

## New solutions to address the sustainability challenge

Delivering a UK chemical industry with dramatically improved sustainability within the next 20 years presents a diverse and formidable series of 'grand challenges'. Meeting them demands an innovative approach, with fresh thinking that steps well beyond the usual boundaries of conventionally-funded research programmes. Determined to generate new and exciting new green chemical technology projects, Chemistry Innovation - in partnership with EPSRC - has successfully harnessed the "sandpit" approach from which three exciting projects have emerged.

First developed by the Engineering & Physical Sciences Research Council (EPSRC), "sandpits" offer a dynamic approach to the collaborative development of concepts for innovative new projects.

The 'Green Chemistry' sandpit was run as a joint 2007 activity by Chemistry Innovation and the EPSRC, to trigger breakthrough thinking on sustainability.

Twenty academics from a range of chemistry, engineering and bioscience disciplines, were brought together for the workshop at the Royal Mail Innovation Laboratory in Rugby.

Delegates worked intensively over four days to develop project ideas that they would then carry out using funds provided by EPSRC for the most promising projects.

The group benefited from input by key industry speakers - sharing practical experiences - and a facilitation team from the Royal Mail Innovation Laboratory.

### THE SUSTAINABILITY CHALLENGE

A multimedia presentation set the scene by portraying life in 2050 as it could be if we do not take action on sustainability issues. Specific threats and challenges - incl. resource depletion, waste, environmental damage and rising energy consumption - were quantified by a team of experts.

Delegates ran a 'backcasting' exercise, creating imagined media reports from 2050, 2040, 2030, 2020 and 2010. Viewed from 2050, these showed mankind's action in avoiding the leading sustainability threats.

To make these threats more real, the group visited a local landfill site to see what our current wasteful society looks like.

The backcasting scenarios drove definition of the challenges that could lead to an alternative future for the chemical sector. Workgroups translated these into potential projects that were fine tuned through criticism and advice.

Each group developed outline project proposals for EPSRC funding, with available resources guaranteed against key projects, subject to completion of detailed project documentation.



### SANDPIT DELIVERS INNOVATIVE SOLUTIONS

Three exciting projects emerged from the Chemistry Innovation/EPSC sandpit process that **target completely new solutions for well-known challenges:**

- Engineering the convergence of chemistry and biology – developing ways to combine biological and chemical processing on a micro-scale.
- Intensified Integrated Bio-Refinery – maximizing the use of available biomass.
- C-Cycle - developing a sustainable carbon economy through efficient recycling of Waste materials

Total funding provided for these projects was **£1.8m**.

Crucially, the intensive and focused thinking by a multi-disciplinary team equally opened up new and exciting opportunities for all of the participants and led to projects that might otherwise never have been developed.

As of January 2008, all three projects are active and will have reportable progress during in 2008.