### Introduction

# Rafiqul Gani President, EFCE



#### **Qualifications**



#### **Educational**

- BSc-Chem Eng (BUET, Dhaka, 1975)
- MSc-Chem Eng, DIC (Imperial College, London, 1977)
- PhD (Imperial College, 1980)

#### Other

- Fellow-AIChe (2008)
- Fellow-IChemE (2009)
- Member of the Danish Academy of Science (2010)
- Sargent Lecturer Imperial College (2007); Bayer Lecturer –
  Carnegie-Mellon Univ (2013); ORYX-GTL Lecturer Texas A & M
  Univ in Qatar (2013)

#### **Positions Held**



#### **Employment**

- Senior Researcher/Assistant Professor, PLAPIQUI, Universidad del Sur, Bahia Blanca (1980-1985)
- Visiting Researcher, DTU, Lyngby (1985-1986)
- Assistant Professor, Associate Professor, Professor, DTU, Lyngby (1986-present)
- Co-founder and head of CAPEC, DTU, Lyngby (1997-present)

#### Other

- Editor (2006-2009), Editor-in-Chief (2009-present): Computers & Chemical Engineering
- Co-editor, Elsevier book series on Computer Aided Chemical Engineering (2001 – present)
- Advisory Board Member of several journals

#### **Experience**



#### **EFCE**

- Delegate, CAPE-WP (1990)
- Chairman, CAPE-WP (2001 2007)
- Executive Board Member (2008 2013)
- Scientific Vice President (2012 2013)
- President (2014 2016)

#### Other related activities

- Organizer of ESCAPE-1 (1992) and ESCAPE-11 (2001) events in DK
- Organizer of ECCE-6 (2007) in Copenhagen
- Organizer of special sessions at AIChE Annual Meetings, CAChE events (FOCAPD)
- Member of the Board of Trustees: CAChE Corp (2011-2013); AIChE (2010-2013)

#### Research



#### **Interests**

Multiscale modeling for managing the complexity in processproduct design; Sustainable process design and analysis, including process intensification; Computer aided product (molecule and formulation) design; Development of systematic computer aided methods & tools; Development of predictive models for estimation of properties of chemical systems.

#### Other related information

- Number of PhD-students graduated 47; currently supervised 18
- Number of peer-reviewed journal publications 200; edited books 5; chapters in other books 27; reviewed conference papers 150
- H-index in ISI 29; SCOPUS 31; Google Scholar 40

## **Mission of EFCE**

# **Professor Mike Considine Executive Vice President**



# Introduction

Professor Mike Considine, BSc, PhD, FIChemE, CEng

#### **Current Position**

- Professor of Process Safety and Loss Prevention, Chemical and Biological Engineering Department, University of Sheffield.
- Managing Director of ChemRisk Ltd, Process Safety Consultancy





# **Key Skills and Experience**



- World recognised expert in process safety and loss prevention, with more than 30 years experience in the chemical, nuclear, regulatory, insurance and oil and gas sectors. Organiser and presenter at numerous seminars and conferences and recipient of a number of professional awards.
- Well connected within the process safety and loss prevention community with linkages with academia, industry and regulators via professional institutions and industry bodies. International experience of leading and working with professional and industry bodies. Experience of developing and working with internal networks within large global organisations.
- Broad international experience, covering most parts of the world and working with professional engineers from many different backgrounds and cultures.
- Former head of a corporate team in a major oil company responsible for setting major hazards policy.
- Broad knowledge of the organisational and operational aspects of major companies and experience of dealing with people at all levels up to CEO. Current advisor on process safety to the SHE board sub committee of National Grid.
- Extensive experience of the development and delivery of process safety training courses around the world.
- Director of the MSc course in Process Safety and Loss Prevention at Sheffield University

# **Professional Activities**



- Secretary of the European Federation of Chemical Engineers Loss Prevention Working Party since 1998.
- Member of the I Chem E Safety and Loss Prevention Subject Group and chairman from 1998-2012.
- Trustee of the Hazards Forum 2005-2011 and appointed life member in 2011.
- Past member of the Advisory Committee on Dangerous Substances.
- Participated in numerous industry and governmental working groups including:
  - CCPS Risk Tolerability Working Group
  - CONCAWE Chaired Land Use Planning Working Group
  - Global Benchmarking Group Lessons Learned Working Group
  - ACDS Risks Associated with the Transport of Dangerous Goods
  - HSE WG on applicability of Pipeline Safety Regulations to gasoline pipelines
  - LPGas Association Major Hazards Working Group
- Member of the Scientific Committee for the last five European Loss Prevention Symposia, responsible for selection and review of conference papers. Chaired the organising committee for the Edinburgh 2007 Loss Prevention Symposium.
- Author of numerous papers and presenter at international events on Major Hazard management.
- Winner of a number of awards including
  - Two BP Chairman's Awards in 1996 for studies relating to risk management of shipping operations in the US and LPG distribution operations.
  - Three I Chem E Medals Junior Moulton Medal in 1982, I Chem E Franklin Medal in 2007 and Arnold Green medal in 2011

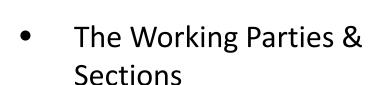
#### The mission of the EFCE

The European Federation of Chemical Engineering will...

- 1. Serve the European Chemical Engineering Community
- By providing a platform for views and opinions and identifying opportunities for its voice to be heard
- 2. Support Chemical Engineers within EFCE Member Societies
- · Working Parties and Sections
- · Conferences and Seminars
- Newsletters, Website and e-bulletins
- 3. Support the Education and Training of Chemical Engineers within Europe
- · Active Education Working Party
- EFCE Journals
- Input Into Development of Curricula
- Training
- Bursaries
- 4. Influence Decision Makers and Opinion Formers on Matters of Importance to Chemical Engineers
- By Helping to Shape European Policy
- · Promoting Public Understanding of Science
- . Contributing to European R&D Programmes
- · Fostering Academic/Industry Links
- 5. Initiate Collaborations in Support of Common Goals and for the Advancement of Science and Technology
- Proactive Horizon Scanning and Topic Spotting
- Bringing People Together via Respected European Technical Networks

EFCE will help European society to meet its needs through highlighting the role of Chemical Engineering in delivering sustainable processes and products

How to achieve this? (continued)



- The EFCE member societies
- The EFCE secretariats
- The EFCE executive board members



#### What Does EFCE Do Now?

- Encourage industry-academia interactions
- Promote and develop the topic and serve the topical community within chemical engineering
- Provide a forum for discussion, exchange, collaboration, ....
- Influence decision makers
- Contribute to education, training of engineers & researchers on the topic
- •

- Collaboration in the form of research projects, publications, industryacademia, ....
- Organization of conferences, topical workshops, meeting of delegates, ....
- Recognition of achievements through awards
- Education of engineers, general public,

# How Could It Do These Better? What Else Should it Do?



European Federation of Chemical Engineering Europäische Föderation für Chemie-Ingenieur-Wesen Fédération Européenne de Génie Chimique

EXTRAORDINARY GENERAL ASSEMBLY

Introduction: EFCE Scientific Vice President

Dechema, Frankfurt

Prof. Jean-Marc Le Lann 02/03/14

# Short CV presentation



- Currently acting(2006-2011/2011- ) as **Dean** of "Ecole Nationale des ingénieurs en Arts Chimiques et Technologiques" (INP-ENSIACET, Toulouse)
- Full professor(Exceptional Class) at INP-ENSIACET (1983-)
   Lecturer/Senior Lecturer at UST Kumasi, Ghana (1980-1983)
- Academic Qualifications
  - INP, Toulouse, France Chemical Engineering Doctor Engineer, 1983.
  - INP, Toulouse, France Chemical Eng. (PSE) Habilitation, 1999
- Chemical Engineering (ChE) background with PSE evolution up to Industrial Systems Engineering (IE)
- Focused Research Areas (Chemical Engineering research Laboratory, LGC, UMR CNRS, DR B. Biscans): Thermodynamics(ChE), Hybrid Dynamic Systems(DAE, Batch processes, Dynamic simulator), Management of Technological Innovation(IE)
  - **Publication record:** 5 Habilitation Diploma(HDR), 45 PhD thesis, 2 Monographies, more than 210 International Publications and communications

## Short CV presentation



#### Synergistic activities

- Member of Scientific Committee for conferences (1989-): ESCAPE, PSE,
   IE series, evaluator of Academic position,....
- <u>External Examiner</u>: MSc degrees, IC London UK (2002-2005)
- Member of AITRIZ(2001- )
- Member of the <u>Board at Conference of Major french schools(CGE)</u> (2008-2010, 2013-)
- Member of the <u>Scientific Committee at ANR</u>(French National Research Agency) (2009- )
- President of the Industrial Engineering Academic Society (2003-2009)
- President of Federation Gay-Lussac (2010-2012/2012-)
  - Member of the National Chemistry Committee (French Academy of Sciences)
  - Member of the Committee Ambition for Chemistry (CAC)
  - Member of The French Federation in Chemistry and Chemical sciences(FFSC)
- President of the Commission "Evaluation and Implementation of Diploma abroad" at Campus France (2012- )
- Permanent Guest of the EFCE WP CAPE (1987- )
- Member of the EFCE WP Education (2005-)
- EFCE Scientific Vice president

#### EFCE Scientific VP vision



- To work very closely with EFCE officers and EFCE Board members to promote EFCE at the European level using EFCE SC as a lever arm
- To give to WP & Sections more recognition and help from EFCE top management on order they feel real proactive partners
- To have EFCE young scientists more involved, invited to some committees, better publicize their work via EFCE web ,..
- To have more professionals in EFCE scientific bodies by promoting work of EFCE SC, WP and sections
- To implement new WP & sections as needed and promote new activities of major interest with a societal point of view
- To recognize Innovation involving Entrepreunariatship as major track for progress



# Thanking you for your attention







European Federation of Chemical Engineering Europäische Föderation für Chemie-Ingenieur-Wesen Fédération Européenne de Génie Chimique

#### **End**



European Federation of Chemical Engineering Europäische Föderation für Chemie-Ingenieur-Wesen Fédération Européenne de Génie Chimique

**GENERAL ASSEMBLY 3 FEBRUARY 2014** 

#### A new constitution for EFCE

Frankfurt

David Brown



- At present, EFCE is an informal association with no legal status of its own
- Any liabilities it incurs would be passed on to the members of the Executive Board or the individual Member Societies

#### BUT

 Tighter banking regulations following the financial crisis mean that for EFCE to continue to have its own banking arrangements, it needs to adopt a formal legal status

#### What we need to do



- EFCE is arranging to set up a 'new EFCE' to comply with the new requirements
- It will be a 'Charitable Incorporated Organisation' (CIO). This is a new structure that is simple to administer
- It will be incorporated under UK law, because the banking is done in the UK by IChemE staff
- The new CIO will also protect Executive Board members and societies from personal liability

## What is being done



- As a CIO, the 'new EFCE' has to have a constitution in a prescribed legal format
- Our lawyers have prepared one that allows the routine operation of EFCE to proceed in essentially the same way as now
- The Executive Board members will become the Trustees of the 'new EFCE'.
- This gives them some legal responsibilities which will be explained to them

## Next steps



- General Assembly receives the proposed new Constitution – any questions to Prof. Gani by 7 March
- Constitution (with any revisions) is approved by the Management Committee and then the Executive Board
- Approval by General Assembly (Prague)
- 'New EFCE' is officially registered
- The existing Executive Board and EFCE assets transfer to the new EFCE





European Federation of Chemical Engineering Europäische Föderation für Chemie-Ingenieur-Wesen Fédération Européenne de Génie Chimique

#### **End**

#### **CIO Constitution**

#### Next steps:

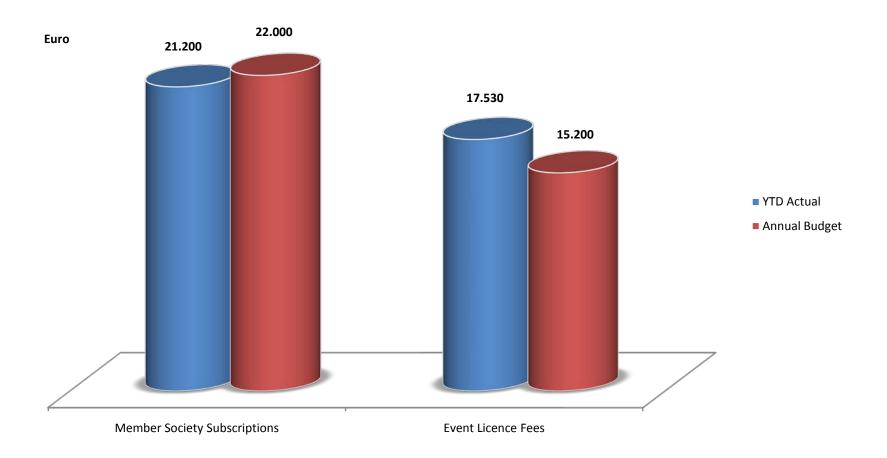
- 1. Presentation of the constitution document (David Brown) we will take a few questions but ask the participants to send their questions comments to RG (I will make sure they receive a response) deadline for sending the comments/questions is 7 March.
- 2. A revised document is prepared (by IChemE hopefully no major revision would be required) and approved by the management board (at a physical meeting or video conference) and then executive board (at a physical meeting or video conference 4 April). At this point, the constitution document is ready for approval by the member societies (at a GA in August in Prague or Electronic balloting).
- 3. Once the constitution is approved, IChemE will start the application process, which ends with the registration of the EFCE as a Charity with an approved constitution. During the period from 2 to the end of 3, the current officers (president, vice presidents, executive board members) will function as provisional officers until a formal election can take place (see the list of officers document).
- 4. A date for the first GA will be set and at this new GA, the new officers including members for the board of trustees will be elected. There will be 6 elected members from academia and 6 elected members from industry and upto 2 co-opted members by the president.

It is difficult to give exact time-tables since the dates for 2 and 3 will define the date for 4.



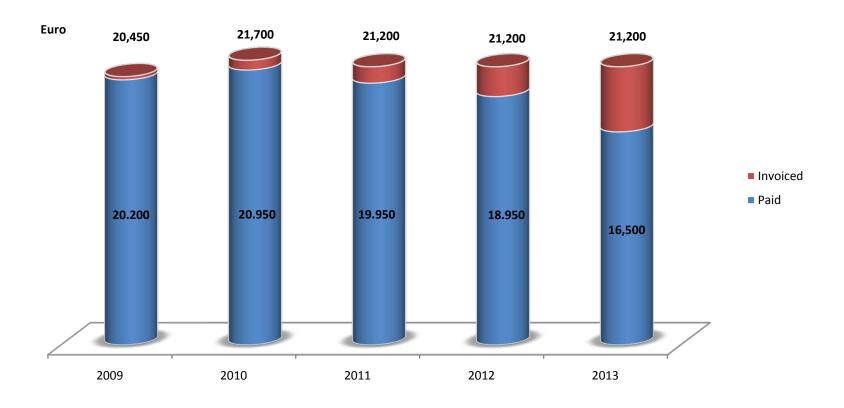
# **EFCE Financial Report December 2013**

#### 1. Income against 2013 budget



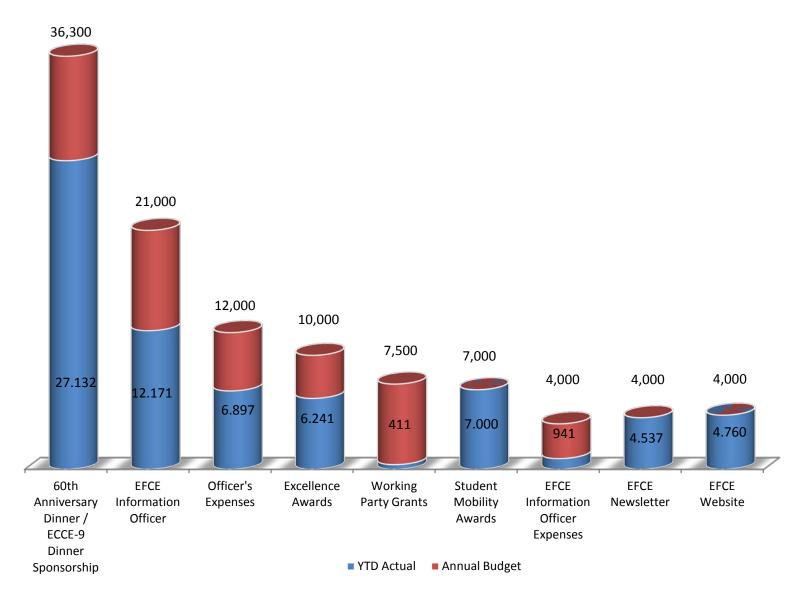
- ➤ Member society subscriptions for 2013 includes €4,200 subscription debtors
- Event licence fees includes additional income from a 2012 event invoiced in 2013

#### 2. Member Society Income



- ➤ As at 31December 2013 we have received 76% of subscription fees for 2013
- ➤ A further €4,500 is currently outstanding from previous years but has been accounted for as a potential bad debt

#### 3. Expenditure against 2013 Budget

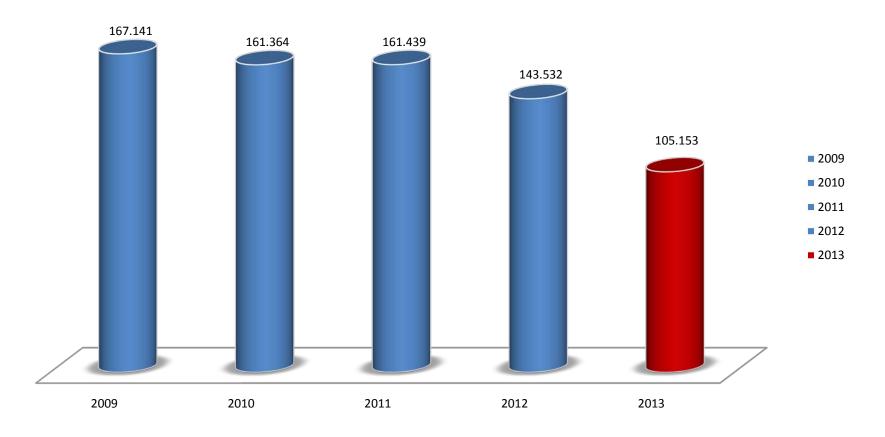


Appendix 6 (continued)

Statement of Financial Activities	2013	2013	2012
as at 31 December 2013	Actual	Budget	Actual
INCOME			
Licence fee from EFCE Events	17,530	15,200	13,890
Member Society Subscriptions	21,200	22,000	21,200
Total	38,730	37,200	35,090
EXPENDITURE			
EFCE Newsletter & Journal News Pages	(4,537)	(4,000)	(4,003)
Bank Charges	(785)	(800)	(726)
Excellence Awards	(6,241)	(10,000)	(8,649)
Officer's Expenses	(6,897)	(12,000)	(11,718)
Sundries	(2,984)	(2,500)	(6,229)
Student Mobility Awards	(7,000)	(7,000)	0
Working Party Grants	(411)	(7,500)	(3,448)
60th Anniversary Dinner / ECCE-9 Dinner Sponsorship	(27,132)	(36,300)	0
60th Anniversary Poster Prize	(1,000)	(1,000)	0
EFCE Website	(4,760)	(4,000)	0
EFCE Information Officer Direct Costs	(941)	(4,000)	(2,430)
EFCE Information Officer Staff Costs	(10,704)	(21,000)	(12,618)
Bad Debt Provision	(2,250)	(2,000)	(2,250)
Total	(77,109)	(112,100)	(52,072)
Net Surplus to Reserves	(38,379)	(74,900)	(16,982)

Balance Sheet as at 31 December 2013	2013	2012
CURRENT ASSETS		
CONNENT ACCETO		
Cash at bank	108,220	152,577
Debtors	10,192	10,000
Tatal	440.440	400 577
Total	118,413	162,577
CURRENT LIABILITIES		
Purchase ledger reserves	(8,760)	(14,795)
Provision for bad debts	(4,500)	(2,250)
Subscription creditors	0	(2,000)
Total	(13,260)	(19,045)
Net Current Assets	105,153	143,532
ACCUMULATED FUND		
Opening reserves as at 1 January 2013	143,532	160,514
Net surplus / (deficit) for the period	(38,379)	(16,982)
Closing reserves as at 31 December 2013	105,153	143,532

#### **5. Closing Reserve Fund Balance**



➤ The EFCE reserve position will be reduced to €100,000 as a result of 60<sup>th</sup> Anniversary activity and costs associated with the Information Officer



#### **PROGRESS REPORT - 3**

January 28th 2013

#### 1- NEWSLETTER3/COMMUNICATION

- N°2 focus on EFCE and best wishes send on 20 December
- N°3 Focus on ESBES in preparation to be send in March
- Research of contacts in Europe (to increase the mailing list)

#### 2 - SPONSORSHIP/EXHIBITION

- research of the next exhibitions or congresses (GL)
- research of clusters
- special proposal for Clusters and professional or research association in the sponsorship and exhibition book

#### 3 - ACROPOLIS/LOGISTICS

- rooms: tool to manage the rooms according to their size, the number of parallel sessions, the specific events (student day, ...) and the timetable of the congress
  - drawing for the placement of the pannels for posters in the exhibition space
  - plenary lecture in 'live' with Australia
    - it seems possible interaction with Twitter
    - need to increase the number of connections actually limited to 100.
    - Acropolis (technical part) in contact with Australia
    - cost to be estimated
  - gala diner
    - search of a location (carrying on)

#### 4 – SCIENTIFIC MATTERS

- meeting with the Chairmen of SFGP Working Groups (23 January Paris)
- presentation/discussion with the Chairmen of EFCE Working Parties and Sections (3 February)
  - for workshops and symposium : contact established with person in charge
- proposal of a list of persons (to be members of the scientific committee) (in progress)
- proposal of two people (one from SFGP, other external) to be topic managers (in progress)
  - topic and key word lists (in progress)
  - topics / key words / List of committees on web site in March
  - call for paper : opening in April

#### 5 – MEETING SFGP/ESBES/EFCE (general organization)

- scheduled on 7 February (videoconference)

#### Martine POUX

General Coordinator

**Nicolas ROCHE** 

Coordinator

10<sup>th</sup> European Congress of Chemical Engineering 3<sup>rd</sup> European Congress of Applied Biotechnology 5<sup>th</sup> European Process Intensification Conference Including 15th Congress of the French Society of Chemical Engineering

# ECCE 10 + ECAB3 EPIC5

September 26th - October 1st, 2015

ORGANISED BY







ORGANISATION SECRETARIAT







# SFGP - French Society of Chemical Engineering

- Created in 1988 by Prof. J. Villermaux from Nancy
- 17 working groups
- 600 members from academia (75%), industry (15%). and equipment manufacturers (10%)
- In 2012, members from industry represent 30 companies (chemicals, petroleum, energy, environment, pharmacy, process safety...)
- Involved with the EFCE for a long time (founder of EFCE)
- EFCE secretariat shared with IChemE and Dechema
- SFGP President: J-Pierre Dal Pont
- SFGP Governing board: composed of 30 members (shared equally between academics and industrialists)









#### **ORGANIZATIONAL CHART** ECCE10+ECAB3 EPIC5

Martine POUX - General coordinator **Nicolas ROCHE - Coordinator** 

> Organizing committee

Joelle Aubin

**Denis Bouyer** 

Michel Cabassud (EPIC)

Christophe Dagot

Franck Delvigne (ECAB)

Eric Favre

Philippe Jacques (ECAB)

Jack Legrand

**Martine Poux** 

Nicolas Roche

Steering committee





General logistics Communication



R. Gani - EFCE

G. Ferreira – ESBES

J. Glassey - ESBES

D. Brown - EFCE

W. Meyer - EFCE

P. Tanguy - WCEC

M. Poux - ECCE10

N. Roche - ECCE10

N. Dupeux – GL Events

ECCE10 - J.M. Le Lann

ECAB3 - G. Ferreira

EPIC5 – J.Brunelle /C. Gourdon

SYMPOSIUM/ WORKSHOPS

JP Dal Pont - SFGP

M. Soulas - GL Events

coordination:

E. Zerzaihi - GL Events

com. : M. Poux with EFCE/

ESBES/SFGP







www.ecce2015.eu



"Chemical Engineering and Biochemical Engineering for a new sustainable process industry in Europe ">>

ECCE10+ECAB3
EPIC5

# Scientific topics

# 4 KEY SCIENTIFIC TOPICS 1 GENERAL TOPIC

from key fields identified
by economists
(environmental preservation,
energy conservation,
human health protection)

core chemical
engineering and
biochemical engineering
topics

Energy: new and unconventional resources, conservation and management

Water Management and Treatment

Biotechnology and Food

Industrial Ecosystems

EFCE working parties and sections ESBES sections SFGP working groups

ORGANISED BY







www.ecce2015.eu







**WG Particulate Solid** 

**WP Agglomeration** 

**WP Characterisation of particulate Systems** 

WP Comminution and classification

**WP Crystallization** 

**WP Drying** 

WP Mechanics of particulate solids

**WG Life Cycle and material recycle** 

**Section Sustainability** 



workshop/symposium

**WG Education** 

**WP Education** 



workshop

**WG Food and Biotechnology** 

**Section Food** 

**European Society of Biochemical Engineering Science (ESBES)** 



ECAB3

**WG Polymer Engineering** 

WP Polymer reaction engineering

**WG Process System Engineering** 

**WP Computer Aided Process Engineering** 

**WG Product design** 

**Section Product design and Engineering** 

**WG Thermodynamics** 

**WP Thermodynamics and Transport Properties** 



workshop









**WG Safety** 

WG Reaction Eng. & intensification

**WG Separation** 

**WG Material engineering** 

**WG** Innovation

**WG Industrial Systems** 

WG Treatment of waste sludge, contaminated sites

WG Water and air treatment

**WG Energy** 



WP Loss prevention and safety promotion

WP Chemical Reaction Engineering WP Process intensification

**WP Mixing** 

WP Multiphase flow?

WP Fluid separation Section Membrane Engineering WP Multiphase flow?

**WP Electrochemical Engineering** 

WP High pressure technology WP Static electricity in industry



EPIC5



workshop







1001011	EFCE WP or section	Title	contact	Form/comments
	Process intensification	EPIC5	J-Pierre Brunelle Michel Cabassud	Congress in // 2 days
	Section on Sustainability	Symposium ? workshop ?	Adiza Azapagic Michael Narodoslawsky	2 days event on 1st day and a half: - 2 keynotes (one from academe and another from industry) a session to showcase the Section's achievements (on 2nd day) - round table discussion called EFCE Future Round Table" (2nd day afternoon)
	Education	Workshop	Martin Pitt Rafiq Gani	special "invited" session on education - slot of 150 min (4 invited speakers and the last 30 min would be spent as a panel discussion)
	Thermodynamics and transport properties	Workshop	I. Economou Jean-Charles de Hemptinne	- presentation of a major international project (EC FP7 Framework Programme) on CO2 Storage - few technical sessions
	Electrochemical Engineering	Workshop	Manuel Rodrigo Alain Bergel Karine Serrano	
	CAPE	Session or workshop ?		
	New WP Quality by Design	Session or workshop ?		





#### Next steps

- + relation between SFGP WG and EFCE WP > JM. Le Lann
- + relation with ESBES sections
- + Proposal of a list of persons (to be members of the scientific committee) > end Feb.
- + Proposal of a list of key words
- + Proposal of two people (preferably one from SFGP, other external) to be topic managers







+ proposal for Committees

- acceptation/final list

+ call for papers

+ abstract acceptation / notification

+ full texts

+ full texts acceptation/notification

-> march 2014

april 2014->nov 2014

feb 2015

april 2015

june 2015





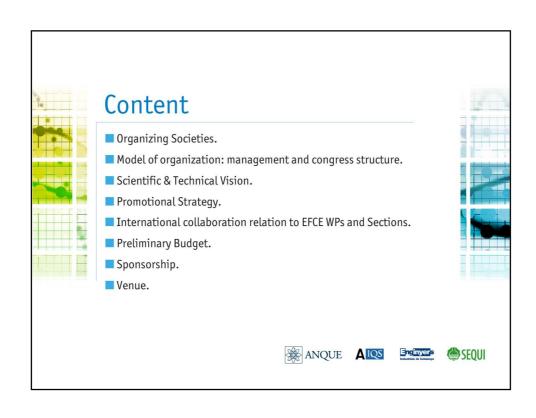


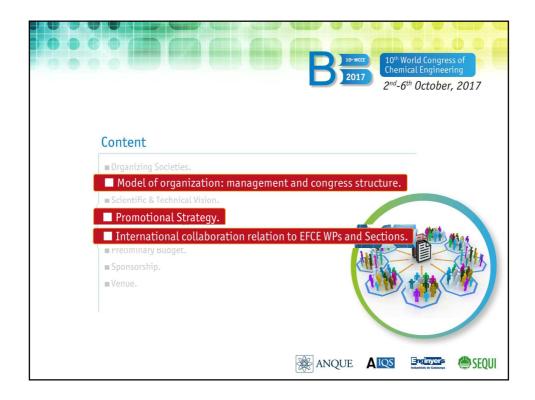






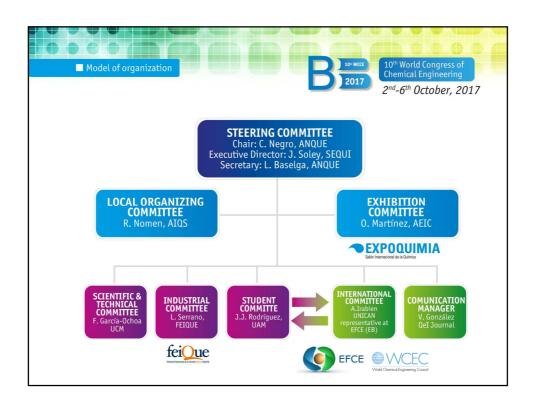


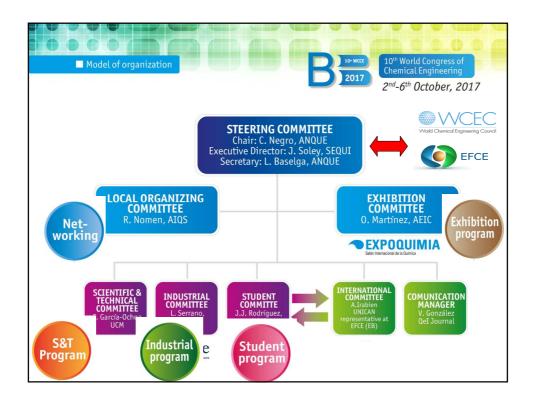
























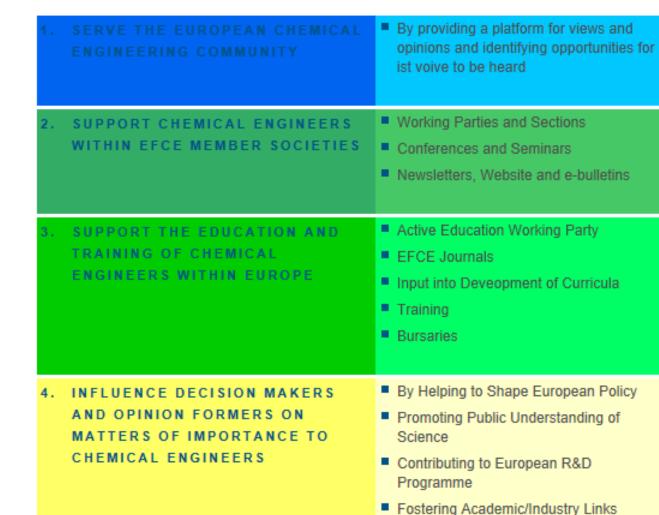




#### **EFCE**

#### Mission, Services & Initiatives





5. INITIATE COLLABORATION IN

FOR THE ADVANCEMENT OF

SCIENCE AND TECHNOLOGY

SUPPORT OF COMMON GOALS AND



## **EFCE Mission Statement**

SpottingBringing People Together via Respected

Proactive Horizon Scanning and Topic

 Bringing People Together via Respected European Technical Networks

#### The mission of the EFCE

- How to achieve them?
- Appendix 10 (continued)

- 1. Serve the European Chemical Engineering Community
- Support Chemical Engineers within EFCE member societies
- Support the education and training of chemical engineers within Europe
- Influence decision makers and opinion formers on matters of importance to chemical engineers
- 5. Initiate collaboration in support of common goals and for the advancement of science and technology

- The Working Parties & Sections
- The EFCE member societies
- The EFCE executive board members
- The EFCE secretariats
   (the services provided in terms of administrative, financial, public relations, meetings, awards, ....)

# Appendix 10 (continued)

#### **Some Questions!**

- How do WP's and sections perceive EFCE? Or, how can the EFCE help WPs, sections and Member Societies?
- What do you expect from the EFCE ?
- What type of management would you like for the EFCE? What extra services?
- How to attract industrial representatives? Lobby at EU?
- Are you a member of the EFCE group in LinkedIN?
- Do you receive the EFCE newsletter? If yes, do you read it and distribute it?
- Should the EFCE have membership activities for students? If yes, at what level?
- Is it necessary to create new fields of interest in ChE?

#### Initiatives: 2014 - 2015



#### **Chemical Engineering Community Level:**

 Scientific Panel for the Status-Vision of ChE (February 2014 – December 2015) – Members from European industry & academia

#### **EFCE Level:**

- Committee for establishing an EFCE Student Platform (February August 2014): members (3 from current EB + co-opted members)
- Committee for Public Relations-Visibility (February 2014 December 2015): members (one from each of the 3 secretariats plus co-opted members lead by Mike Considine, EFCE-VP)

#### **Projects Level:**

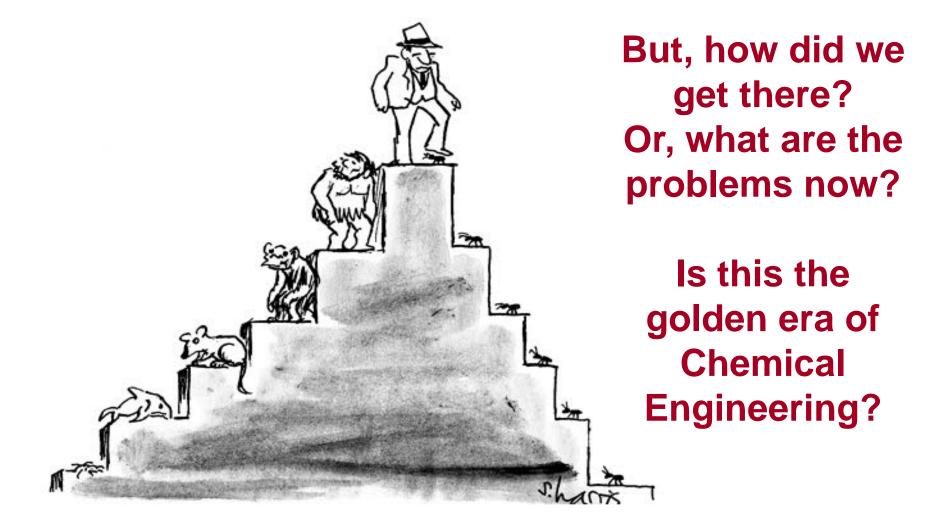
 Vision & Structure of future ECCE/ECAB events: members (EFCE President and EFCE VPs plus co-opted members)

#### **EFCE Forum Follow-up:**

Define next steps in terms of EFCE action in Education; Bio; Sustainability
 & Innovation (Jean-Marc LeLann, EFCE-VP)



#### Humans are the master of this earth



### Something for the Panel to consider!



Paradigm is a constellation (of ideas) that defines a profession and an intellectual discipline

Paradigm Shift points to a change from one way of thinking to another. It's a revolution, a transformation, a sort of metamorphosis. It just does not happen, but rather it is driven by agents of change.

Has Chemical Engineering reached such a stage? If yes, by what agents of change?