International Union of Pure and Applied Chemistry
Committee on Chemistry and Industry

Chair Dr. Bernard West

COCI Annual General Meeting and Project Work Group Meeting
IUPAC General Assembly, Sao Paulo, Brazil
July 9-10th, 2017
Minutes

Participants for all or part of meeting:
COCI Members

Bernard West (Chair); Carolyn Ribes, Kazuhiko Ishikiriyama, Anna Makarova,; Ruan Tian (representing Zaiku Xie), B Saha, Roland Andersson, Robert Audette, Lene Hvid, Klaus Griesar, Mark Cesa, Patricia Grinberg, Wandee Luesiawong, Colin Humphris, Nobu Kawashima, Mr. Keitaro Tanaka, Richard Hartshorn, Atsuo Kobata, Austin Ochieng, Maria de Lourdes Rivera-Rosado; Fabian Benzo, Mariana Rezk, Daniela Hernandez, Robin Hutchinson, Marc Reid, Navneet Goyal, Laura McConnell, Bernadette Lockyer.

Regrets: Paul Baekelmans, Zaiju Xie, Bryan Hanley.

Sunday July 9th 2017 - PROJECT WORKING TIME

1. 09.00 to 10.00Company Associates Project [Carolyn]

Colin Humphris, IUPAC Treasurer and former Secretary of COCI, will join us for this discussion as it is an important aspect of the future of IUPAC:

a. Update on the plan for this project into implementation of the proposal and updated Bylaws.
b. Define objectives and what COCI needs to do (focus on 201, 2018, 2019 activities and desired outcomes).
c. Select members of the Project team to achieve the objectives.

The Chemistry International Article (CI March-April 2016, 19) described the results of the CA survey that was conducted during the last biennium. Based on this COCI prepared a proposal for the IUPAC leadership. The discussion focused on the "why" (content, technical engagement, projects, etc. that are relevant to IUPAC and industry) and the "how" (the process of how CA is structured and managed). The proposal has been discussed by the IUPAC Bureau and several elements are up for consideration at the Council meeting this week. There will be some changes to how the CA program is structured and managed. The real change is focus on the engagement of industrial scientists and industry in IUPAC across all aspects of the organization. We have to articulate the value proposition of IUPAC to industry. Some of the benefits for CA would include:

- CA will receive discount on IUPAC publications from DeGruyter and will have the right to nominate scientists for election to Associate positions in Divisions and Standing Committees.
- Opportunity to contribute ideas to scope projects, define needs for standards, nomenclature, best practices, and technical reports.
- Benefit from application of global scientific expertise to a particular topic.
- Opportunity to reach and engage with chemists across geographies.
- Opportunity to communicate with public and private sector chemists and engage on issues of scientific and technical importance.
- Opportunity to partner with scientists to provide independent and objective technical expertise on important issues (examples include education, public outreach, sustainability, safety and security).
- Opportunity to collaborate with international scientists and organizations to make a positive impact on the scientific field or society.
- Company Associates will be recognized on the IUPAC website and selected publications.

- Sponsors of events, conferences, workshops, etc will be recognized as defined by the event organizer
- Opportunities for companies to nominate scientists for election to Associate Member positions in Divisions and Standing Committees irrespective of home country.

The challenge for COCI is to build the visibility of what IUPAC does that is meaningful to industry. We also need to improve our work process for managing the CA scheme. To facilitate this, we will create a project team to work on this implementation. This will be COCI led, but we do need members that are not on COCI to ensure the success of the program and the integration of the effort across IUPAC.

PROCESS: Want to launch the program in 2017; need the dialog and the content. Promote value side. Communicate with NAO (we will allow them to opt out and run their own program). Since we want to offer the option for nominating scientists for AM positions, we have to work that aspect out well in advance of the 2019 election cycle. Managing contacts, finances: Secretariat. Need two contacts per company (financial and technical/business/R&D – decision maker).

CONTENT: Belongs to IUPAC as a whole. Value proposition has to be clearly stated. Describe the value that IUPAC brings to industry. (Standards, nomenclature, projects, green chemistry, big data, ICSU women in science project, IUPAC 100, etc.). COCI has the role of distilling what we do into the impact (push the outputs into the strategic objectives). We can collect this information from the Divisions and Standing Committees and compile it to share with CA members. This is something that COCI can do annually.

Comments: it takes time to build the network to have the higher level leadership engaged, it helps to have a staff person coordinate this (since implementation is key, and volunteer societies can struggle with this). With all the improvements we have seen in IUPAC structurally and organization, we will still struggle to do this with a limited staff. (Can we get to the point that we have sufficient funds to afford someone to lead this and expand what IUPAC can do)? Connections with individuals in corporate leadership are key.

Comments about Japan CA program: They are also seeing a decrease in CA membership. They provide the opportunity for members to get together. PR is important, need to have documents that describe this. Concern is that currently, not receiving publications from De Gruyter (breakdown in distribution process). Have annual IUPAC meeting with CA, report on activities from COCI and Divisions. Also, there are historical reasons that created a strong CA (based on strong leadership from an individual). IUPAC is viewed as driven by academia, so that perception makes it harder for business to engage. As companies globalize, they are looking at other organizations to be global (examples: national academies of science, international industrial organizations).

Industry will want to see some specific accomplishments and benefits from projects, and it is up to IUPAC to point these out. IUPAC needs to be an authoritative body speaking on chemistry, we have to be seen as unbiased and independent. This is a strength that we cannot afford to give up; we can't be a voice that is part of industry.

Suggest we try a push to get a few leading companies to engage at the 10K level to get us started. We can start with people at this table (Dow, Sinopec, Merck, etc. since they may know who to contact, but also what to say). Some of the companies we ask will say no, but we still need to ask. To facilitate this, COCI should provide the information and the "ask". We will have to have strong communication on these proposals within IUPAC and CA sphere. Going forward, it would be helpful to have 2 types of contacts for each CA: a technical/business contact (related to the work of IUPAC) and the accounting contact (takes action on the invoice).

Action item: Carolyn will send emails of participants to Cesa, who will distribute the Company Associates Survey.

Action item: Carolyn update CA proposal to match the text from within the Council Agenda as a more final summary (post Council meeting).

Write a summary on what IUPAC does for industry for CI, post on website. (Ask divisions to contribute their part).

Action item: Carolyn to send out notes to Divisions, ask for representation on new project. Also ask them to respond how they are currently engaging with industry, projects that have been completed in past 5 years that benefit industry.

Project team: Carolyn Ribes, Colin Humphris, Mark Cesa, Saha, (ask for 2 division reps), Roland (esp. for fundraising). (Others in the room willing to read the documents and provide responses). Short-term deliverables: Communicate proposal to NAO and collect feedback; collect feedback as possible from existing CA; finalize recommendations from proposal into a final CA scheme. Create documentation to recruit companies. Collect input from IUPAC units on activities related to industry. Communication about the changes to the IUPAC community. Understanding if NAO will opt to drive their own CA program independent of the COCI-driven one.

2. <u>10.00 to 11.00 SAICM Actions. [Anna]</u>

a. Summarise the work of the Project to date
b. Develop follow up plans and define a specific project.

Strategic Approach to International Chemical Management. 90 NGO, 10 IGO, 175 governments are engaged. IUPAC has an interest and many projects align with their strategic initiatives (Chemistry International, Nov-Dec. 2016, 8-11). ICCM4 (Intl Conference on Chemicals Management endorsed 2020 goals with 11 basic elements (across the life cycle). Point 11: development and promotion of environmentally sound and safer alternatives is a strong fit; perhaps also science-policy interface.

- For science-policy interface, SAICM wants science advice on chemical and waste by international bodies and informing policy makers of the science. IUPAC is already the Chemistry Partner for Scientific input for OPCW (Organization for Prohibition of Chemical Weapons). Do we want to do something similar for ICCA? If we become a full NGO participant with funding from SAICM, that allows us to add someone to manage the relationship.
- Sustainability and green chemistry (esp. if SAICM continue after 2020). IUPAC can make available science-based standards.

Proposal is IUPAC could be leader in involving chemical enterprise for green chemistry and setting standard. Steps include create a registry, questionnaire for self-diagnosis of enterprise and rating system/labelling system that would drive improvement (Use an example of the green building standards – has range of types of buildings that they certify). Then we will have a poll of companies that are involved in green chemistry and have a group to work with on the next standards and future activities.

IPEN pushing for toxic-free future for all.

IUPAC could contribute system of standards of evaluation, system of reporting and declaration, system of labelling. Ana shared some thoughts on ICCA and limitations of Responsible Care and industry participation/understanding of green chemistry; needs more encouragement. There are funds from GEF (Global Environmental Fund) to develop project on priority issues, and new framework for green economy at scale and spark responsible consumption and product. There is a small grant program ($50K - $1millon), so there could be an opportunity for IUPAC, especially in collaboration with others.

Organizing second training seminar on promotion of Responsible Care for Eastern Europe and Central Asia; perhaps this could be leveraged by IUPAC to disseminate the information (CEFIC experts could be leveraged as well.). IUPAC knows how to convene a group and gather experts. Could leverage this to Africa, for example.

Comments: Many chemical companies don't want to be rated if it results in a negative image (buildings us this as positive recognition/not a penalty).

Can we focus our activities, perhaps with the Divisions, esp. Division on Green Chemistry and Sustainability? We need to be precise on what we focus on that we can uniquely do. We are accredited with SAICM, can we use the model we have with OPCW – they look to us to provide science input to their policy discussions. Could we do that in a similar way for SAICM? Should we try to establish a MOU with SAICM, or better to focus on the Responsible Care training (along with ICCA) in Africa. We should ask the question of SAICM (are they interested in MOU) or do they want us to focus on specific projects. Having this conversation with SAICM secretariat allows us to build the relationship. Working on specific projects can lead to discrete accomplishments that are not diluted and allows IUPAC to create strong deliverables. Potential projects: green chem, life cycle, RC. We need to have the conversion internally on what projects we can deliver.

Action item: Anna will share her presentation (as .pdf) with Carolyn.
Action item: conversation with SAICM: Anna work with (Bernard, others) regarding the interest SAICM has in MOU.
Discussion with key partners on specific projects.

3. <u>11.00 to 12.00 STP Projects. [Bernard and Robert]</u>

This will be a review, more detailed information and plans will be made at the Safety Training Workshop.

a. Health, Safety and Environment Program [BW]
b. Brief update the STP Regional Workshops and the possible links with ICCA around Responsible Care in Africa.
c. Safety Training Program and links with CRDF/CSP.
d. Responsible Care implementation in Africa.
e. Communication: Discuss what information to be shared and what should be posted on website, published in CI, etc.

Introduction of Austin Ochieng – interested in being STP trainee, also working with OPCW.
STP: Started in 1990's, it provides safety training to chemists from developing countries to visit a host company and learn about EH&S best practices and building a strong safety culture. We have several applicants (but need to update our forms and database) but the limiting step is identifying host companies. We do have some funding from CRDF. Most of the training available has been in English. Applicants should be mid-career so that they have the influence and position to drive change in their home institution. Once we have hosts, we give them list of applicants, they select the fellows they want to train, develop the training. Host Company provides local accommodations; IUPAC provides training to the site. Fellows must provide a written report of how they will use their training to implement improvements in their institution or company. These follow-up plans are very important and are posted on the IUPAC website. We use the workshops to share progress against these plans. This year, Solvay hosted 2 people in UK and Belgium. They want to host 5 next year. We also had a training session in Spanish in Uruguay for 4 people, allowing us to manage the language barrier. This is the model for a regional workshop, and we are working to create those in India too.

The US State Department Chemical Security department works with CRDF (Civilian R&D Fund) and they provide the funding for travel for fellows from specific countries, and then training to participate in the follow-up workshop at WCC. We have some money available until February 2018.

Responsible Care is an integrated management system and requires support and engagement for top managers. Anna has worked with team to create a 2 day program related to this, sharing best practices on implementation on RC. Helps them understand what it takes to implement and why it is important. Bernard has done this with ACC in Egypt.

Action: Robert: update the best practices/endorsements from host companies. Team: Can we identify an opportunity to give a presentation about the STP to a large industrial group. (CEFIC, ACC, etc.). Responsible Care meetings are a possibility; Bernard has talked with them.
Action: Be strategic about identifying host companies: Carolyn will ask if she can talk with the Corporation Associates at ACS about STP (work with Bernard/Robert on appropriate presentation).
Action: need to provide communication about the workshop and visibility.

12.00 to 13.00 BREAK FOR LUNCH.

2016 COCI ANNUAL GENERAL MEETING.

13.00 I. ORIENTATION.

13.00 **1. Introductions [BW] Round table member introductions.**

Members and visitors were welcomed to the COCI meeting.

Comments from Secretary General (Richard Hartshorn) at Morning Session: While we do have to be concerned about IUPAC budget and financial sustainability, we also need to have sustainability of science and our Divisions/Committees. Succession planning is important: we need to have a leadership pipeline. Also need to be sure to engage young observers in various ways and on our projects. There is a proposal for the evaluation committee to review the Division and Committees to ensure we are as effective and productive as we can be. Council will vote on new Interdivisional Committee on Green Chemistry and Sustainability. Can we keep adding – or do we need to cut back on some things (limited resources). We don't engage with as many companies as we could; IUPAC needs to be understood how we deliver value and have them want to work with us. We need to have better interactions between COCI and the Divisions to drive awareness, so they all identify opportunities. COCI needs to reach out more to other units, share what we are working on, and engage them. Need to engage Divisions in finding the industrial talent that can engage, and potentially be nominated for positions (pending Council approves it).

Review IUPAC strategic plan:

Our Vision

IUPAC is an indispensable worldwide resource for chemistry

Our Mission

The International Union of Pure and Applied Chemistry 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.

IUPAC accomplishes its mission by fostering sustainable development, providing a common language for chemistry, and advocating the free exchange of scientific information.

In fulfilling this mission, IUPAC effectively contributes to the worldwide understanding and application of the chemical sciences, to the betterment of humankind.

Our Core Values

Our core values are the guiding principles that guide the conduct of the Union and its relationships with its stakeholders. IUPAC's core values emphasize scientific excellence, communication, transparency, diversity, and ethical behavior. These behaviors are practiced by all of the Union's volunteers, staff and stakeholders.

- We serve humankind by advancing chemistry worldwide.
- We view scientific excellence and objectivity as the cornerstone of all our work.
- We value collaboration and communication among all our stakeholders.
- We strive for diversity and inclusiveness in all forms.
- We respect each other and the Union.
- We uphold the highest standards of transparent, responsible and ethical behavior.

GOALS (immediate and long term)

- Provide scientific expertise to address critical world needs.
- Increase the value of our products and services.
- Improve the vitality, effectiveness and efficiency of our Union.

MEASURABLE OBJECTIVES (immediate – substantial progress in coming biennium)

- Brand IUPAC in the minds of stakeholders
- Improve quality and frequency of communication with stakeholders
- Increase revenue
- Expand and retain Member base
- Enhance interdivisional interaction and collaboration
- Emphasize multidisciplinary projects addressing critical global issues
- Support chemistry education in developing countries

2. The membership of COCI: 2016 – 2017 and 2018-2019

- Review the results of the election process for COCI membership in the next Biennium and discuss a proposed process for the next election in 2019.
- Review current committee performance against the roles and responsibilities and use that as a basis for discussing how to develop the membership.
- Seek input new members.

We completed the nomination process with Paul Baekelmans as the leader of the nominating committee. We are pleased that we will be able to welcome some new TM and AM for the next biennium. Bernard has completed his maximum years of service but can contribute to projects. (Carolyn asked him to lead the next nominating committee). **Terms are 4 years, renewable one time. Officers can stay an extra 2 years.**

Proposed Slate for 2018-201:
TMs

- Carolyn Ribes (USA/Netherlands) (Chair) (formerly Sec)
- Bryan Hanley (UK) (Secretary) (formerly TM)
- Robert Audette (Canada) (formerly AM)
- Paul Baekelmans (Belgium) (continue as TM)
- Kazuhiko Ishikiriyama (Japan) (continue as TM)
- Anna Makarova (Russia) (formerly NR)
- Bipul B Saha (India) (formerly AM)
- Zaiku Xie (China) (continue as TM)

AMs

- Sherif Abdeldaiem (Egypt) (new recruit)
- Daniel Bernard (France) (formerly AM)
- Chang-Hyung Choi (Korea) (formerly AM)
- Klaus Griesar (Germany) (new recruit)
- Lene Hviid (Netherlands) (formerly AM)
- Michelle M. Rogers (USA) (formerly Div VIII rep)
  (*Editor's Note: the following procedural information was obtained after the COCI AGM and is added here for information: The Committee submitted the slate to the Secretariat. Appointments are made by the IUPAC President and will be reviewed at the Executive Committee meeting in November. COCI members should hear about 2018-2019 appointments by December 1, 2017.)*

For future elections, what information do we want to collect about nominees to make the best decisions? Here are some questions we will propose to the Secretary-General.

1. Why they are interested in COCI,
2. what they bring to the committee,
3. their previous engagement/interaction with industry or industry associations.
4. and previous engagement/interaction with IUPAC or other chemistry-related organizations such as industrial associations.
5. A statement of interest, what they might want to achieve during that time period if they join the committee.

We need a nominating committee chair for next cycle. Bernard West will do this. He requests suggestions now for National Representatives for countries that have 2 CA now (or 3 in a region).

The following changes have been proposed to the Council for the terms of office for COCI.

(*Editor's note: They were approved by the Council*).

COMMITTEE ON CHEMISTRY AND INDUSTRY (COCI)

Composition and Terms of Office

(i) There shall be a standing Committee on Chemistry and Industry, composed of a Chair, a Secretary, six other Titular Members and up to six Associate Members. In addition, each NAO representing a country having more than one Company Associate may propose a National Representative to COCI. By mutual agreement, two or more NAOs in a given geographic region that has more than three Company Associates may jointly propose a National Representative from that region.

(ii) The President, in consultation with the Executive Committee, shall appoint the Chair, the Secretary, the Members and the National Representatives. The President may, at his/her option, designate one of the Titular Members as Vice-Chair. Candidates may be proposed by the Committee on Chemistry and Industry, by National Adhering Organizations having Company Associate programs, or by Company Associates. The Committee should conduct elections, according to the pattern for Divisions, in order to inform the advice that they give to the President.

(iii) The period of service for all categories of Members and National Representatives shall be four years, renewable for a further term of four years, subject to (iv), below.

(iv) The Membership shall be reviewed every two years by the incoming President, in consultation with the Executive Committee.

(v) The sum of the years of service as a Member and as the Chair or the Secretary shall not exceed ten years.

Comment [RH10]: The addition of Company Associates as a nominating body results from a recommendation of the 2017 Bureau.

Comment [RH11]: Included so that the President can make changes if needed or desired, and noting that otherwise (iii) and (iv) are in conflic

3. Review minutes of 2016 AGM in Beijing September 2016 CR
Minutes were approved. Carolyn will have them posted on the COCI webpage (*Editor's note: this was delayed, Robert Audette posted them in Feb 2020*)

The AGM was scheduled in conjunction with IMRET and the presentation of the ThalesNano prize on Flow Chemistry. The call for nominations for the 2018 ThalesNano prize will be issued in September.

4. Budget and Finances CR/BW
The proposed budget basis for 2018-2019 was shared. COCI will receive a ~5% reduction in total budget (from $37,000 to $35,000). Based on our current spending patterns, a decrease in our operating budget should not be a challenge for COCI.

The committee appreciates the financial support from Sinopec, Solvay, and ThalesNano during the biennium.

14.30 BREAK

15.00 II. REVIEW OF EXECUTIVE AND BUREAU ITEMS RELEVANT TO COCI

5. Review of report and Presentation to BUREAU
And Verbal Report on current issues [BW]

The report to Bureau can be found in the IUPAC Council agenda book. Bernard and Carolyn reviewed the presentation to be shared at the Council meeting on July 13; a copy will be posted on the website.

Action item: Carolyn to update report to Council and share with meeting minutes.

15.30 III. RESULTS AND PLANS FOR COCI IN 2017 input to 2018-2019 [BW, CR]

6. First STP Regional Workshop.

The LA-STP was very successful. Four Fellows were trained in October in 2016 at the Republica Universidad in Uruguay in the program organized by Professor Fabian Benzo. A report will be delivered at the STP workshop on July 10. Conducted an evaluation with feedback from Fellows, results were excellent. The objectives were achieved. The organizers are interested in continuing the program. They had 40 applicants from 10 countries, demonstrating the good communication they had and the interest in the material. Fellows were from academia (Argentina and Venezuela), industry (Columbian industrial association), and government (Costa Rica). Since the course material has been developed, it is easier to organize the next one. Raising the funds to bring the Fellows to Uruguay is the challenge (estimated $8,000 for the session). First was funded by IUPAC and COCI and UNITAR. The success of the first session encourages us to continue this in other regions, too.

7. Regional Workshop Beijing.

The summary was published on the website and in CI and also described in the 2016 AGM minutes. There are a few open action items.

8. Status of main projects from the morning work session.

(See top section of document).

9. Discuss and agree on meeting times and places within resource available.

There will probably be a handover for the officers in the last quarter of 2017. No final plans have been set for the 2018 AGM. One option is to link it to the IMRET meeting in Germany I 2018 (when ThalesNano prize is presented). (*Editor's note: The handoff for officers could take place in London on November, offering the opportunity for a CA project meeting as well. The officers discussed having a TM planning meeting following the 2018 Bureau meeting, April 6-8, in Bratislava*).

10. Other business:

1. Global Code of Ethics for Chemists, Dr Saha.

Dr. Saha presented the results of a global group that met in Malaysia to create a global code of ethics for chemists. The presentation will be posted on the COCI webpage. COCI encouraged Dr. Saha to work with others to publish an article on this in CI.

Discussion: how does this overlap with national society Code of Ethics or Conduct? What are the consequences if a chemical professional doesnot follow them? There do not seem to be clear and global consequences. This was initiated to provide a platform for countries to use internally. ACS is encouraging this. This should be covered by Chemistry International; need to ask Fabienne if it has been published (if not, ask Dr. Saha to help create one). Perhaps the consequences issue is something to explore in an appropriate way. Opportunity to put in framework in IUPAC, could be added to STP as a topic, if it isnot already there. Could we make this an expectation for the Fellows action plan as output of their training. Responsible Care handles it –in some countries. If you don't follow the process, you may ot be able to join the industry association. OPCW;IUPAC have some principles they developed together, how does this intersect that? Has IUPAC endorsed this code of ethics, if not, COCI can raise this.

Action item: Carolyn to send out slides abou the Code of Ethics presentation with notes. Investige if CI article in works, otherwise create one.
Action item: We communicate an expectation to the STP Fellows that they align with the Code of Ethics.
Action item: Carolyn and Bernard: Has IUPAC endorsed this code of ethics, if not, COCI can raise this issue.

2. Brainstorm ideas for new projects

3 projects have been proposed by Sinopec.
PROJECT 1: The mechanism of reaction runaway for hazardous chemicals under complicated conditions
1. Background:

Exothermic reaction is widely present in the chemical industry. Once the thermal reaction runaway occurs, the high temperature and high pressure will result in an explosive damage to the reaction vessel. Statistics demonstrate that chemical accidents caused by therma1 reaction runaway accounts for 24.1% of the total accidents. However, both the mechanism and characteristics of the exothermic runaway and the runaway prevention and control technology are not fully understood. Theory research still cannot replace the experiments, while experiment study (such as heat-measurement experiment) has some disadvantages such as highcost and lowefficiency. A perfect system needs to be established and the experiment cannot be isolated from theory research. We need a deeper understanding of the microscopic mechanism, and the process safety can be developed only when various coupled interactions between chemicals have been identified.

2. Research contents
This project mainly studies the mechanism of reaction runaway for hazardous chemicals. We need to properly select several typical reaction systems, and carry out in-depth analysis of molecularstructure, functional groups, bond type/energy, and the chemicalthermodynamics and kinetics. Then combine the theory research with heat-measurement experiment and various factors during the actual chemical process. Finally, we can establish an exothermic model which can be usedto predict the runaway risks in the chemical reactions.

3. Main problems
The main problem is how to calculate the energy transfer and exothermic processprecisely at the micro-scale. It needs a deeper understanding on the reaction mechanism. In addition, most runaway reaction problems in chemical engineering process are complex and influenced by many interactive mechanisms, such as the existence of impurities, removal method of heat, fluctuations in temperature, and equipment structure. To investigate the mechanisms of runaway reaction under complex conditions, we should identify various coupled interactions between chemicals and combine them with more accurate basic data.

Discussion:
While the specific laboratory work is basic research and not an IUPAC product, is there an opporutuity to share some of the best practices for managing this inforamtion, or putting the need for more research out to academic community. Not all companies have the same access to this training and information when designing and operating the process, or modifying the process. COCI could play a role with respect to global awareness about available resources. Could also put this into the safety training program. Is there a compliation? Perhaps IUPAC Divisions will have some suggestions about this.

Action item: Carolyn will check with her company experts – what is available externally with respect to databases, information, training, etc. If there is material readily available, perhaps a CI article?

<u>PROJECT 2:</u> Establishment of life cycle assessment and management system for hazardous chemicals
1. Background:
UNEP (United Nations Environment Programme) predicts that China will produce about 30% of the world's chemicals by 2020, and about 10% of the products are toxic chemicals. The management of chemicals was spread across many departments in China, and there is still no systematic management for the whole life cycle of chemicals, especially hazardous chemicals. We believe that IUPAC has a unique perspective on this field, for example, IUPAC held a conference on Solid Urban Waste Management at 2016, and carried out the research on chemicalswith heavy metal on a global scale since 2004 (Project No.: 2004-003-3-600).

2. Research contents
The main purpose of life cycle assessment (LCA) is to provide a quantitative assessment of the environmental impact of products over their entire life cycle. All direct and indirect environmental impacts associated with the product, process or activity is included in the assessment.
Based on the manufacturing process of hazardous chemicals, the scope of LCAencompasses extraction and processing of raw materials, manufacturing and assembly processes, product distribution, use, re-use, maintenance, recycling and final disposal. In addition to the health hazard and environmental effect, the risk of combustion and explosionis a very important factor to be considered. Appropriate manner of packing, hazard identification, and training can reduce the incidence rate of significantaccident, such as the exploration accidents in Tianjin (8.12.2015) and in Pakistan (6.25.2017).Based on the hazard identification (such as QSAR) and quick screening of chemicals, we can establish an assessment system which includes the management of complete process of hazardous chemicals.

3. Main problems
The first problem is about the acquisition and copyright of related data. There is still a lack of our own database in China, and it may need authorization to use open international database (such as CICAD, CAMEO and HSDB), If so, how difficult will they be to acquire?
The other problem is how to screen and estimatehazardous chemicals. There is no perfect mechanism for control chemical safety and socialrisks. We hope that IUPAC could help to provide training and instruction.

Discussion: Is it possible to set some standards? There could be a project here to define some common standards, perhaps with Sinopec and Divisions? This could be a huge project to define – where do we start and stop the analysis for a particular product or process. Defining life cycle in one narrow product family can cost $200,000, which is beyond our range. Perhaps just collecting some examples for a resource page – models that might be used by others. There was going to be a CHEMRAWN but it did not focus on life cycle analysis.

PROJECT 3: Safety training and emergency response system for chemical industry
1. Background
Accidents due to dangerous chemicals occurred more frequently in China. These accidents not only seriously threat the safety of people's life and property, but also possibly damage the environment of water, air and land.However, it happened for many times in China that fires, explosions, and toxic releases occurred during the rescue process,and sometimes resulted in more serious consequences than the raw accident itself. So we need to instantly identify the complex risks and carry out the response. It is imperative toimprove the quality of safety training for manufacturer, storage and transport system, and management department as well as relief agency. There are several problems in the safety simulation training in China, for example, the technologylevelsare belowinternationalstandard, the character of experience isn't strong enough, and the examination modehas shortcomings. Although3-Dtechnologyhas been implementedin recent years, there are a lot of defects in the 3-D training system.

2. Research contents
The aim of this project is to develop an efficient safety simulation training system as well as an emergency response mechanism based on 'Internet +'. We need to learn from the experience abroad, and take full advantage of internet and cloud computing, and then build a rapid nationwide emergency response mechanism. 3-D training platform based on virtual reality and intelligence behavior algorithms, as well as physical training platform with quantitativeassessment standard is in great need.

3. Main problems
The safety training and especially the emergency response mechanismare large and complicated, and it may spread across many departments in China to gather information about hazardous chemicals. Besides, the intelligence behavior algorithms during the training process and the quantitativeassessment standard are also difficult.

Discussion: Perhaps a project to define best practices for HazOp, share whatever training may be availablee. There may be different rules and training in different countries. Where could these be found? Examples are the review and case study of Chemical Safety Board (www.csb.gov). This may capture interest of chemical industry associations. SHARE (canadian program).

Action item: COCI to share these ideas for potential projects with the other units to see if someone is interested. Could also be something to share with Company Associates to see if there is interest or other best practices. BP has a 3-D virtual animated enviroment IGLOO.

Possible project: Laura McConnell, Division, new Interdiv Committee Green Chem. She has worked with the Presidential Green Chemistry Award from the USA. No development has been done yet, this would start from the beginning. Need to understand what awards already exist, to avoid duplication or leverage good ideas. Would we be interested in a project team that would create similar awards at the global level (include IUPAC, Industry, NGO): this could be done at IUAPC 2019. Not a financial award, it would be a recognition and prestige. Could also do something related to life cycle analysis with this group and requires technical expertise.

Action item: Interested: International award for companies for Green Chemistry: Saha, Klaus Griesan, Xie (Carolyn to send names to Hemda and Laura).

Anna idea: project for framework SIACM:Green Chemistry theme First step: start discussion with various groups, GEF, IPEN, etc – a survey or gathering of what companies are doing, what they think about. Need to write the project description and fill out the form with what will be delivered, timing, etc. Bernard has some framework developed that would be part of this project (some quesitons to be answered as part of the project). Need to review Tundra project, too.

Action item: Ana will start the project description for Green Chemistry-related project for SAICM.

3. Discuss TM assignments.
WEB PAGE: Secretary will post some (Carolyn Ribes; Bryan Hanley). Need everyone to provide content.
CA project: Carolyn Ribes, Kazuhiko Ishikiriyama, Klaus Griesan, , Colin Humphris, Mark Cesa, B. Saha and Lene Hviid (proposed)

STP: Robert Audette, Paul Baekelmans, LA STP (Fabian Benzo and Mariana. (this could be a subcommittee that drives multiple projects). (Editor‘s note: a more complete discussion on this topic was recorded during the Safety Training Workshop on July 10).
IUPAC 100: B. Saha Daniel Bernard
Green Chemistry Interdiv comm: Anna Makarova and B. Saha
Specific projects: Xie,

4. Web page

Webpage: who will be the COCI contacts to have access? (Carolyn and Bryan) What existing information n do we want to post (re: projects, role descriptions, photos, etc.). The Secretariat is ready for us to post information directly. We need to keep the page current for our internal IUPAC communications but more importantly externally.

16.00: MEETING SUMMARY, ACTION PLAN and ASSIGMENTS AND CLOSE MEETING

MOVE TO OPENING CEREMONY – Golden Hall
NOTE THE COCI FAMILY DINNER WILL BE ON MONDAY 10th JULY AT 7.30 pm
AT Fogo de chão. We will need to take taxi’s. Probably leave the Sheraton WTC at about 19.00 PM (so meet at 18:45)