](#)
[Withdraw](#)

Submit another abstract:
[Same Group](#)

Help:
[Instructions](#)
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Energy related programming (e.g. mixed process):

Directions: Question 1 below is required for ALL submissions. Questions 2 and 3 can only be filled out if you answer "Yes" to question 1, but they are never required.

1) Is your paper related to existing technology or advanced technology associated with the overall use and supply of energy or global climate change research? (e.g. enhanced production/ utilization of fossil, renewable or nuclear; energy efficiency, refinement into feed stocks or products; green house gas sequestration, capture or monitoring)
 Yes No

2) Is your paper related to fossil, renewable or nuclear energy?
Check one, if other provide keyword (e.g. solar/nuclear)
 Fossil
 Renewable
 Nuclear
 Other: _____

3) Is your paper related to Global Climate Change?
Check those that apply.
 Carbon Sequestration
 Carbon Capture
 Carbon Monitoring/Modal
 Other Greenhouse Gas Emissions
 Other: _____

Submit

Initial Energy Survey – Broaden Survey Questions for Spring 08(Annual 07) to Better Understand Programming Content

CEP Article & Virtual Topical



WHAT ARE CHEMICAL ENGINEERS DOING ABOUT ENERGY?

T. BOND CALL

The global demand for energy, coupled with concern about climate change, has led to an explosion in interest in energy research, use, production and policy. Chemical engineers, from the moment we take courses in mass and energy balances, are involved with energy and the environment.

AIChE's Board of Directors recognized the interest in energy within the Institute, and based on its internal report, "Recommendations for AIChE's Energy Strategy, 2006," began to implement strategies that would help ensure that chemical engineers play a central — even pre-eminent — role in advancing energy research and technology.

AIChE's first annual energy survey is one of many efforts that arose from this focus on energy. Sponsored by the Research and New Technology Committee (RANTC), the energy survey aims to guide AIChE's technical programming efforts related to energy. In addition, since one of RANTC's missions is to

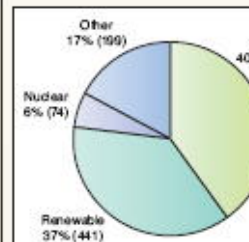


Figure 1. An assessment of recent AIChE meeting programming shows that a diverse and balanced array of energy-related topics was presented. The "Other" category includes topics that cut across many energy types (such as catalyst development, gasification and basic energy sciences).

this most basic question, the first energy survey used AIChE's conference planning tool, CONFEX, to query each author who had submitted a paper to the 2007 Annual Meeting.

The survey consisted of three main questions:

Drop-down text-related ke could use to f submitted paper. I author decided to renewable e wind, solar, bi biodiesel, othe renewable res

- Topical Conferences
- Core Programming
- Centennial
- Committee Meetings/Special Events
- Energy-Related Papers
- Fundraising Gala
- Plan Your Trip
- Calendar
- Contacts

AIChE 100
Annual Meeting, Philadelphia

November 16-21, 2008
Loews Philadelphia Hotel,
Philadelphia Marriott Downtown &
Pennsylvania Convention Center
Philadelphia, PA

Day	Time	Paper #	Paper Title	Property	Room
Sunday	1:00 PM	5q	Electrochemically Induced Charge Transfer to Wide Band Gap Semiconductors and its Implication to Nanowire Based Solar Cells	PNCC	Exhibit Hall A
Sunday	1:00 PM	5e	Polymer Thin Film Nanoassemblies for Electrochemical Energy Conversion Devices	PNCC	Exhibit Hall A
Sunday	1:00 PM	5cv	Preparation of Heterogeneous Nanostructures for Catalytic and Magnetic Applications	PNCC	Exhibit Hall A

AIChE[®]100

Chapter 10 AIChE's Energy Initiative

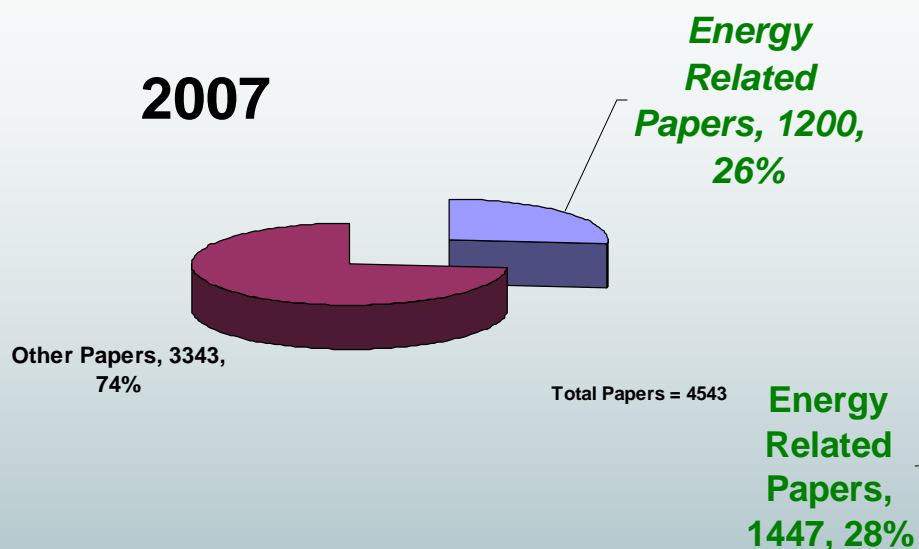
By John C. Chen, Dale Keairns, and Bond Calloway

Links

- [PDF Registration Form](#)
- [Extended Paper Upload](#)
- [Technical Program](#)
- [Organizers Login](#)
- [Programming Contacts](#)
- [Programming Timetable](#)
- [Call for Papers](#)

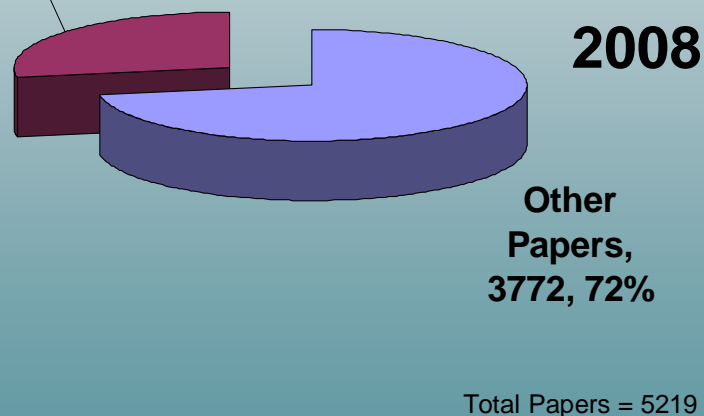
- station
- 112-A
- 304-A
- 303-B
- 118
- 302-B
- Trace Room
- Health C
- Room

AICHE Energy Survey Overview -



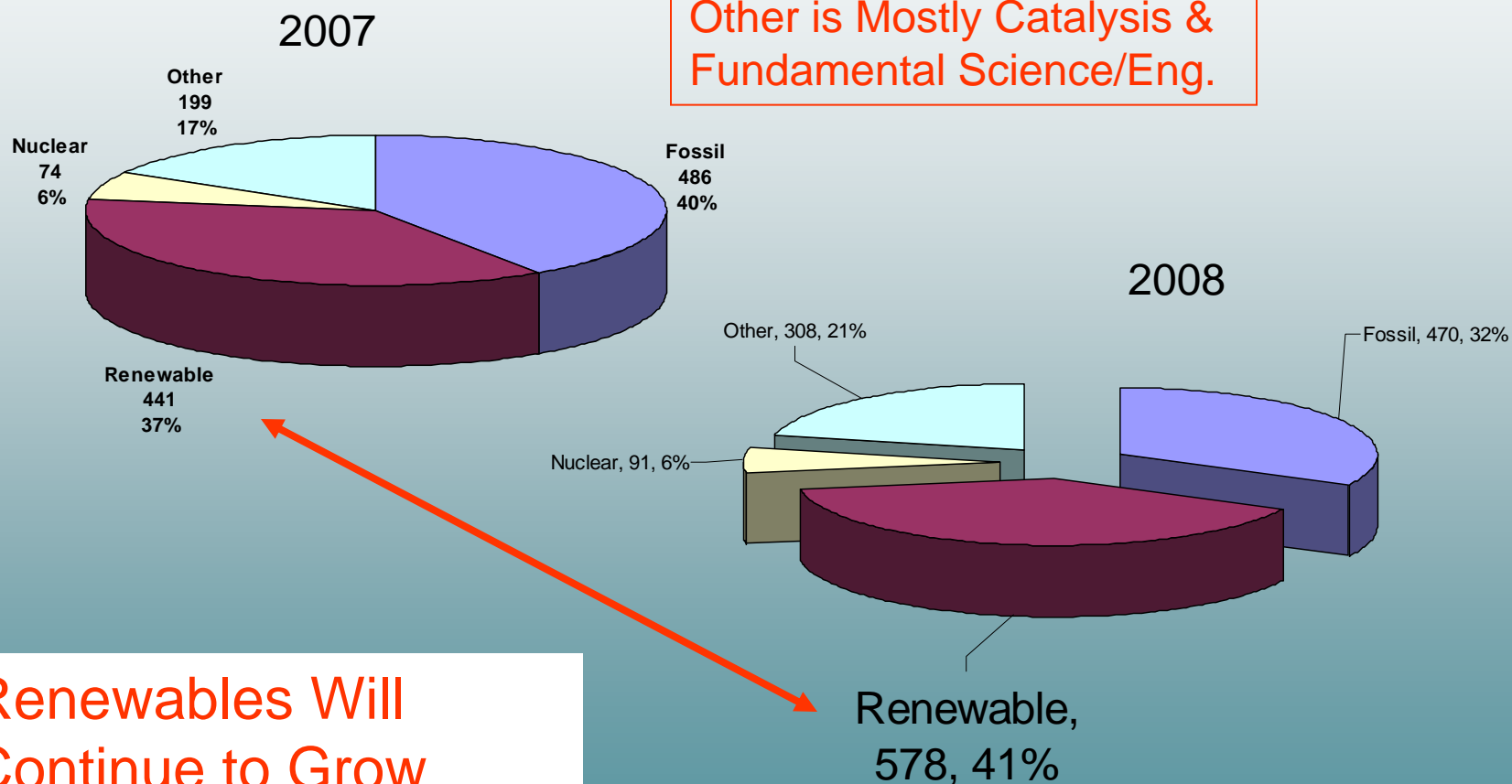
- Flat Federal R&D Spending
- Probably Represents Growth in Industry R&D
- Large Pharma & Other Research Participants
- Might Actually Decrease Next Year due to Global Economic Issues

Energy Related Papers, 1447, 28%

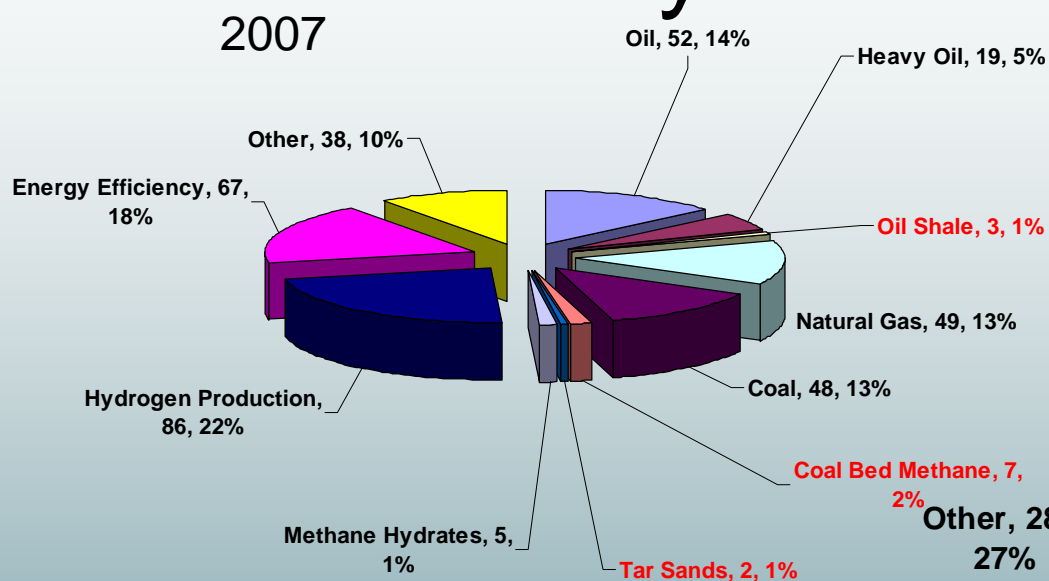


Year	Total	Energy
2007	4543	1200
2008	5219	1447
Growth%	15	21

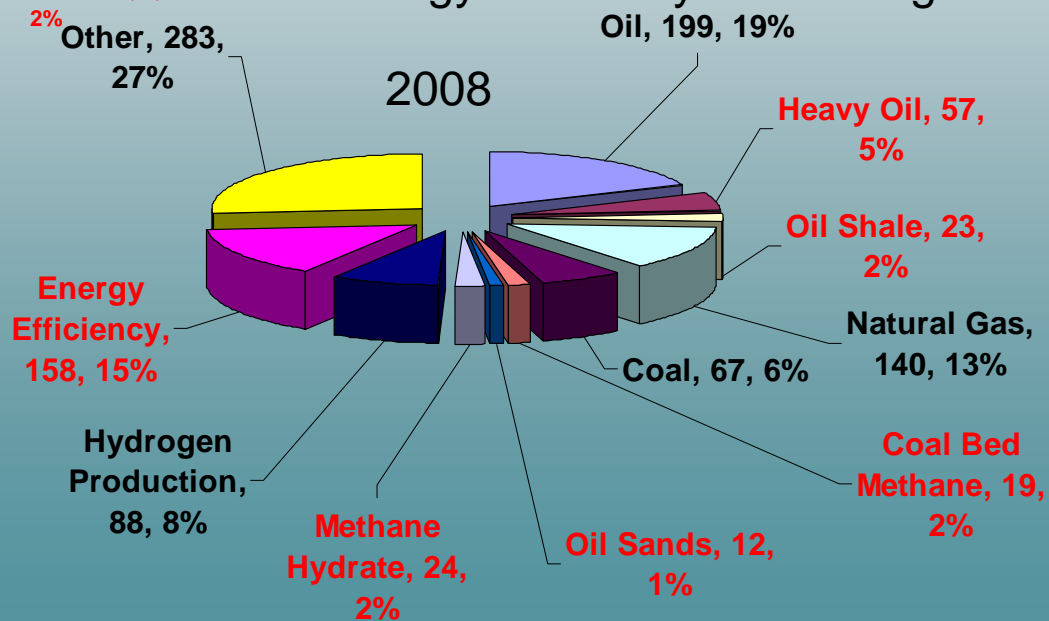
AICHE Energy Programming By Source



AICHE Fossil Energy Programming by Fuel Source



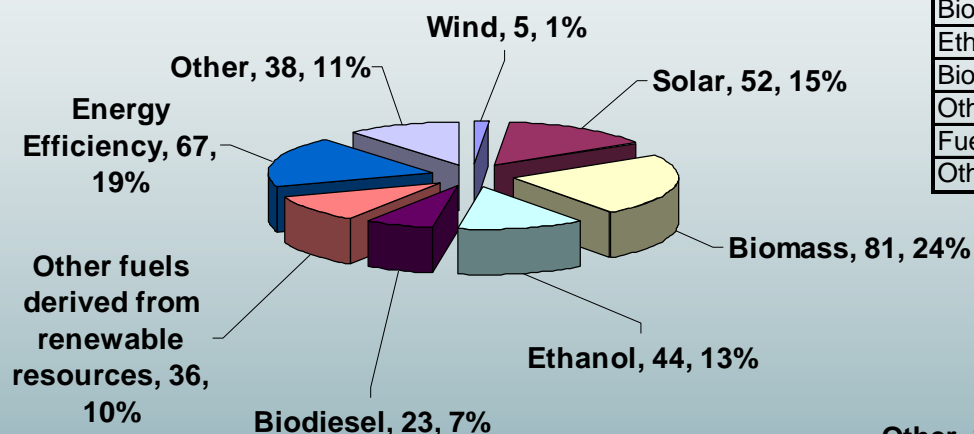
- Fossil Increased
- Hydrogen Programming is Flat
- Heavy Oil is Ripe for a New Topical
- Other Unconventional Rising
- Energy Efficiency is Growing



- Survey will be modified Next Year to Focus Results – Multiple Key Words will No Longer be available
- Authors Will Input Keywords if Other is Selected

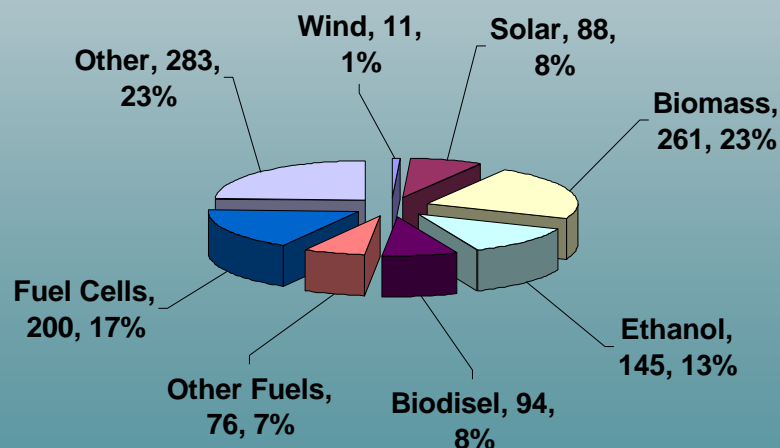
AICHE Renewable Energy Programming by Fuel Source

2007



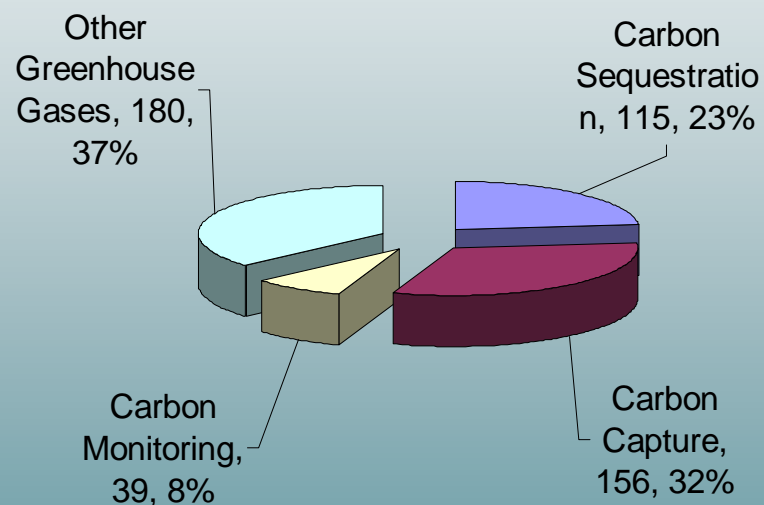
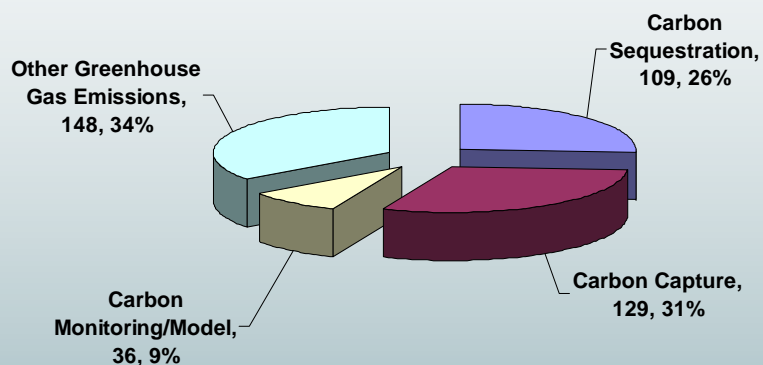
Renewable	2008	2007	Growth
Wind	11	5	120%
Solar	88	52	69%
Biomass	261	81	222%
Ethanol	145	44	230%
Biodiesel	94	23	309%
Other Fuels	76	36	111%
Fuel Cells	200	NA	NA
Other	283	38	645%

2008



- As Expected Biomass, Ethanol, Biodiesel Grew Substantially
- Solar Topical Planned for 2009 – May Need Help Getting Off the Ground

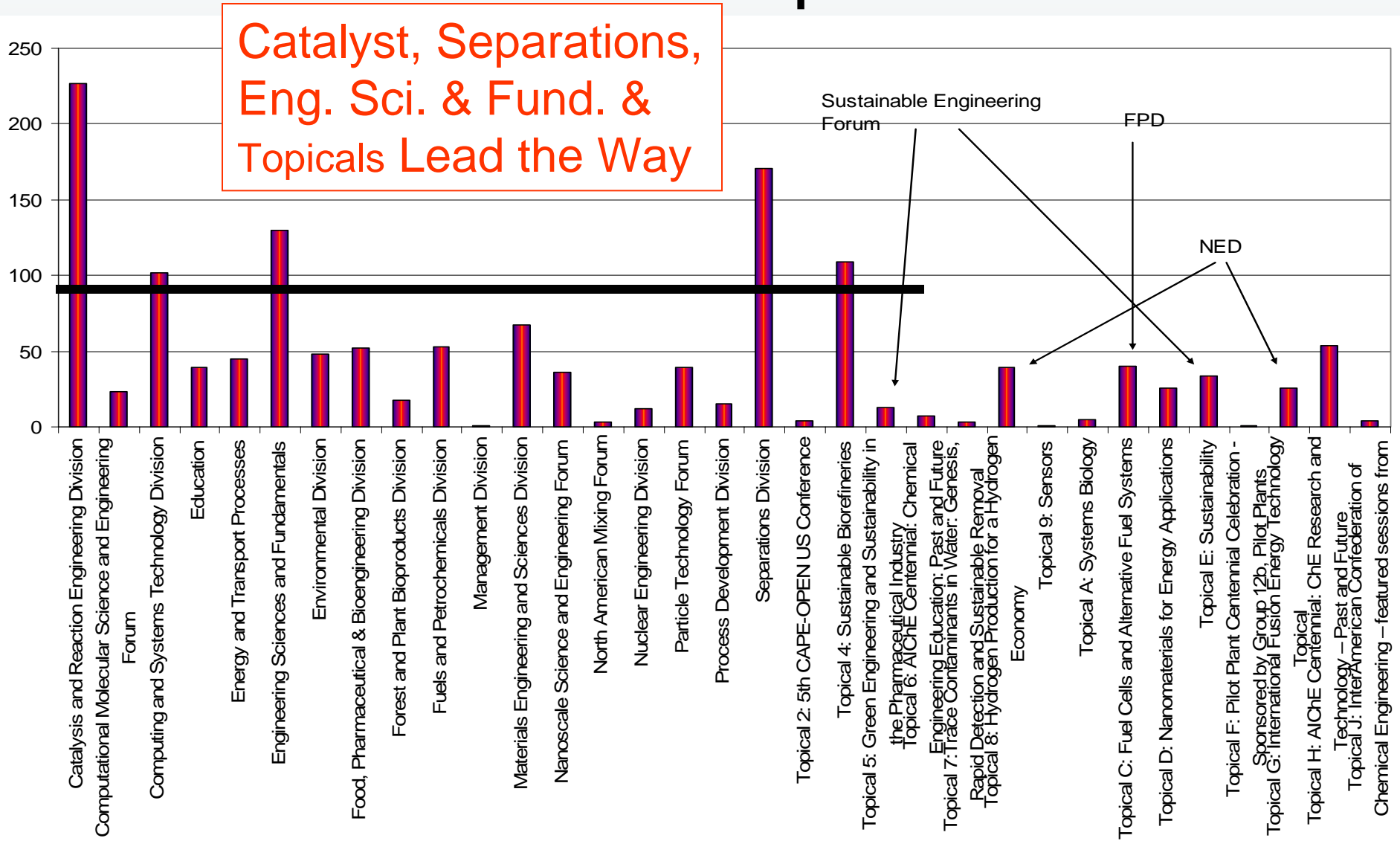
AICHE Climate Change Programming



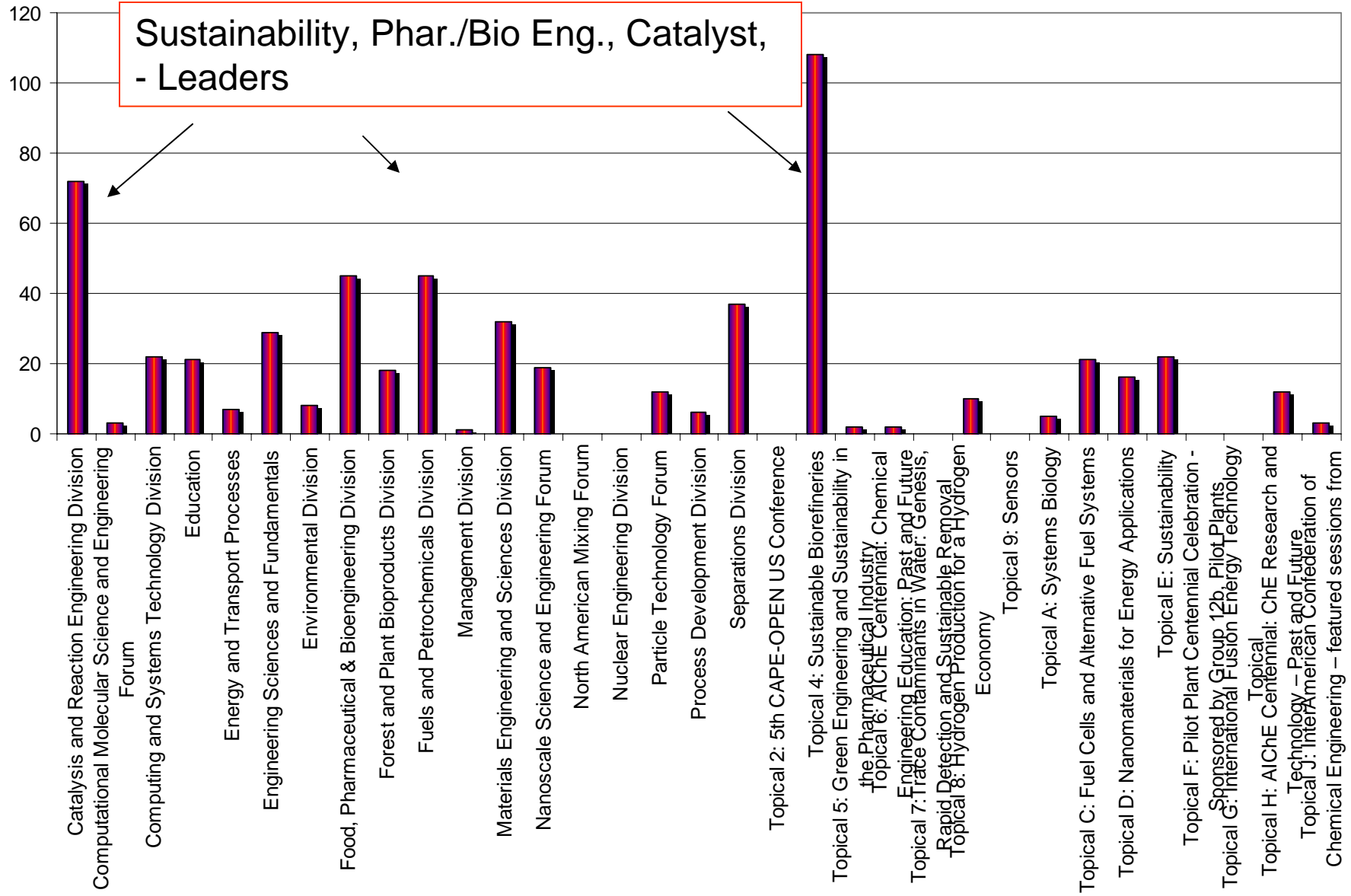
Survey will be Amended to Make Only One Keyword Selectable

Carbon is a Growth Area for AIChE Topicals Planned for 2009

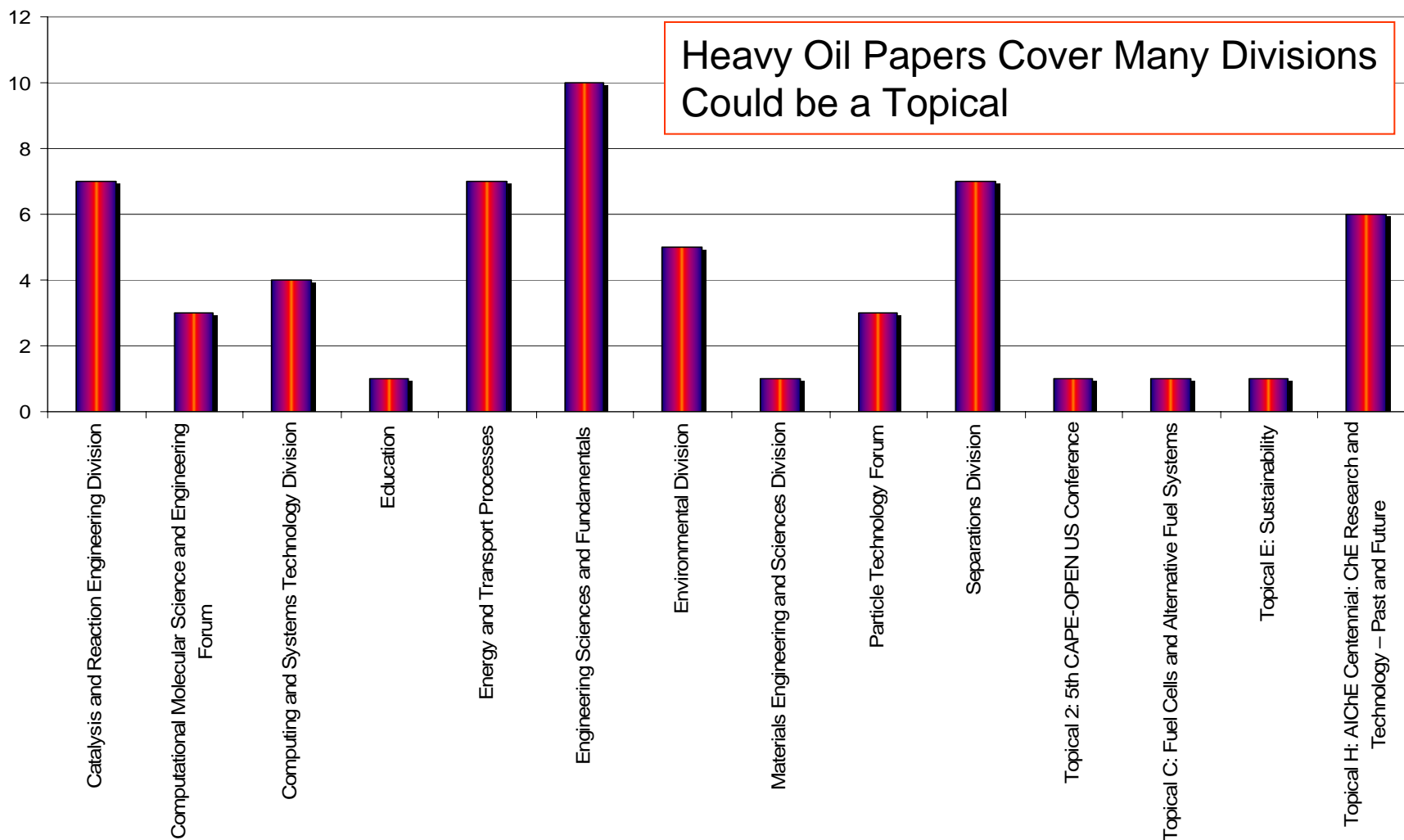
Energy Programming by Division/Topicals



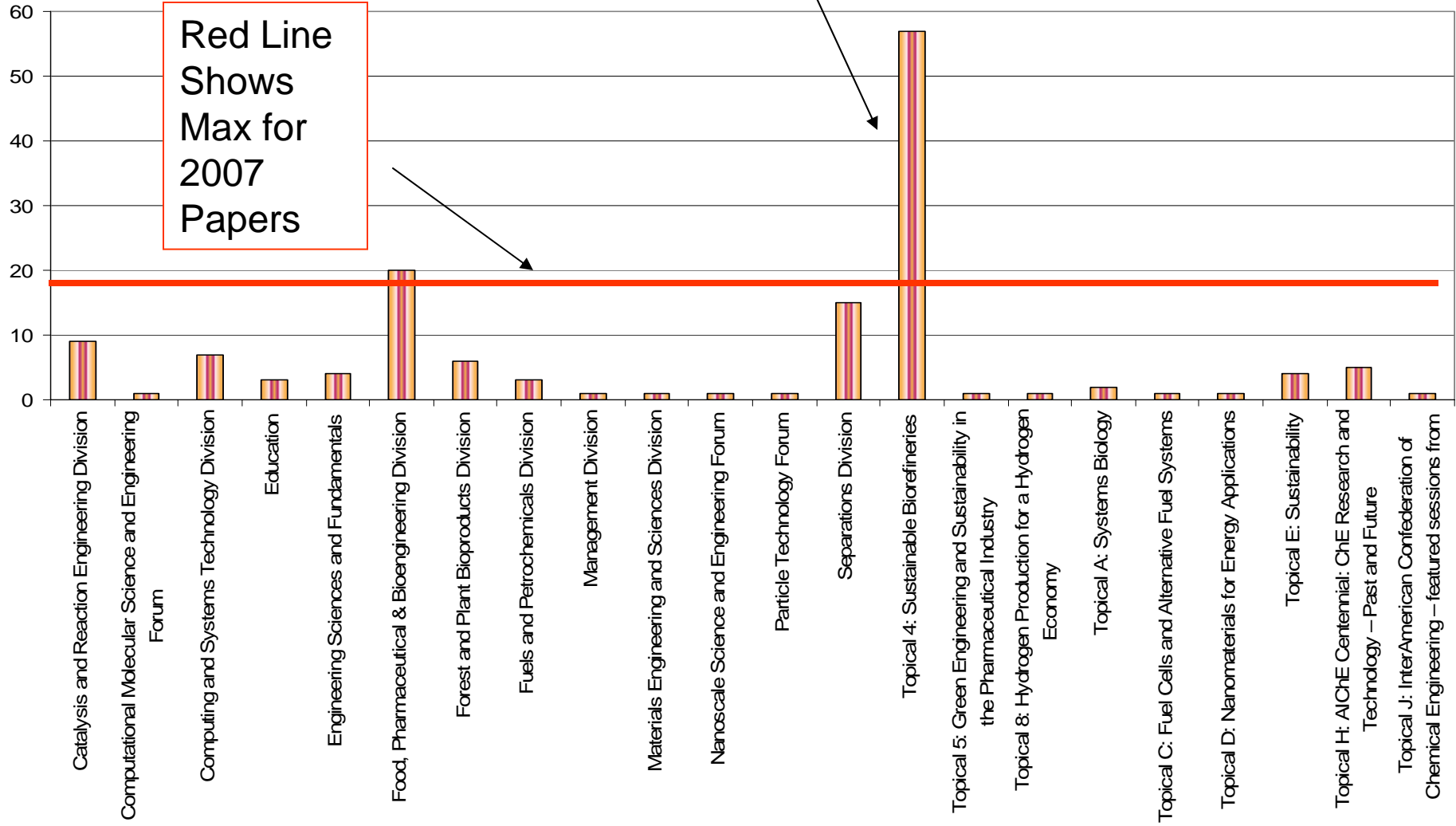
Renewable By Division/Topical



Unconventional Oil – Big Programming Growth



Ethanol, BioDiesel Programming Grew – Mostly in One Topical



Other Fuels/Chemicals from Renewable Sources

– Ripe Area for Programming Champion

100% Growth
from 2007 to
2008

Sum of Other fuels derived from renewable resources	
Division	Total
Catalysis and Reaction Engineering Division	9
Computational Molecular Science and Engineering Forum	0
Computing and Systems Technology Division	3
Education	3
Energy and Transport Processes	0
Engineering Sciences and Fundamentals	5
Environmental Division	2
Food, Pharmaceutical & Bioengineering Division	10
Fuels and Petrochemicals Division	5
Management Division	1
Materials Engineering and Sciences Division	2
Nanoscale Science and Engineering Forum	1
Particle Technology Forum	2
Process Development Division	2
Separations Division	7
Topical 2: 5th CAPE-OPEN US Conference	0
Topical 4: Sustainable Biorefineries	13
Topical 8: Hydrogen Production for a Hydrogen Economy	1
Topical A: Systems Biology	4
Topical D: Nanomaterials for Energy Applications	1
Topical E: Sustainability	3
Topical H: AIChE Centennial: ChE Research and Technology – Past and Future	2
Grand Total	76

Solar Topical Planned for 2009

Solar Papers By Division

Sum of Solar	
Division	Total
Catalysis and Reaction Engineering Division	5
Computational Molecular Science and Engineering Forum	1
Computing and Systems Technology Division	3
Education	6
Engineering Sciences and Fundamentals	8
Environmental Division	2
Materials Engineering and Sciences Division	9
Nanoscale Science and Engineering Forum	14
Particle Technology Forum	5
Process Development Division	2
Topical 6: AIChE Centennial: Chemical Engineering Education: Past and Future	1
Topical 7: Trace Contaminants in Water: Genesis, Rapid Detection and Sustainable Removal Processes	0
Topical 8: Hydrogen Production for a Hydrogen Economy	9
Topical C: Fuel Cells and Alternative Fuel Systems	1
Topical D: Nanomaterials for Energy Applications	12
Topical E: Sustainability	9
Topical H: AIChE Centennial: ChE Research and Technology – Past and Future	1
Grand Total	88

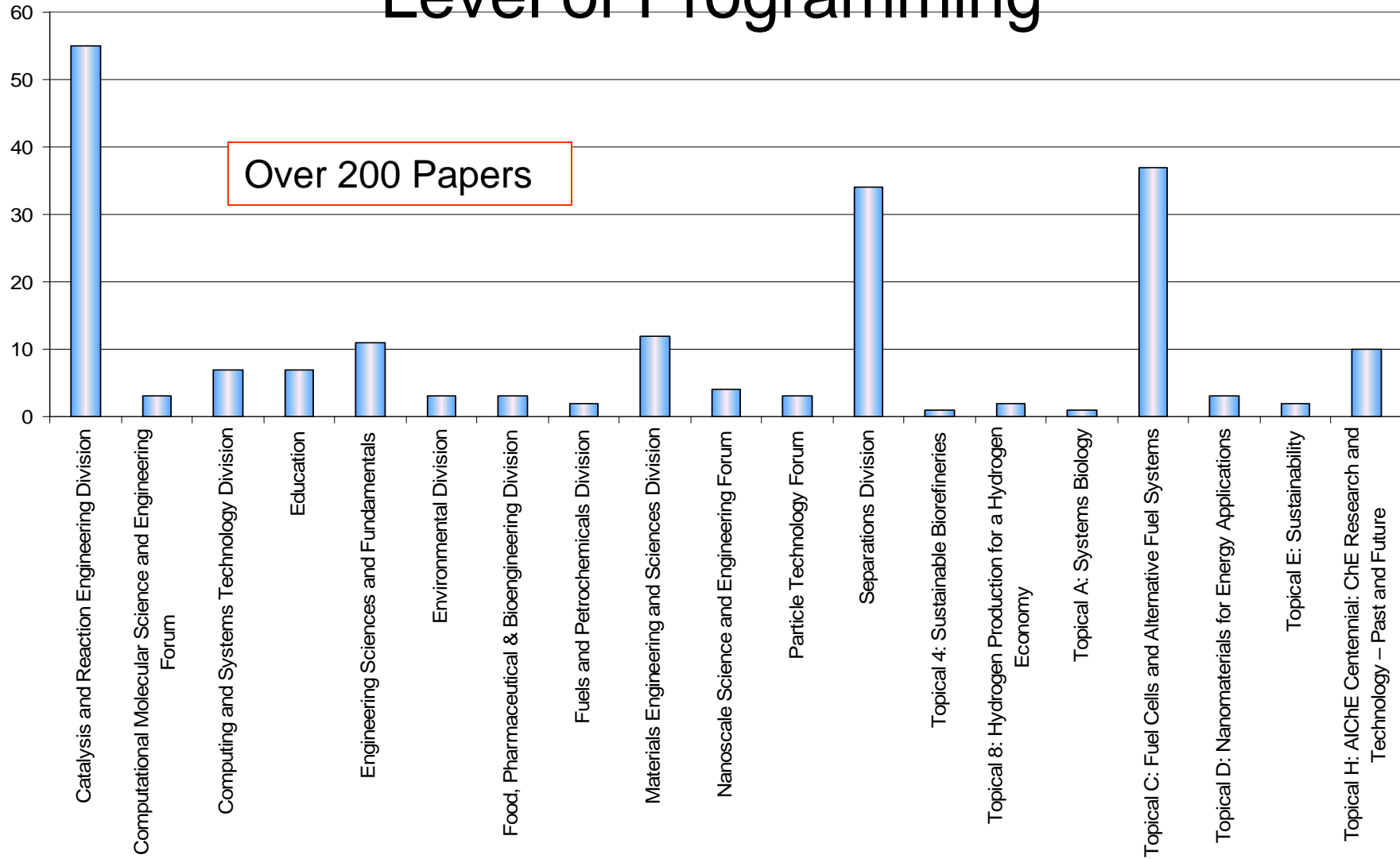
Energy Efficiency – Another Potential Area for a Focused Topical?

Sum of Energy Efficiency	
Division	Total
Catalysis and Reaction Engineering Division	24
Computational Molecular Science and Engineering Forum	2
Computing and Systems Technology Division	15
Education	4
Energy and Transport Processes	5
Engineering Sciences and Fundamentals	7
Environmental Division	5
Food, Pharmaceutical & Bioengineering Division	4
Forest and Plant Bioproducts Division	2
Fuels and Petrochemicals Division	1
Materials Engineering and Sciences Division	9
Nanoscale Science and Engineering Forum	2
Particle Technology Forum	3
Process Development Division	5
Separations Division	28
Topical 4: Sustainable Biorefineries	18
Topical 5: Green Engineering and Sustainability in the Pharmaceutical Industry	1
Topical 6: AIChE Centennial: Chemical Engineering Education: Past and Future	1
Topical 8: Hydrogen Production for a Hydrogen Economy	3
Topical C: Fuel Cells and Alternative Fuel Systems	2
Topical D: Nanomaterials for Energy Applications	2
Topical E: Sustainability	7
Topical H: AIChE Centennial: ChE Research and Technology – Past and Future	7
Topical J: InterAmerican Confederation of Chemical Engineering – featured sessions from 23rd IACChE Congress	1
Grand Total	158

Energy Efficiency By Division

Are Fuel Cells Losing Momentum? – No

Changes to the Survey Now Reflect True Level of Programming



Future Plans

- Article in CEP – Part 2 “What Are Chemicals Engineers doing about Energy
- More Member Reach out Activities - Email Distribution Lists – Focus on Weaker Programming Areas
 - Unconventional Oil?
 - Solar?
 - Biofuels – Coordinate with Existing Topicals?
- Update Survey to Reflect Lessons Learned During Analysis-Annual 09/Spring 09
- *Capture Energy Presentations*
- Coordinate with Existing AIChE Energy Advisory Team

Comments?

Comments & Opening For Working Session I

- Working Session I – Should AIChE Consider a Institutionalizing Energy? Perhaps as a technical Society or Should AIChE Energy Programming continue as is or some hybrid structure; Should RANTC continue to play a role in highlighting Energy programming? Or should this role be incorporated into existing efforts?
- Group 1 - Should AIChE Consider a Institutionalizing Energy?
- Group 2 - Should AIChE Energy Programming continue as is or some hybrid structure
- Both Groups: Should RANTC continue to play a role in highlighting Energy programming? Or should this role be incorporated into existing efforts?
- Expected Output: Pro/Cons of Each Group Forwarded to AIChE Energy Task Team

Working Session II

- What Should AIChE RANTC's New Technology Focus be for 2008/2009
- Working Group I – List New Technology Topics and Two Champions for RANTC to Pursue
- Working Group II – Define RANTC's Future Objectives for 2008/09?

“Energy Steward” - Promotes AICHE Missions/Objectives

How the “Energy Steward” Concept Maps to AICHE Goals

- the **Global Leader** of the chemical Engineering profession,
- the **Lifetime Center** for professional & personal growth, and security of chemical engineers,
- the **Foremost Catalyst** in applying chemical engineering expertise in meeting societal needs.

Short List of Mission Statements

- **advance the development and exchange of knowledge**
- **stimulate collaborative efforts among industry, universities, government, and professional societies**
- **encourage other engineering and scientific professionals to participate in AIChE activities;**
- **advocate public policy that embraces sound technical and economic information and that represents the interest of chemical engineers**
- **facilitate public understanding of technical issues**

Energy Covers All Aspects of AICHE Vision/Mission – But Volunteers Are Limited – Where Should we Focus Our Energies?

Additional & More Unified Energy Programming

- Highlight Energy Related Programming by All Divisions in Meeting Publications
- Coordinate Virtual Topical (e.g. Hydrogen, Coal covered by so Many Divisions- Single Topical Difficult) – *Need to Advertise All*
- Could Setup Confex to Sort Papers by Subject Area (e.g. Energy, Hydrogen, Energy Efficiency, Oil, Gas, Coal, Renewable).
- Programs Could (*Will*) be Printed Highlighting (Consider Color Highlighting) Subjects Areas in Energy

Facilitates Partnerships Amongst Divisions/Forums within AIChE who Are Interest in Energy Programming

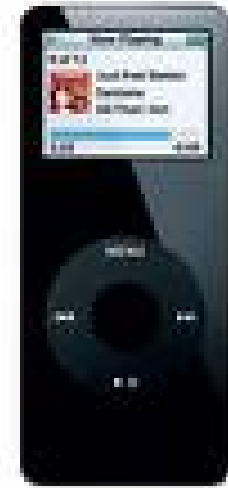
- Advertises Divisions/Forums Energy Related Sessions to Others –
- Keyword System in Confex Could help Identify Relevant and Related Sessions

Advertises & Seeks to Unite Divisions Through Publication of Energy Information

- Energy Related Papers Could be Identified by Keyword and Could be Sorted and Search for Easy Access
- Is AIChE Missing Publication Opportunity?
- Hundreds of Presentations on Hydrogen Alone were Presented at Last Annual Meeting
- Each Presentation Could be Captured by Keyword – Energy Related Papers could be sold as a group or single by downloading – Shouldn't we consider the IPOD Publication Model? – *Pay by the Song?*
- Ex. NED Captures and Posts all Presentations for Free – Web Site is becoming a resource for our industry

Further Initiatives

- Implement ***Capturing Presentations from Conference and Storing on Web*** – Make Energy Content Available to Members
- Continue to ***Refine Energy Survey/Virtual Topical Concept*** to Suit Members Needs
- New Item: Joined Energy Leadership Task Force Team – Task Team Member for National Programming Team
 - Develop ***Partnering Arrangements with other Energy Conferences***



IPOD Model – Buy Only Content that You Desire- Electronic PowerPoint Files Represent a Huge Resource of Information for Our Members

Continue to Work with Institute's Energy Task Force to Highlight and Promote Energy Related Programming

National Meeting Programming- AIChE Energy Team

Leadership Team (Karen Person Staff Support)	Task Team Participants	Operating Council Liaison	AIChE Staff
Andre Da Costa* Liese Dalbauman	Martin Abraham Bond Calloway	Jim Hill (CTOC)	Joe Cramer

National Meeting Programming

AICHE Energy Team

- Partnership with RANTC Energy Steward Initiative
- Objectives
 - Focus energy programming to be more effective
 - Facilitate partnerships among Divisions and Groups on energy; unite segmented activities
 - Enhance advertising, publicity, and participation (gatherings, virtual meetings, web communications)
- Actions
 - Energy survey / gaps analysis (Annual 07)
 - Collect programming content for web site
 - Virtual topical (Annual 08)
 - Establish web access to presentations (“IPOD model”)
 - Partner with other energy conferences

Further Discussion

- What else could we be doing to Highlight Energy Topics?