An Organizational Structure for the Future

by Mark Cesa, Ito Chao, Michael Droescher, Lori Ferrins, Zhigang Shuai, and Javier Garcia-Martinez

On 4 June 2022 the National Adhering Organizations (NAOs) of IUPAC will make a critically important decision that will have a great impact on IUPAC's role in the chemistry enterprise in the coming years. A new organizational structure has been proposed for IUPAC that is intended to position the Union favorably for its unique role in the rapidly evolving world of 21st century science. In this article the work of the IUPAC Organizational Structure Review Group is summarized, and the Group's major recommendations are presented. Deliberations by the IUPAC Bureau and Executive Committee, in collaboration with the NAOs, have led to a series of proposed changes to the IUPAC Statutes, Bylaws and Standing Orders, building upon the Review Group's principal recommendations. It is these substantive changes that the NAOs will decide upon in June this year.

The Tasks of the Review Group

The IUPAC Organizational Structure Review Group was established with Council approval in 2019 to "undertake a complete review of the organizational structure of IUPAC" and to "develop proposals for the future organization of IUPAC" [*Chem. Int.,* vol 42, no. 2, 2020, p. 22; https:// doi.org/10.1515/ci-2020-2025]. The Review Group began its work in 2020 [https://www.iupac.org/project/2020-007-1-020], and included the following members: Dr. Mark Cesa (USA, Chair, 2014-2015 President of IUPAC), Prof. Ito Chao (China/Taipei), Prof. Dr. Michael Droescher (Germany), Prof. Lori Ferrins (Australia, IYCN), Prof. Zhigang Shuai (China/Beijing), and Prof. Javier Garcia Martinez (Spain, IUPAC 2020-2021 Vice President, *ex-officio*). Building on the 2016 IUPAC Strategic Plan [https://iupac.org/who-we-are/strategic-plan/], the Review Group's major tasks were to recommend:

- directions for the scientific work of the Union going forward, and how to structure the Union to achieve its scientific objectives; and
- ways of working that would reduce costs and improve efficiency.

Over several months in 2020, the Review Group gathered information through a survey of IUPAC stakeholders and interviews with Secretariat staff and volunteers, and carried out a review of emerging trends in the chemical sciences.

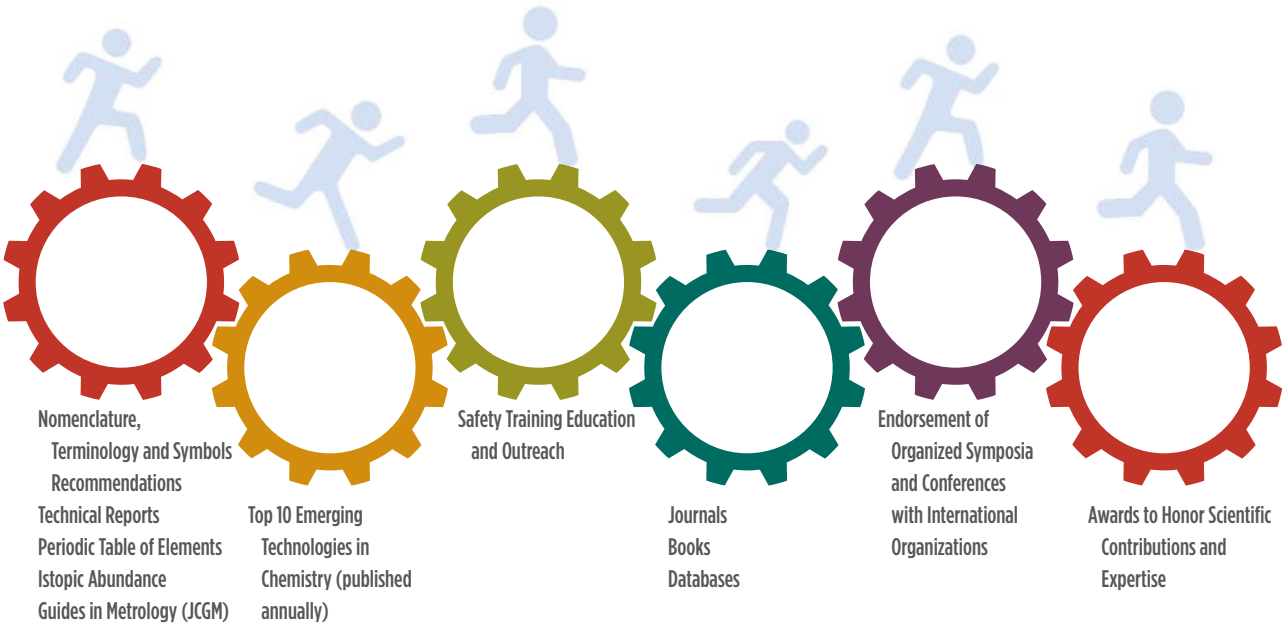
The **stakeholder survey** is the subject of a recent article in *Chemistry International* [*Chem. Int.,* vol. 43, no. 2, 2021, pp. 36-39; https://doi.org/10.1515/ci-2021-0213]. The responses to the survey were revealing, with several common threads. Respondents suggested that IUPAC should:

- be more responsive, adjusting priorities in response to the rapidly changing scientific environment and culture;
- remain focused on the core activities of IUPAC but include an emphasis on emerging areas in the chemical sciences;
- embrace technology in the day-to-day operation of the Union;
- promote social equity and diversity in the chemistry community;
- increase the visibility of the Union such that we can recruit top chemists to contribute to the activities of the Union;
- be more communicative in all facets of IUPAC's business, and increase communication with NAOs, Associate Organizations, and members.

Interviews and discussions with Secretariat staff and volunteers were productive, and they were largely consistent with the findings from the stakeholder survey.

Our examination of emerging trends and topics in research in the chemical sciences indicated that the field of chemistry is moving forward rapidly across all areas. It particularly showed the increasing importance of chemistry as a collaborative partner with physical, biological and social sciences, engineering and technology, and social sciences to address world needs; see IUPAC's annual recognition of Top Ten Chemical Technologies (https://iupac.org/what-we-do/top-ten/). Additionally, the December 2021 issue of *Pure and Applied Chemistry* focuses on Emerging Technologies and New Directions in Chemistry Research (https://www.degruyter.com/journal/key/pac/93/12/html). These findings underscore the value of an enhanced emphasis on science in the structure of IUPAC, particularly to encourage forward thinking and collaboration, as an integral part of the work of the Union.

IUPAC'S Scientific Activities



IUPAC's activities span a wide range and contribute to the advancement of chemistry around the world in many ways.

Review Group Recommendations

The Review Group took into account information from the stakeholder survey, interviews, and examination of emerging trends in chemistry, as well as the recommendations in a report from the Finance Committee Options Work Group. With this information, the Review Group prepared a report for the IUPAC Bureau that included a series of recommendations for improved operations and communications with stakeholders; for enhanced offerings to NAOs, industry and individual affiliates; and for the governance structure of IUPAC. Many recommendations in the Review Group report regarding operations and communications with stakeholders were already under way, and others have been implemented. However, the most far-reaching and potentially impactful recommendations dealt with the organizational structure of the Union itself.

Leadership Boards

Perhaps the most important finding from the Review Group's work was the increasing need for IUPAC to respond more effectively to the rapid changes and growth in the chemical sciences, to meet global challenges in our more interconnected and digitalized world. The Review Group saw a need for a structure for IUPAC that emphasized its roles in the chemical enterprise at the highest level.

The review group therefore recommended replacing the current Bureau-Executive Committee structure with two Governance Boards that cover administrative matters and science: an Executive Board and a Science Board.

Executive Board (EB): This Board would be responsible for decisions and execution of the administrative matters of the Union. This Board would oversee adherence to the IUPAC Statutes and Bylaws and ensure IUPAC's administrative and financial operations; work with the Science Board; and implement the decisions of the Council and, with the Science Board, the programs of the Union as directed by Council.

Science Board (SB): This Board would be responsible for the scientific direction, activities, and contributions of the Union. The Science Board would set the scientific priorities and strategic vision of IUPAC; facilitate collaboration among the Divisions and Standing Committees; oversee and review the work of Divisions and Standing Committees regarding projects, conferences, and publications; work with the Executive Board; and liaise with external organizations on scientific matters; all within the directions of the Council.

The Review Group believes that the proposed governance structure emphasizes the science while maintaining effective oversight of the administrative matters of the Union.

New Forums and Committees

In addition, the Review Group recommended the following new Forums for communication and interaction with IUPAC's stakeholders.

NAO Forum: This Forum would be a yearly electronic meeting with representatives of each Adhering Organizations, to provide an opportunity for them to discuss matters of interest with IUPAC leadership, such as mutual activities among the NAOs, emerging issues facing the Union, and other similar matters.

Presidents Forum: This Forum would take the shape of an annual meeting (online in off-years and in-person in General Assembly years) with the leaders of global chemical societies. This Forum will provide a strategic opportunity for IUPAC to exercise its convening role in global chemistry to lead and coordinate international initiatives.

New Standing Committees on Diversity, Equity and Inclusion and on Ethics were proposed by the Review Group to ensure that the tenets of the Strategic Plan regarding these matters were practiced in all aspects of IUPAC's work. The Bureau decided to combine these two proposed committees into a Committee on Ethics, Diversity, Equity and Inclusion (CEDEI). Finally, the Finance Committee Options Work Group report called for establishment of a Centenary Endowment Board.

Developing and Refining the Recommendations

Soon after the Review Group's report was submitted to the Bureau, the Executive Committee endorsed recommendations regarding the Executive Board and Science Board. The Bureau then organized a series of virtual meetings with members of the Review Group to discuss the recommendations. Following these meetings, a series of Engagement Sessions were organized virtually for NAO representatives to become familiar with the recommendations and to suggest changes and improvements. In particular, these discussions led to the following detailed descriptions, prepared by the Bureau, of how the Executive Board and Science Board members would be selected.

The Executive Board would consist of the President, as Chair, the Vice-President, the Secretary-General, the Treasurer, the Past-President, the Executive Director (*ex-officio* non-voting), and six other Elected Members chosen by the Council. Elected Members would serve two-year terms and would be eligible for re-election for one additional term. Division Presidents would not be eligible for service as Elected Members of the Executive Board, and no NAO would have more than one Elected Member on the Board.

The Science Board would consist of the Vice-President, as Chair, the President and the Secretary-General *ex officio,* the Executive Director (*ex officio* non-voting), five members from among the Division Presidents and Standing Committee Chairs and elected by them, and up to five additional Elected Members from the scientific community at large, chosen by the Council. The period of service of the Elected Members would be two years, and they would be eligible for re-election for a second two-year term.

At the General Assembly in 2021, the Council was invited to suggest modifications of the recommendations on the proposed structural changes, principally the replacement of the Executive Committee and Bureau with an Executive Board and Science Board. Council also voted in favor of establishing the Committee on Ethics, Diversity, Equity and Inclusion (CEDEI) and the Centenary Endowment Board (CEB).

The Bureau was asked by Council to propose modifications to the Statutes, Bylaws, and Standing Orders consistent with their recommendations for Council consideration. The proposed revised Statutes, Bylaws and Standing Orders were approved unanimously by the Executive Committee on 6 November 2021. The Bureau, at a meeting including current and incoming members, proposed small changes to clarify the text. These Statutes, Bylaws and Standing Orders were endorsed by the Bureau on 29 November 2021 and sent to the Secretary General with a request to hold a special meeting of Council to consider them. According to the rules for such matters, this Council meeting would be scheduled as soon as possible after a six-month period. The special meeting of Council will be held on 4 June 2022.

Next steps

IUPAC's stakeholders now have a new opportunity to come together to empower IUPAC to move forward meaningfully in the coming decades. This new proposed organizational structure will enable IUPAC to function even more effectively. With the establishment of the Science Board, the new structure would give a strong voice to science in the Union, enable and encourage inderdisciplinarity, and foster collaborations both within the Union's volunteer base and with other global scientific organizations. The Executive Board

would provide a strong mechanism for management and oversight of the operations of IUPAC.

The new organizational structure would improve communications with stakeholders through participation by the NAOs in selecting members of the Executive and Science Boards and through the NAO Forum, giving an greater voice to all NAOs. Participation, cooperation, and collaboration among NAOs, industry, younger scientists, and underrepresented groups would be further encouraged. The proposed structure would further encourage outreach to national and international organizations with complementary interests and mandates, enhancing IUPAC's stature in the global community.

Finally, the new structure would provide an opportunity for a fresh look at IUPAC's Divisions and Standing Committees. The Review Group recommended that the Divisions and Standing Committees form a working group to review the Division and Standing Committee structure in the light of the current state and future expectations of the field of the chemical sciences and recommend changes to the structure as needed.

IUPAC leadership strongly supports the recommendations made by the Review Group and the proposed changes to the Statutes, Bylaws and Standing Orders that will be considered by Council in June 2022. We as IUPAC's volunteers look forward eagerly to meeting the challenges facing the world in the coming years, and we expect that the new organizational structure will enable IUPAC to cement its leadership role in the chemistry community and the broader scientific community. We are confident that the new structure will foster new initiatives and growth, adhering to the IUPAC Mission Statement: "IUPAC is the global organization that provides objective scientific expertise and develops the essential tools for the application and communication of chemical knowledge for the benefit of humankind and the world."

Acknowledgments

We are grateful to Prof. Christopher Brett for his helpful comments on a draft of this article.

For updates about the coming meeting of the Council, 4 June 2022, see https://iupac.org/event/special-council-june2022/

For more information and comments, contact Task Group Chair Mark Cesa <markcesa@comcast.net> | https://iupac.org/project/2020-007-1-020

Call for Proposals

Any individual or group can submit a project proposal to IUPAC, with or without current affiliation with an IUPAC body. Projects can be submitted at any time. For detailed information, see the Guidelines for Completion of the Project Submission Form. Frequently Asked Questions on Project Submission and Approval Process are also available on the Union's website at www.iupac.org/projects. The proposal template is straightforward and is arranged so that it presents "up front" the project's intended impact (purpose), the intended stakeholders and beneficiaries, the dissemination plan, and how the effectiveness of that plan can be evaluated. More recently, specific guidelines have been added for the management of scientific data and digital outputs.

The revised form and guidelines are available at https://iupac.org/projects/project-submission-form-and-guidelines/

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