



And the nominations are...

... announced for this year's ICIS Innovation Awards. Thirteen entries are short-listed, with the winners to be announced in October.

JOHN BAKER/LONDON

IN HARSH economic times, innovation spend inevitably comes under pressure. But, judging from the record number of entries to this year's ICIS Innovation Awards, it also comes into greater prominence, as companies seek to ensure their long-term sustainability.

The Awards, again sponsored overall by US silicon technology company Dow Corning, and global consultancy CRA International joining for the first time as sponsor for the Best Innovation category, are now in their sixth year, and are proving as successful as ever in showcasing the best the chemical industry has to offer.

Innovation continues to be a key priority for chemical companies. With new players entering the global market and with continual pressure on costs and mar-

gins, there is a tremendous drive for firms to come up with new products, processes and service offerings.

Effective innovation – the turning of ideas into profitable business activities – calls for research and development to be aligned with other functions in the enterprise, notably sales, marketing and manufacturing. It can be boosted through collaboration with customers, academia and even other companies.

On the following pages, we describe the best of this year's entries – the ones the panel of eminent judges has selected for the short list. These will go on to a second round of judging later this month, and the winners in each category will be revealed in a special 12-page supplement to *ICIS Chemical Business* on October 19.

This year, for the first time, we will be choosing an overall winner, selected from the

four category winners. This will be presented by Dow Corning as lead sponsor of the ICIS Innovation Awards. I am confident that you will find the short-listed entries up to the usual standard, and I hope they will prompt fresh thinking and sustained, if not renewed, efforts for innovation across the sector.

Once again, many – if not all – of the entries have a common theme of sustainability and environmental improvement. It seems these concepts are at last being hardwired into the innovation process and the decisions on whether to develop specific projects or not.

The main goals of the awards are to stress the importance of innovation to the chemical industry and its sustainable future, and to celebrate its achievements. I look forward to meeting the people behind the winning entries when we celebrate their success at an awards ceremony and luncheon in London.

BEST PRODUCT INNOVATION

Arkema/CECA

Gilles Barreto

Formulations for "greener roads"

Surfactant formulations developed by the CECA subsidiary of French chemical company Arkema reduce energy consumption during road construction and improve working conditions and the environmental impact of emissions of dust, volatile organic compounds and nitrous oxides. They achieve this through control of the bitumen/aggregate interface structure in the asphalt, allowing it to be laid on the road at much lower temperatures. Other important properties and the productivity of the construction process are retained or improved, and the amount of recycled asphalt in the mix can be increased.

Lucite International

Neil Sayers, David Johnson, Graham Eastham, Neil Tindale, Neil Turner, Mark Jelpke and Roy Goulder

Alpha technology for production of methyl methacrylate (MMA)

UK acrylic products firm Lucite International has developed and commercialized a novel process route to MMA that has the potential to realize cost savings of more than 40% compared with existing processes. The *Alpha* process uses readily available feedstocks, eliminates inventories of toxic and corrosive materials, and minimizes production of effluents and by-products, thus virtually eliminating waste treatment costs. Lucite had to develop two new highly selective and active catalysts and a novel separation process to



CULTURE OF INNOVATION



Society tends to hold innovators in high esteem. Many of the breakthrough technologies and innovative ideas that benefit society are linked strongly in the public mind with the achievements of a single individual.

Think of Alexander Graham Bell and Thomas Edison, or some of the innovation heroes of today – people like James Dyson or Tony Fadell, who have changed the face of household appliances and digital devices.

These are people who are passionate about discovering something new; who constantly challenge themselves to try different approaches and are unflinching in their determination to succeed.

But innovation doesn't happen exclusively as a result of endeavor by one person. It can happen within a team, a business unit, a whole company. Think what is possible when the energy and knowledge of a whole enterprise is unleashed and all employees feel empowered to think differently about a process, product or service.

Creating that culture in a company doesn't happen overnight. It takes leadership commitment, a clear strategy and the right process models. But when those are in place, innovation can become contagious and self-perpetuating. That's been our experience in creating a culture of innovation within Dow Corning.

It's clear the companies that entered the ICIS Innovation Awards share our passion for thinking differently about business opportunities and challenges. It's that spirit of imagination and ingenuity that will ensure our industry thrives.

Dr. Stephanie Burns
Chairman, president and CEO
Dow Corning



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realize the process, which is now in use in a 120,000 tonne/year plant in Singapore.

Genencor/Goodyear Tire and Rubber Jesse Roeck, David Benko, Michael Arbige, Karl Sanford and Richard LaDuca *BioIsoprene*

Genencor, a division of Danish bio-based ingredients producer Danisco, and US tire manufacturer Goodyear began a collaborative effort to develop an alternative bio-route to isoprene in 2008, to reduce dependence on the petrochemical product potentially in very short supply. Genencor has engineered an *E. coli* bacterium to produce isoprene in high yield, while Goodyear has designed an economical recovery process to produce polymer-grade isoprene. The key is production in the gas phase which leaves the culture medium free of the product at all times, avoiding the toxic effects of product buildup. The market opportunity for *BioIsoprene* is estimated at over 770,000 tonnes/year.

Arkema/ESPICI/CNRS Manuel Hidalgo, Ludwik Leibler and Francois Tournilhac

New materials derived from supramolecular chemistry

The heart of this entry is an innovative polymer based on reversible intermolecular bonds, in particular, hydrogen bonds, instead of, or in addition to the usual covalent or ionic crosslinkers in polymers. By controlling this type of bond and its strength, a whole new class of elastomers and rubbers can be achieved, notably with "self-repairing" properties. The hydrogen bonding is introduced by using special functional additives such as aminoethyl imidazolidone and fatty acid dimers and trimers. Products are being commercialized under the trade name *Reverlink*.

BEST INNOVATION BY AN SME

Genomatica Christophe Schilling and Mark Burk Sustainable chemicals from renewable feedstocks

California, US-based Genomatica devises novel bio-manufacturing processes to several industrial petrochemicals from plant sugars, notably 1,4-butanediol and methyl ethyl ketone (MEK). It uses both computational modeling and wet lab processes to develop each process, focusing on the most efficient biochemical path from sugar to end-product. It then genetically engineers specific microorganisms to produce the chemicals. The processes require less energy

and lower capital investment and use renewable feedstocks, which offers a more diversified starting point for production.

Oxford Catalysts/Velocys Derek Atkinson

A microchannel reactor for the distributed production of third-generation biofuels

Production of liquid biofuels from waste feedstocks, including municipal waste, sounds attractive but the need to transport large volumes to a central facility is not environmentally sound. The UK's Oxford Catalysts and its US subsidiary, Velocys, have developed a small-scale *Fischer-Tropsch* reactor and highly active catalyst that enable production of bio-fuel in situ, when processing just 500–2,000 tonnes/day of waste. Productivity in the micro-channel reactor is high and diesel and jet fuels should be economic to produce while oil is over \$50/bbl. A pilot-scale unit has been built at Plain City, Ohio, US.

Rahu Catalytics/OM Group Ronald Hage, Philana Wesenhagen, Hugh Gibbs and Franjo Gol

Novel paint-drying technology

UK-based Rahu Catalytics has developed an iron-based catalyst complex that can be used to replace the costly and environmentally problematic cobalt carboxylates often used as drying agents in alkyd coating formulations. Originally developed as a stain bleach catalyst, the new oxidative drying technology is being used by US specialty chemical maker OM in its Borchers coating additives range on an exclusive, global basis. The FeONIX complexes have been proven in conventional, high solids and water-based products. They can also be used in inks and as polymerization additives for composites.

LH Aviation/DSM

Sebastien Lefebvre, Matthieu Billet, Christophe Bourban, Ben Drog, Ron Verleg and Jasper Bouwmeester Light aircraft development supported by a new class of material

France-based LH Aviation has developed a light aircraft that uses Dutch specialty chemical company DSM's *Aeronite* Turane resin in place of traditional epoxies used in reinforced composites. The resin – a novel thermosetting polyurethane (PU) created with a radical polymerization process – shows equivalent performance but can be used in a closed-mould process at room temperature. This eliminates emissions and provides a safer

workplace. The investment threshold is also reduced as autoclaves are not required – a vacuum-infusion process is used instead.

BEST BUSINESS INNOVATION

DSM Innovation Centre

Remko Goudappel and Inge Massen

Moving down the value chain with *claryl* – the picture glass

Having invented a one-step optical anti-reflective coating for float glass, Dutch specialty chemical maker DSM decided that instead of marketing the coating, it would enter the market itself with a branded mid-priced picture-framing glass to capture more of the value from the innovation. Extensive market research indicated a gap in the market and the launch has been so successful DSM has had to install further capacity. The *claryl* picture-framing glass is now sold in 15 EU countries and a bid to enter the US market is underway.

PTT Polymer Marketing

Narongchai Pisutpunya

Export document system solution (Export Easy)

Thailand-based PTT Polymer Marketing has established a Centre of Excellence for Export and developed a fully electronic system to handle letters of credit and associated export papers and documentation. The Export Easy system enables exporters to convert letter of credit information from banks into full electronic format, using XML, that can then be linked with purchase order data and sent directly to shipping lines. It is claimed to make document preparation five times faster and to reduce human errors by 80%. It will save the petrochemical marketing arm of state-owned PTT around 25m baht/year (\$735,000/year).

BEST INNOVATION IN CSR

Tata Chemicals

Neti Satya Subrahmanyam, Jacob Mammen and Sanjay Choudhary

Greening of alkaline and saline sediments

Soda ash producer Tata Chemicals has reclaimed 22 acres (9ha) out of 30 acres of waste dumps near its site in Mithapur, Gujarat, India, to reduce dust generation that was affecting local inhabitants. For 20 years, the dust had been suppressed by spraying it with sea water, making the soil quality poor. Tata engaged The Energy & Resources Institute in Delhi, which identified the most suitable plants and developed a microorganism inoculation to help them extract nutrients from the poor soil. At the same time, Tata has

introduced filtration technology to end disposal of soda ash effluent into settling ponds.

Teijin Group

Rie Mashiba

Teijin Group Design for Environment guidelines

The environment, safety and health office at Japanese chemical company Teijin has established a system to evaluate all its production process lifecycles, from raw materials procurement, through production, sale and use, to recycling and disposal, using six main criteria. Teijin employees carry out the assessment globally, following checklists with 82 questions on feedstocks and 95 on finished goods. The program is part of Teijin's initiative to cut industrial waste by 85% and chemical waste by 80% over 1998 levels by 2020.

AIME consortium

Allan Laing (chairman of AIME)

Improving supply chain integrity

Members of the Agrochemicals and Intermediates Manufacturers in Europe (AIME) consortium within Cefic's European Fine Chemicals Group have developed and tested a unique set of voluntary guidelines and a business integrity evaluation (BIEN) toolkit. These are intended to improve supply chain integrity by combining the elements of ISO standards with business ethics to establish minimum requirements for non-current good manufacturing practice fine chemicals makers worldwide. Supply chain customers can use BIEN to evaluate supplier compliance with the voluntary guidelines using their own staff, rather than expensive auditors. ■

» For further information go to www.icis.com/awards or email john.baker@icis.com

THE JUDGES

Judging this year's record entries for ICIS are:

Dr. Neil Checker

vice president and head of the Europe & Middle East region for chemicals at CRA International



Paul Hodges

chairman of consultancy International eChem, which gives commercial advice to the industry



Robert Kirschbaum

vice president of open innovation at DSM, in the office of the chief technology officer



Dr. Gernot Klotz

executive director for research & innovation at the European Chemical Industry Council (Cefic)



Dr. Gregg Zank

vice president, chief technology officer and executive director for science and technology at Dow Corning



A word from Best Product Innovation sponsor



At CRA International, we believe that the long-term success of chemical companies will depend on the long-term investment in technology, and product innovation will continue to be a major differentiator for gaining competitive advantage.

The response to the ICIS Innovation Awards has been unprecedented, and confirms to us the long-term health and creativity of the chemical industry, despite the current business climate and the associated pressure on firms to maintain funding for innovation. CRA is proud to be a sponsor of this event, and we look

forward to recognizing the selected winners in October 2009.

Dr. Neil Checker, vice president, CRA International



INTERNATIONAL