

FUELS 2015

A Strategic Plan for the Division of Fuel Chemistry

Introduction

This document represents a strategic plan for the Division of Fuel Chemistry for the period 2005–2015. It represents a modification, updating, and revision of the previous plan, *Fuels 2005*, which was prepared for the period 1995–2005.

The previous plan opened with the statement, “*As we approach the twenty-first century, the societal, technical, and political environment in which the American Chemical Society and the Division of Fuel Chemistry operate will continue to be subjected to an ever accelerating pace of change.*” With the benefit of hindsight, we can certainly recognize how valid that statement was in 1995 and succeeding years, and we must also recognize that it remains valid now that we have moved into the twenty-first century. As a result, many of the issues and concerns that affected the planning process for preparation of the previous plan are addressed as we look forward to the next ten-year period.

Mission Statement

The Division of Fuel Chemistry provides a forum for documentation and communication to the international community of research and development results concerning fuel research, and to promote efficient and environmentally acceptable fuel production and use.

Vision

As the year 2015 approaches, the Division of Fuel Chemistry will continue to be recognized as the leading source for information in the areas of fuel chemistry and technology, including issues related to fossil fuels (coal, crude oil, natural gas), alternative fuels (hydrogen, biomass, etc.), fuel processing technology (including fuel cells), and environmental issues of fuel production (such as CO₂ issues and particulate matter). Specifically:

- Our preprints and symposia will contribute to a strengthened and sound scientific basis for efficient and environmentally acceptable fuel production and use.
- Our symposia will draw a significant number of participants and publicity in the popular press and news.

- We will use highly effective electronic procedures for interdivisional and intradivisional communications and collaborations.
- We will promote public education and outreach in the area of fuel science.
- Our membership will expand to include representatives of most countries with interests in developing their fuel resources.

Values

The values of an organization represent the fundamental assumptions that underlie the philosophy of operation and decision-making. Values provide the motivation for achieving the vision of an organization. The Division of Fuel Chemistry has the following core values to guide us in fulfilling our vision:

Leadership in Fuel Science and Technology

- We have a commitment to relevance, accuracy, and timeliness in disseminating information regarding research and development in fuel science and technology, including relevant environmental issues.
- We are committed to promoting high quality in the pursuit and execution of fuel science and technology relevant to societal needs.
- We will anticipate the needs of the fuels research community and provide for those needs through our activities.
- We set the standard for timely and relevant information regarding research and development in fuel science and technology.

Environmental Responsibility

- We promote the responsible utilization of fuel resources; the processing, conversion, and utilization of fuels in environmentally acceptable ways; and the development of new fuels that may have reduced impact on the environment.

Honesty and Integrity

- We foster high scientific and ethical standards.
- We promote fiscal responsibility in administering the Division's business.

Objectivity

- We provide an open and unbiased forum for the presentation and discussion of scientific work in the area of fuel research.

Member Relations

- Our members are the heart of our organization.
- We treasure the scientific, cultural, and educational diversity of our membership, and membership is open to all without restriction.
- We encourage, appreciate, and recognize the efforts of our members toward making the Division a successful organization.
- We promote effective communication among members.

Public Education

- We are committed to providing value to the public by promoting awareness of the impact of fuel availability and utilization (including environmental issues) on all aspects of public life.
- We provide relevant information to researchers and the public so that informed decisions regarding fuels can be made.

External Factors

External factors will continue to affect the ability of the Division of Fuel Chemistry to meet its objectives. These factors can be categorized as follows: (1) environmental, (2) governmental, (3) industrial, (4) economic, (5) political, and (6) public awareness. The implications of each are briefly described below.

Environmental. The use of fossil fuels are expected to be subject to increasingly stringent environmental regulations over the next decade. In particular, the issue of global climate change will have a significant impact on the utilization of fossil fuels. It is likely that natural gas, hydrogen, fuel cells, and biofuels will be used increasingly in place of coal. There is an opportunity for the Division to become one of the leading forums for research on these issues. Any responsible and economically feasible policy must be supported by sound scientific research. We will take the lead in promoting this research and in disseminating the knowledge gained.

Governmental. A significant number of Division members depend on government funding to support their research. The amount of funding available for basic research in traditional fuel science areas has decreased over the last decade. However, research funding for hydrogen storage and production (including fuel cell science) is projected to grow in the next several years. In addition, the newly formed Department of Homeland Security is projected to supply funding for research projects related to fuel “independence”.

Industrial. The last decade has seen a continued decline in the commitment of industry to fund basic and applied research on fossil fuels, including conversion, refining, and utilization. However, opportunities in alternative strategies and technologies, such as fuel cells and rechargeable batteries, are likely to rise. Furthermore, certain economic factors cause the large number of small companies, who are not as well endowed as the mature, larger firms, to restrict funding at certain points. In times of growth and opportunity, however, the reverse is expected to occur.

Economic. With U.S. imports of oil at greater than 50% (57% in 2002), growing demand in developing countries, and political instability in certain oil-producing countries, readily available petroleum products at relatively low prices is prone to rapid change. It is unlikely that the coal industry itself will fund significant amounts of basic research, even if the U.S. government abandons its historical role as the main source of funding for coal research. One exception to this that may emerge in the coming years is government research funding for the development of environmentally sound methods for producing hydrogen from coal. In the U.S., there are increased economic and environmental incentives to switch to alternative fuels (such as natural gas, hydrogen, biofuels, etc.) for power generation due to the high costs of complying with environmental regulations for burning coal. The largest increases in coal use for the next decade will likely occur in Southeast Asia, including China. For this reason, the Division should increase its international outreach efforts into those regions in particular.

Political. Even though fossil fuels supply most of the nation's energy needs, they have a poor public image due to their association with negative environmental and human health effects, including acid rain, their perceived connection to global climate change, and mercury emissions. The only energy source with a worse public image than fossil fuels might be nuclear power. This poor image persists even within technically sophisticated audiences such as the American Chemical Society (ACS), which historically has not been an advocate for the Department of Energy (DOE) (even though DOE provides more funding for chemical scientists than the National Science Foundation). Efforts should be made by the Division to rehabilitate the image of fossil fuels inside the ACS, with the Congress, and with the Administration. It should be emphasized in these discussions that funding of energy research and development is an investment in our economic, environmental, and national security interests. At the same time, less resistance to alternative fuels and fuel technologies in the proper political climate can be expected, and efforts into their basic research should be pursued to the best advantage.

Public Awareness. Support for maintaining, let alone increasing, the present public funding for fuel research and development requires, among the voting and decision-making public, both an awareness of what fuel research entails along with an appreciation for its value to society both as a whole and to individual members of the "non-scientific" public. Many news reports, polls, and anecdotal stories suggest that the level of science knowledge and awareness among the general public is dismal. The Division must be actively involved in efforts to increase the public understanding, both of general science and technology issues and, of more parochial importance, issues regarding fuel research and technology.

Objectives, Strategies, and Measures

Objective I. Enhance and Diversify Programming.

A. *Strategies:*

One of the keys to the health of the Division is the perception held by the peer community within the Society as well as the scientific community at large. The quality of our symposia must be the state of the art and must consist of well-pertinent, organized programs. We must continue our successful practice in reaching out to other divisions within ACS to effectively link current Division activities with those of other divisions. A concerted effort must be made to achieve the following strategic goals:

- Continue to expand symposia to include new fuel sources. Emphasis on certain fuel sources will change periodically based on national and international market forces and political factors. Efforts must continue to be made to anticipate areas of future interest to the fuel chemistry community. A coherent approach must continue to be taken to sponsor, or jointly sponsor with other ACS divisions, symposia that avoid overlap or duplication.
- Hold regular series of symposia devoted to specific topics as pertinent and relevant to the research community at the time.
- Expand exposure of the symposia by, for example, inviting international participants. Efforts should be made to invite several well-recognized international scientists to participate in all symposia. Additional exposure can be achieved through use of the internet to promote symposium topics.
- Foster cross-divisional collaboration and explore synergies. For example, establish a regular series of joint symposia with other ACS divisions in areas that lie within mutual fields of interest.

B. *Measures:*

The following measures will be implemented to evaluate the effectiveness of the strategic elements of Objective I:

- Attention will be given to the attendance at each symposium, the number and regional distribution of foreign authors in the Preprints, and special attention will be given to identifying participation and attendance of members of other divisions (including the number of co-sponsored and cross-listed symposia). These data will be used in evaluating the success of the program symposia and the interest generated among the peer community. These relationships should perhaps be followed by the Program Chair and Membership Secretary.

- To assess the contributions made to the scientific community, use the Citation Index to track Division Preprint papers. An especially important factor to track is the movement of papers published in the Division Preprints into the peer-reviewed literature. This measure is best served under the responsibilities of the Program Secretary.
- Press releases relating to symposia will be collected and evaluated in terms of public impact of Division programs. This measure is best served under the responsibilities of the Public Policy Chair.
- A carefully designed survey mechanism should be incorporated in each symposium (including the general papers program) to gather data on value and impact of programmatic material and symposia to Division members and other ACS participants.

Objective II: Provide Improved Membership Recruitment, Retention, and Member Services.

A. Strategies:

The members are the heart of the Division. The Division must maintain mechanisms for continually improving recruitment and retention of members. In addition, the Division must establish a mechanism to evaluate membership needs and continually review the efficiency with which those services are provided.

- Continue to enhance electronic communication both among members and from the Division to members.
- Continue to provide a Glenn Award for the best paper presented at each technical meeting.
- Expanded membership through an expanded committee structure. Enthusiasm within any organization can be maintained through individual participation. The involvement of the membership at large is critical to the continued health of the Division. Provisions must be made to assure participation of the maximum number of Division members in planning and managing the affairs of the Division. This can be achieved through an expanded committee structure, through regular meetings of the various committees, and regular committee reports to the Division Executive Committee.
- Promote more social and/or technical interactions in order to improve member interaction, such as Sci/Mix and the divisional dinner. The fellowship of any organization is important and must be fostered. Such fellowship enhances the opportunities for interchange of information, ideas, and collaborative work. Adequate provisions for such social and/or technical exchanges should be a part of all national meetings.

B. Measures:

The following measures will be implemented to evaluate the effectiveness of the strategic elements of Objective II:

- Track number of new members. Identify and track the number of new members of the Division. Efforts must be made to identify the motivating factors for joining the Division and to monitor, by means of an annual survey, whether the professional needs of new members are being met by being a member of the Division.
- Track total membership. Attention must be given to existing members in the same fashion as that given to new members. An annual survey instrument is needed for all members that can be used for an annual self-evaluation of the effectiveness of the Division and its programs.
- Annual survey. An annual survey could be developed, distributed, and analyzed to optimize the services provided to members. Alternatively, an active and interactive Q&A page could be instituted on the website, with the records from this analyzed annually.
- Track number of members active on committees. A key indicator of the interest and commitment of members is their service on committees. An analysis of committee member participation will be a valuable metric of the service performed and interest level of members in Division activities.
- Note results of Outstanding Division Awardees. It is recognized that divisions that win this award have succeeded well at this strategic objective, since it is a key component in the evaluation for this award. Take note of which division has won and note what mechanisms were put in place to warrant the award.

Objective III: Maintain Fiscal Soundness.

A. Strategies:

Any organization must have a sound fiscal policy in place with which to manage and expend funds derived from its membership and related activities. The Division Executive Committee must assure that fiscally sound financial practices are followed. Therefore the Executive Committee shall implement the following strategic elements:

- Establish a Finance Committee and/or a Director of Development. A finance committee will be established and charged with the responsibility for preparing an annual budget. The budget will be based on sound estimates of income from member dues, Preprint subscriptions, and related income-producing activities and anticipated expenditures arising from legitimate, documented transactions.

- Fund raising. The Finance Committee or Director of Development will organize a program for solicitation of corporate gifts, as well as support from foundations and member donations or bequests.

B. Measures:

The following measures will be implemented by the Division Executive Committee to evaluate the effectiveness of the strategic elements of Objective III:

- Annual financial report. The annual financial report will be made to the Executive Committee clearly providing the source and status of income, expenses, and interest earned on invested funds.
- Results from Outstanding Division Award. The financial report from these winning divisions is closely examined in the evaluation process for this award.
- Amount of money obtained from fund-raising activities. The annual report will provide information on fund-raising activities to include contacts made, commitments made, potential sources of funds, and the nature of any directed giving.

Objective IV: Promote and Influence Public Policy and Education

A: Strategies:

The continued public and industrial support of science and engineering in the United States depends on the public's perception of the value of science and technology in today's world. From the end of the Second World War to the end of the Cold War, the level of public support was driven largely by national security issues. Security issues, albeit with a somewhat different focus, are still relevant in the "post-9/11" world. However, when these issues are coupled with domestic and economic considerations, the danger exists that short-term expediencies will replace longer-term considerations that will be of more value to our common good. The Division must do its part in providing timely and relevant information on science and engineering issues. The following strategic objectives should be implemented:

- Support the Public Outreach Committee. The purpose of this committee is to identify, within areas of relevance to the Division, interesting and important items that should be brought to the attention of the general public. The public outreach can take the form of news releases, letters to the editor, contacts with appropriate Congressional committee members or state legislators' offices, and other public statements that elaborate on the major topics of various symposia and other important scientific work carried out by Division members.
- Continue to develop opportunities to join with other divisions in promoting important energy issues within ACS. The Division Chair and Executive

Committee members must take the initiative in developing opportunities, through appropriate symposia and public outreach mechanisms, to raise the level of awareness of energy-related matters within the scientific community in general, and in other divisions of ACS.

- Create closer ties with ACS governance, divisions having similar interests, and local ACS sections. We need to better utilize services from the ACS and to make sure that our interests are represented.
- We can also look outside ACS, to, e.g., the AIChE and American Carbon Society for input into fuel-related issues and programming.
- Become involved in the ACS public education movement. The Division Executive Committee must become involved in the activities of the ACS public education initiatives. Efforts should be made to produce position papers and informative brochures that provide timely information on such topics as the impact of energy use on our economy, energy supply, alternative energy sources, environmental considerations of energy use, and realistic time frames for conversion from present energy-use patterns to alternative energy sources.
- Develop a network, such as a home page on the internet, to interact with teachers and students. The Public Outreach Committee should develop a home page that will serve as the basis for interaction with the public education community. The home page should contain timely information on energy, energy supply, and alternative energy sources that can be incorporated into both elementary and secondary education curricula. The home page should also serve as a resource to direct teachers or other interested parties to other sites on the web.
- Some of these initiatives may best be addressed by funding from outside sources, such as educational grants from various foundations. Such initiatives are best pursued by a Finance Committee or a Director of Development.

B. Measures:

The following measures will be implemented to evaluate the effectiveness of strategic elements of Objective IV:

- Annual member survey. The Public Outreach Committee will either develop questions for the survey instrument to be used annually to assess the Division members' public awareness of the Division and Division-related matters, or analyze website Q&A results. The results will be evaluated annually by the Division Executive Committee.
- Select key members to monitor this objective. The Division Executive Committee will select a core group of members to monitor and provide a brief annual report on progress being made on the promotion and influence of public policy and education. The results of these reports will be evaluated annually by the Division Executive Committee to assess the effectiveness of the efforts of the Public Outreach Committee.

Objective V: Improve the worldwide recognition of the Division.

A: Strategies

The Division of Fuel Chemistry is a world-renowned professional society dealing comprehensively with fuel- and energy-related activities. Since the scope of the Division reaches a worldwide community, communication within this community is vital. To more effectively capitalize on the international interests that exist, the Division Executive Committee should take steps to implement the following strategies:

- Establish a committee of foreign members. This committee would assure that the needs of foreign members are being met.
- Continue to organize symposia with special worldwide interest and participation. Sponsorship of such symposia can be increased by inviting well-recognized international scientists to participate in all symposia and joint symposia. Opportunities should be sought for co-sponsoring symposia with other international professional societies.
- Symposia published in international journals. International symposia should be organized in such a way that papers selected for presentation could also be reviewed for inclusion in special issues of journals that have a broad international audience, such as *Energy and Fuels*, *Fuel*, *Carbon*, and *Fuel Processing Technology* for fossil fuels; *Applied Catalysis and Journal of Catalysis*; *International Journal of Hydrogen Energy*, *Journal of the Electrochemical Society* and *Journal of Power Sources* for hydrogen-related work; and *Environmental Science & Technology* and *Analytical Chemistry*. These examples are not exhaustive and are expected to change with time.
- Co-sponsor international symposia. Opportunities should be sought to co-sponsor symposia in conjunction with other international professional meetings such as the International Conference on Coal Science, the Pittsburgh Coal Conference, the Gordon Research Conference on Hydrocarbon Resources, and the North American Catalysis Society Meetings. These examples are not exhaustive and are expected to change with time.
- The Division will strive to continue to provide the prestigious Storch Award in Fuel Chemistry.

B. Measures:

The following measures will be implemented by the Division Executive Committee to evaluate the effectiveness of the strategic elements of Objective V:

- Annual survey. The annual survey to be developed will include parameters to assess the interest, needs, and possibilities of organizing international symposia,

as well as the success of prior international symposia. Alternatively, results from the website Q&A section will be evaluated annually for this measure.

- Number of connections to the worldwide web home page. The number of queries should be tallied annually and an analysis of the point of origin of such queries should be made.
- Number of international members, symposia speakers, and subscriptions to preprints. An annual review will be made of the participation of international researchers in symposia and Division programs. Data will be gathered and reported annually on the number of preprint subscriptions originating from foreign researchers and libraries.