

MEMORANDUM

10 June 2007

To: Professor Bryan Henry, President IUPAC

From: Ron Weir, Chair, Evaluation Committee

EVALUATION COMMITTEE REPORT TO IUPAC COUNCIL: TORINO GA

1. The Evaluation Committee (EvC) has completed its study as outlined in the plan communicated to the Bureau in Madrid (Oct 2006) and as presented in the full report to the Bureau here in Torino (Aug 2007). This memorandum to the IUPAC Council is an abbreviated summary of that full report without the Annexes and Tables. Extensive consultation and searching were done to provide an exhaustive background on which to base the statistics from which conclusions may be drawn. These background documents include thousands of journal references, the internal IUPAC report of Schneider to the Ottawa GA (summer 2003), the IUPAC colour books (Red for Inorganic, Blue - Organic, Gold - Chemical Terminology, Purple - Macromolecules, Orange - Analytical, White - Biochemical, Silver - Clinical Laboratory Science, Green - Units and Symbols), and the report by Bull and Valter (June 2006, PAC), as well as consultation with Task Group Chairs and others inside and outside IUPAC.
2. Our evaluation has been confined to the 26 completed reports tabled at the GA in Beijing (summer 2005) and confirmed for study at the Madrid meeting (Oct 2006). These 26 represent a convenient, although arbitrary, window on the project system and among these 26 are two projects that have risen from the ashes as ongoing, quite spectacular, projects. The EvC has assessed these 26 projects against the IUPAC Strategic Plan and conclude that *all meet the criteria set out in the Strategic Plan, a result that verifies the process by which these projects were approved at the outset.*
3. The 26 projects were categorised by the EvC as follows with the total number of citations as 4,076 up to May 07 shown in the square brackets: Recommendations 1 [4 citations], Technical Reports 5 [119], Policy/Strategic 5 [31], Nomenclature 1 [Colour books], Reference Data 6 [3,921 + 6,500 database hits per week], Books 3 [0], Courses 5 [1]. These projects have involved 132 voluntary scientists and engineers, who are from 76 countries. The average time to completion is 2.8 years per project with two ongoing projects as described below. The average IUPAC funding support is \$4,400.
4. The work by the EvC has led to the following observations: (a) *the use of citations is an accurate measure of impact for some projects, but not for some other projects;* (b) *low profile projects characterised by a lack of citations may have high value via (i) their impact on nomenclature, terminology, units, as these documents are used throughout university instruction, scientific journal standards, often translated into other languages, and some have CD ROMs issued for sale, (ii) their impact on the scientific development of young scientists;* (c) *there is anecdotal information on the positive value of the conferences (projects), but quantitative data are lacking.*
5. To help the Council and Bureau further to assess the benefits of their investment, the EvC has selected two 'high profile' and two 'low profile' projects for more specific comment.

a. High Profile Projects

1999-037-2-100, Evaluated kinetic data for atmospheric chemistry.
 REFERENCE DATABASE. IUPAC investment = \$30k.

This reference database is accessed on the WEB site of Cambridge University (<http://www.iupac-kinetic.ch.cam.ac.uk>) and on the mirror site of IUPAC in North Carolina. The WEB site is attracting 6,500 connexions per week and over 370 subscriptions to the WEB mailing list for announcements. The 13+ peer-reviewed publications to date have drawn 3,570 citations with an increased number anticipated as the most recent manuscripts are read by the atmospheric community. New data are

continually added to the WEB database that allows for a near continuous update of the evaluation. The data are used by the atmospheric modellers to predict the effects of atmospheric change on climate that result in publications such as the United Nations Report of Climate Change. Proceedings at the United Nations indicate that the results of this project are influencing governments on their environmental policies.

2000-026-1-100, Critical compilation of vapour liquid critical properties.

REFERENCE DATA. IUPAC investment = \$2k.

The milestones to publish the seven papers with the reference data have been met and the passage of time is permitting an assessment to be made of their impact as the data are used within industry, education and the research community. A total of 308 citations is on record and the number increases steadily.

b. Low Profile Projects

2002-027-1-400, 11th Annual Course on Polymer Characterisation & POLYCHAR-11 World Forum on Polymer Applications and Theory.

COURSE. IUPAC investment = \$4.5k.

The following points address the effects of this Short Course, but the impact of any COURSE is difficult to measure as education is something consumed.

- (i). Up-to-date knowledge was gained by students and by experienced researchers from university and industry on recent techniques of polymer characterisation that has had a major impact on their education (120 registered participants from 41 different countries).
- (ii). The proliferation of knowledge was substantial in particular among participants from developing countries.
- (iii). The IUPAC financial support led to free course material for the students and a waiver of their fees as far as possible.
- (iv). Parallel sessions were not conducted.
- (v). The success led to the decision to conduct an annual Short Course in various venues around the world.

2002-018-1-300, Green Chemistry in Africa (book for university students with a focus in Africa).

BOOK. IUPAC investment = \$4k.

The following points that address the effects of this project.

- (i). The book was presented on 29 Aug 02 at the *World Summit on Sustainable Development* (Johannesburg 26 Aug to 4 Sep 02). The event attracted several delegates who participated in the *Science Forum* running in parallel to the World Summit.
- (ii). The book was reviewed in *The Medical Geology Newsletter* (by Professor T.C. Davies); in the *African Journal of Research in Mathematics, Science and Technology Education*; in the *International Journal of Biochemphysics* (by Professor G. Kamau in Kenya); in the *South African Journal Science*; in the website of the University of York (by Professor J. Clark).
- (iii). Substantial E-mail feedback was received by Professor Mammino (TGC). The following is a quote from the message by Professor K. Prah in Cape Town '*I think it is a wonderful bit of work and carries a brilliant idea which needs to be broadcast as widely as possible. Indeed, I think the need to broadcast the idea is most crucial. I for one had no idea about the concept of 'green chemistry'. It makes a great deal of sense*'. Professor Prah then recommended that the book be '*propagated and fed into schools and universities*'.

6. In the view of the EvC, the outcomes are significant. All 26 projects have had important influence and the IUPAC investment has been very modest. The high profile projects are more easily quantified, but for the low profiles projects quantitative indices are more difficult to devise as a measure of effectiveness.

7. Among the other lessons learned by the EvC as a result of this detailed study are (i) *the modest IUPAC investment in these 26 projects has demonstrated the success of the project system*, (ii) *a lack of specific information on file about the CONFERENCES*. The EvC has asked the Secretariat to start gathering statistics to help assess sponsorship of conferences by IUPAC. Fabienne Meyers has started this task. Among the statistics suggested are the number of attendees, papers published, special issues of journals *etc.* The task of preparing some recommendations about how to evaluate conferences will be started after our meetings in Torino.

Ron D. Weir
Chair, Evaluation Committee