Fawcett Center for Tomorrow

Monday November 3, 2008

9:00 a.m. to 4:00 p.m.

Abstracts and Biographies

GMIC Introduction - Building a Sustainable Global Glass Industry

Michael Greenman, Executive Director GMIC
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Abstract

Sustainability is defined in many different ways. We'll look at several, both within and outside the glass industry, and introduce the day's speakers who will address a number of the elements of our industry that contribute to sustainability. If pursued actively, and in collaborations on a global basis, these elements will contribute to ensuring the continued and growing success f our industry as the manufacturer of products that lead to our own sustainability, and to improved sustainability of society and the environment.

About the Speaker

Michael Greenman is the Executive Director of the Glass Manufacturing Industry Council (GMIC). He came to GMIC in 1998 from Carr Lowrey Glass Company in Baltimore, Maryland, where he was Manager of Special Projects. In that capacity he was a member of the Glass Industry Team that worked with the Department of Energy's Office of Industrial Technologies to develop a glass industry vision and the industry roadmap.

Michael did his undergraduate work at Carleton College in Northfield, Minnesota and earned a degree in Romance Languages from the University of Minnesota. He has fluency in several languages.

Michael's professional career prior to entering the glass industry covers 9 years in the U.S. Navy where following service in a number of locations including Iceland and Cuba he resigned his commission as a Lieutenant in Public Affairs. 20 years in the international business with Caterpillar and John Deere followed with assignments to South America, the Far East, Europe, Africa and the Middle East. This was followed by a period as Executive Director of a London-based fund management firm. Previous experience with non-government organizations included the Executive Directorship of a London Third World Development Organization and of a Brussels, Belgium based International Business Network.

Technology Challenges the Glass Industry is Facing Now and in the Future

John Brown, Technical Director GMIC
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Abstract

The Glass Industry faces many challenges: energy prices are rising and availability will be coming into question; our melting technologies, while there have been improvements, still use too much energy and capital costs are too high. While reductions have been significant, emissions of greenhouse gases still are a concern. Glass itself is too heavy and brittle for many applications and there are concerns regarding availability of educated personnel for the industry's future needs. All of these will need to be addressed if we are to become a truly sustainable industry able to supply ever better products to supply humanity's needs.

About the Speaker

John Brown retired in 2002 after 40 years with Corning. He had broad experience in corporate engineering, development, and fundamental research. John was instrumental in introducing oxy-fired furnace technology around the world as this new technology moved towards general acceptance. For the past 6 years John has been Technical Director with GMIC, continually encouraging our members and the industry as a whole to seek ever better technology solutions to improve our sustainability. Among many other responsibilities, he served as technical adviser to the Submerged Combustion Melter project that brought together five competitive companies to develop this "game-changing" technology. He has over 50 published papers, and was awarded 18 patents in the fields of glass, energy, and combustion. He was the 2005 awardee of the highly respected "Phoenix Award" for significant contributions to the glass industry.

Technology Developments for Glass Melting Processes, Energy Efficiency, Benchmarking, Waste Heat Recovery and Glass Recycling in Europe

Prof. Dr. Ir. Ruud Beerkens (TNO Science and Industry, Senior Scientist)
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Abstract

The presentation will give a brief overview of the European glass industry and the main concerns today driven by CO_2 emission reduction targets, new regulations on emissions (IPPC), increasing energy and increasing raw material costs. Although many technologies have been applied in the glass industry in order to decrease energy consumption, such as processing of cullet to be recycled, batch & cullet preheating, better insulated glass furnaces exist for many years (e.g. batch preheating is applied in EU since 1987), new developments are necessary to cope with the new regulations and energy efficiency targets (20 % energy efficiency improvement in next 12 years in some countries). Apart from this, the glass industry in Europe (EU, with 27 Member States) faces new regulations concerning the use and production of chemical substances and preparation (REACH) and trading of CO_2 emission permits, with a fast increasing shortage of these permits on the market.

The paper will show the use of energy in the glass industry and the energy saving methods with their potential. Benchmarking studies identified the best (energy efficiency) practice, and even when approaching this best practice (per sector) for all glass furnaces in each sector this would give 10 up to 15 % average energy savings for glass melting. Beyond that energy saving level, new technologies have to be developed. A new research program will be initiated with European and non-European partners to develop:

- New glass melting concepts with fast batch melting and (re)fining;
- Tailored raw materials batches to increase melting rates or decrease chemical energy demand;
- Innovative ways of flue gas heat recovery for regenerative and for oxygen fired furnaces
- Development of sensors for glass melts and combustion analysis in combination with advanced process control systems.

The target is energy savings of more than 20 % (on average) plus reduction in NOx emissions, with a combination of the above mentioned approaches.

Important issues for waste glass recycling (post-consumer glass waste), especially for furnaces using more than 50% cullet will be discussed. The two most important issues are the costs and supply of high quality cullet in some EU countries such as UK and the Netherlands and the removal of contaminants in cullet such as glass-ceramics.

About the Speaker

Ruud Beerkens started to work on Glass Technology in 1982. In 1986 he received a PhD on the chemistry of flue gases from glass furnaces at the Eindhoven University of Technology in the Netherlands.

Between 1986-2001 he worked at TNO in the field of modeling of glass melting processes, energy and environmental aspects of glass production, thermo-chemistry of glass, fining and refractory behavior.

In 1997 (until 2003) he started as part-time professor at the Eindhoven University of Technology. In the period 2001-2003 he was department leader of the glass technology group of LG Philips Displays.

In spring 2003, he went back to TNO in the Glass Group as senior scientist. He became TNO Senior Research Fellow in June 2005.

Current Activities: Consultant for EU and Netherlands glass industry sector, chairman of TC 18, Glass Trend, member of ICG Coordinating Technical Committee, Senior Scientist at TNO, member of several advisory boards, Founder and chairman of Glass Trend. Working for more than 30 glass companies world-wide on a regular basis.

CO_2 Emissions Trading in Europe and Possible Alternative Approaches

Guy Tackels – (Saint Gobain) – Environmental Director for Glass Melting
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Abstract

The European Union currently has a CO_2 emissions trading program in place. It presents a number of problems from the perspective of the glass industry. Mr. Tackels will describe the current "Cap-and-Trade" program and its challenges for our industry and suggest possible alternative approaches that could be considered in the United States and potentially in other areas.

About the Speaker

Guy Tackels is Environmental Director of Glass Melting for the Saint Gobain Corporation. He is also President of the Environmental Committee of the CPIV ("Comité Permanent des Industries du Verre Européeenes" – or – "Standing Committee of the European Glass Industries") as well as of the Fédération Française du Verre.

Glass & Environment: Spreading Good News

John Stockdale – Environmental Manager, British Glass Manufacturer's Confederation
Email: j.stockdale@britglass.co.uk

Abstract

It is an exciting and challenging time to be in the glass industry. On the one hand we have a material which is thousands of years old and is for the most part essentially made in the same way as it has always been i.e. using comparatively large amounts of fossil fuel. On the other hand we have developed products that reduce energy consumption, help generate low carbon energy and are recyclable and reusable. Our fossil fuel consumption is problematic because governments and environmentalists class us as an energy intensive industry and that means that in the fight against climate change we are increasingly subject to expensive constraints: not to mention rising energy prices. On the other hand unless scientific research comes up with some blue sky materials or processes, the bulk of the products we make and indeed the highly specialist applications being developed, will have a major role to play in exactly the areas that governments and environmentalists are trying to encourage: that is reducing energy consumption, generating low carbon energy and conserving resources through the use of recycling and reuse.

In those countries that are already imposing carbon constraints, governments are only too aware that carbon leakage, the loss of production to regions which have yet to impose carbon constraints, is a real threat. New cost differentials could hasten the hemorrhaging of own-country production as has already occurred in many higher product value sectors. It can be argued that not only do producers in non carbon constrained countries avoid being beaten by the climate change stick; off-shoring production also increases the environmental impacts of infrastructure and transport thus counteracting the home nation initiative. It may also have significant societal implications. Another problem on the horizon is that without compensatory mechanisms increased product costs could hinder market penetration of the very products that governments want to encourage.

There is therefore for the glass industry an inherent conflict within the climate change initiative and those whose objective is to encourage true sustainability. Unfortunately there is little evidence to indicate that this dilemma is being successfully addressed. Many believe that we are a long way from getting joined up thinking in such environmental matters and who if not the industry will play the key role in informing policy makers, government officers and regulators and indeed the general public about the glass industry and its products. In a world where the credentials of all products are increasingly coming under scrutiny it is essential to communicate the true balance between environmental production costs and environmental product benefit. Glass has a good story to tell but it has until now been largely taken for granted. The International Commission on Glass recognizes that in order to turn the situation around better communication is one of the 21st challenges. This presentation explores the problems and the potential ways forward.

About the Speaker

John Stockdale is Environmental Manager to the British Glass Manufacturers' Confederation based in Sheffield. Within British Glass he is secretary to the industry Environment and Energy Committee, the industry EU Emissions Trading Working Group, the Climate Change Agreement Supervisory Board and Integrated Pollution Prevention and Control working group. He also

represents UK glass interests at the EU trade association level. He is involved in many environmental issues and in particular the negotiations with government and regulators on the development and implementation of climate change initiatives and their impact on the glass industry. He is currently a Director of the UK Emissions Trading Group Ltd, an advisory body on emissions trading and previously chair of its working group on Competitiveness. He holds a Science Degree and a Masters in Environmental Technology from Imperial College London.

Keynote Speaker – "Resilient Today Sustainable Tomorrow"

Dr. Joseph Fiksel – Director, Center for Resilience OSU)
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Abstract

The accelerating pace of globalization and technological change means that businesses confront an increasingly complex and turbulent environment. Resilient enterprises seem to thrive on turmoil – they adapt to disruptions, discern opportunities to seize competitive advantage, and consistently build shareholder wealth. According to the U.S. Council on Competitiveness, improved resilience is a critical success factor for U.S. industries competing in the global economy.

Enterprise resilience is defined as "the capacity to survive, adapt, and flourish in the face of turbulent change". Building a resilient enterprise involves many elements, including talented and versatile employees, an agile supply chain configuration, effective planning and decision processes, and strong relationships with suppliers and customers. Resilience is not just a strategy or a skill, but a measurable attribute of a company's assets, including technology, capital, people, products and processes.

Resilience is sustainability in real time. Put another way, resilience in the current business environment is a prerequisite for achieving long-term sustainability. By making the right strategic choices today, a company can position itself to compete effectively and avoid painful disruptions in the future. Companies can learn from the resilience characteristics of living systems – a balance between autonomy and control, and a keen ability to sense and respond to threats.

The forces that companies are grappling with today include increasing geopolitical volatility, dwindling environmental resources, and mounting stakeholder pressures. Responding to these forces will require both internal innovation and external engagement. Perhaps the most urgent imperative is developing a coordinated strategy for reducing global warming emissions and for adapting to climate change.

The speaker will discuss examples of respected companies that excel at resilience and sustainability.

About the Speaker

Dr. Joseph Fiksel is Executive Director of the Center for Resilience at The Ohio State University, and Principal and Co-Founder of the consulting firm Eco-Nomics LLC. He is an internationally recognized authority on sustainable business practices, with over 25 years of research and management consulting experience for multi-national companies, government agencies and consortia such as the World Business Council for Sustainable Development. A native of Montreal, Joseph began his career at DuPont of Canada, and subsequently was Director of Decision and Risk

Management at Arthur D. Little, Inc. and Vice President for Life Cycle Management at Battelle. He has published over 70 refereed articles and several books, and is a frequent invited speaker at professional conferences.

Activities by the International Commission on Glass on Behalf of the Global Glass Industry

Rene Vacher – Professor, University of Montpellier)
Email: rene.vacher@lcvn.univ-montp2.fr

Abstract

The International Commission on Glass (ICG) is actively attempting to help the industry to evolve through a number of programs and initiatives. Its CTC (Coordinating Technical Committee), R&D clusters, and the Technical Committees themselves, are seeking to improve the industry's technical and environmental effectiveness on a broad number of fronts. EFONGA - European Forum on New Glass Applications – is coordinating pre-competitive research work throughout the European Union that will improve glass technology across a broad range of specialization areas concerning glass production and applications. Programs are being considered to expand the focus beyond the European nations to include other key areas of glass industry significance.

About the Speaker

Dr. René Vacher is a Professor at the University of Montpellier in Montpellier, France, and Vice-Chair of the Coordinating Technical Committee of the International Commission on Glass

The MatWerk Roadmapping-Project – Developing a Strategy for Materials Science in Germany – Preliminary Results for a Glass Materials Roadmap

Klemens Joachim – Research Associate, University of Kassel
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Abstract

The development of long-term strategies (e.g. roadmaps) for materials is gaining importance for the materials community around the globe. Latest examples include EU technology platforms like SusChem, EuMat, and MatUK as well as the increasing use of roadmaps in private companies. Furthermore, there is a wide range of roadmapping activities in fields that often depend highly on materials research - e.g. nanotechnology, automotive, health-care.

The presentation will give an overview on preliminary results of a roadmapping project funded by the German Research Society. It aims to establish a roadmapping process for materials science in Germany. One aim of the project is to uncover the future potentials of different technologies in the field of research on glass materials. U.S. Glass companies and others have participated in this effort.

About the Speaker

Since 2006 Klemens Joachim has been a research associate at the Department of Innovation and Technology Management of Kassel University (Germany). His research interest is in the field of technology intelligence and planning. He is engaged in establishing roadmaps and strategic research agendas for the field of materials science. Mr. Joachim earned his master degree of international business studies and international economics at the University of Paderborn (Germany) and the Athens University of Economics and Business (Greece). Previous to his employment at the university he gained experience in a technology oriented consultancy firm and as freelance tutor for adult education.

Glass Users – Panel Discussions

Energy Productivity – Our Greatest Threat or Biggest Opportunity

Peter Garforth – President, Garforth International
Email: garforthp@cs.com

Abstract

Barely a day goes by where energy is not making the headlines. Energy prices rise and fall with alarming rapidity, all too often ending higher rather than lower, together with growing fears over energy availability and environmental devastation. The changes in energy are transforming the competitive make up of industry around the world. This talk will explore the threats and opportunities these changes bring to business in general, and to our industry in particular. Examples of companies that have built major competitive advantages by tackling energy and climate change challenges as strategic management issues will be explored, along with some thoughts on what all this means to the glass industry's priorities going forward.

About the Speaker

Peter Garforth, runs a specialist consultancy based in Toledo, Ohio, and Brussels, Belgium. He advises major companies, cities, communities, property developers and policy makers on developing competitive approaches that reduce the economic and environmental impact of energy use. He has held senior management roles around the world at Honeywell, Landis & Gyr (now Siemens) and, most recently, was vice-president of Strategy for Owens Corning, the largest US manufacturer of insulation and other materials.

Peter has long been interested in energy productivity as a profitable business opportunity and has a considerable track record establishing successful businesses and programs in the USA, Western and Eastern Europe, Indonesia, India, Brazil and elsewhere. He was the co-chairperson of the International Advisory Committee of the Alliance to Save Energy in Washington, D.C., a founding member of the European Business Council for a Sustainable Energy Future, a member of the Steering Committee on Energy Efficiency Financing of the Russian Federation, and Chairman of the

International Institute for Energy Conservation. He is also past President of the Board of Trustees of Toledo Opera.

Vision(s) for the Glass Industry - Possible Alternative Futures 2002 - "The Good, The Bad, and the Ugly"

Warren Wolf – President, WWW Jr. Services
Email: wwolf@insight.rr.com

Abstract

I was asked to talk about directions for the glass industry, adapting for future realities and opportunities for the glass industry to survive and thrive. I decided to do this by looking back at a talk I gave here just over six years ago called "Visions for the Glass Industry/Possible Alternative Futures 2002-The Good, The Bad and The Ugly". What has happened in last six years and what does the future now look like 16 years further out toward 2022. Is it looking more good, more bad, or is it just plain ugly?

About the Speaker

Warren Wolf retired from Owens Corning on August 16, 2001. He was named Vice President, Owens Corning Science and Technology in 1998. In 2000 the title of Chief Scientist was added. He had a long career with Owens Corning spanning 33 years as both a senior scientist and then technical management positions in research, engineering and environmental and health science areas with considerable involvement in manufacturing. He holds 15 patents in the areas of glass fiber process and composition and has received special awards from Owens Corning for his patent contributions as well as a lifetime achievement award upon his retirement. Since his retirement Dr. Wolf has continued an active career in the areas of glass and ceramics. He has served as President of The American Ceramic Society, 2005 -2006 and serves on Advisory Boards at Virginia Tech, Materials Science and Engineering Dept., and The Ohio State University, Center for Resilience in College of Engineering. He has consulted among others for The United States Department of Energy on energy efficiency and nuclear waste issues as well as for The Glass Manufacturing Industry Council/GMIC where he is an Emeritus member. He was a US delegate to the International Commission on Glass (ICG) and served eight years. He chaired the ICH Technical Committee on the Biosolubility on Glass from its founding until completion of research work showing glass fibers should be not be listed among carcinogenic materials. Wolf was honored in 1997 by presenting the Arthur L. Friedberg Lecture at the annual meeting of the American Ceramic Society. In 2003 he received the Greaves-Walker Award from NICE for service to the field of ceramic engineering. He has also been honored as a distinguished alumnus of the College of Engineering at Ohio State and as a Fellow of the College of Earth and Mineral Sciences at Penn State, The American Ceramic Society and The National Institute of Ceramic Engineers. Wolf earned a bachelor's degree in ceramic science from The Pennsylvania State University in 1963, a Ph.D. in ceramic engineering from The Ohio State University in 1968, and an MBA from Xavier University in 1977. In 2006 Wolf received the Glass Industry's Phoenix Award which is given globally to one individual each year for their achievements and contributions to the glass industry.