

## Technologically innovative fields with sustainable growth potential

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### Strategy

- Bringing together innovation and sustainable development, particularly in order to enter market segments with high and growing added value.
- Developing skills and collaborative ventures so as to investigate and exploit emerging opportunities.
- Ensuring our Future Businesses Competence Center is focused on contributions to sustainable development.



With flexible screens and OLED lighting panels, etc., printed electronics is making dramatic applications possible.

Printed electronics is now advancing on all fronts, as it becomes possible to produce electronic components on an ever-wider variety of support materials. Such "organic" electronic systems will soon be mass-produced, at lower cost, on rotary printing presses; and the development of OLED lighting components is opening the way to very bright prospects. They are cheap to run and sparing in energy consumption, while providing gentle and diffuse illumination. We can expect to see them very soon on the ceilings of our homes.

OLED technology is also making it possible to produce display screens with higher light levels and greater contrast. Most important, though, is that they will be much thinner than the ones we are used to, with the promise of poster-size portable televisions and mobile-phone screens that can be rolled up.

New sectors establish emerging opportunities for sustainable activities with high added value (see also page 40).

Solvay has identified organic electronics and sustainable energy as potential growth areas, based on disruptive innovation. Both areas can contribute to sustainable growth with high added value.

The research program on materials for fuel cells is a mainstream component of the sustainable development prospect. In particular, the investigations relate to increasing the reliability and reducing the cost of the membrane-electrode assemblies at the heart of the fuel cell. Radically new concepts for fuel cells are being explored in collaboration with partners in France, the UK and Germany. In this connection, Solvicore (a 50/50 joint venture between Solvay and Umicore) and Michelin have combined their efforts to develop a fuel-cell system for the HyLight 2 concept vehicle designed by Michelin and presented at the Challenge Bibendum event in Shanghai, in November 2007. The developments in organic photovoltaic cells come to complete the platform on sustainable energies.

The synthesis of organic materials and the formulation of ink intended for printed electronic devices in replacement of silicon-based, forms the second platform of our "Future Businesses" Competence Centre. In this framework, Solvay, Solvay Solexis and Thin Film Electronics ASA (of Norway) have pooled their efforts to optimize ferroelectric materials in order to obtain higher performance of thin-layer printed electronic memories.

Solvay is involved, through research contracts with Georgia Institute of Technology (USA) and a significant investment in the Plextronics company, with research aimed at greatly reducing the cost of solar cells, by replacing systems based on crystalline silicon with organic cells. The collaboration is also concerned with developing displays using organic light-emitting diodes (OLEDs) (see box).

We are currently developing new applications for products from our Chemicals and Plastics sectors: In health-related fields, biomaterials and medical equipment, products for disinfection, hygiene and cosmetic purposes, protective products for human and animal nutrition have been assessed as part of the monitoring and risk management provisions specific to these markets. In the field of micro- and nano-particles, NANOVIN® is a PVC specialty containing particles that modify the product's viscosity. Possible applications in the premarketing stage are motor-vehicle bodywork and artificial leather.

Application of the NOVOSOL® process to cleanse sediment contaminated by heavy metals and/or organic compounds (oils, pesticides, etc.) that has been dredged from waterways has now proceeded beyond the pilot stage. This is an outstanding example of an approach to industrial ecology, with recycling and the production of "secondary" raw materials. Two industrial projects are currently planned: one to treat sediments in Wallonia (southern Belgium) and the other in the industrial harbour of Venice (Italy), each for about one million tonnes contaminated sediments (see page 55) ■



### Fuel cells

In the beginning of 2006, during a research seminar held by Solvay Solexis in Bollate (Italy), Jacques van Rijckevorsel, General Manager of the Plastics Sector has driven the first urban car powered by a fuel cell engine. In the presence of the project team.

### Two major challenges for the pharmaceutical industry: greater safety and more-personalized therapies

There is an ever-increasing demand for more data and a trend towards having to demonstrate the safety and benefit of any new medicinal product when compared with an existing medication rather than a placebo; such are the strengthened regulatory requirements for the safety of pharmaceutical products.

The need for volunteers to participate in clinical trials will therefore increase. While the pharmaceutical industry's R&D spending has tripled over the past 10 years, the number of marketing authorizations for new compounds has fallen, obliging the industry to increase still further its efforts in research and innovation. At the same time, the move towards treatments that are more targeted, bringing together diagnosis and personalized therapy, is leading to the development of niche drugs rather than "blockbusters". Meanwhile, from a global perspective, there remains a need to respond to many medical conditions that are still waiting for effective treatments, but where development receives inadequate finance.

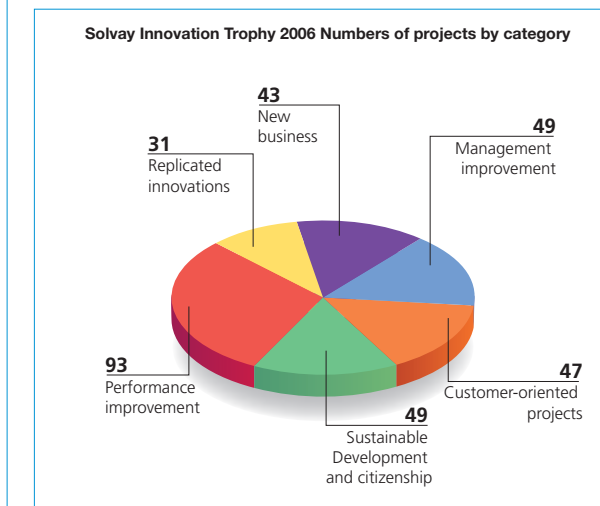


Increasing trend, despite a more strict definition.



### Innovation Trophee 2006, an excellent vintage !

Quantity and Quality: There were 312 proposals, collected from a total of 1,381 employees, to finally compete in the six categories for the 2006 Trophy.



### Targets for 2012

#### Protecting the atmosphere

Developing membranes for hydrogen-powered fuel cells to drive electric motors.

Technical validation of water-based anti-corrosion paints, that do not release any volatile organic compounds, using the polymer PVDC (polyvinylidene chloride).

#### Protecting water

Extending the lifetime (to at least 50 years) for PVC pipes replacing traditional materials (cast iron and other metals, concrete, etc.) for water supply and sewage pipes (PipeLife).

Developing new services in pipes and fittings made of polymers: for cleansing/treatment, recycling, separation of fats, in domestic waste water treatment.

#### Lifespans

Developing products that are more durable and have a higher service temperature (e.g. HYFLON® MFA polymer resins).

#### Health & hygiene

Developing applications and extending the markets for peracetic acid, as a disinfectant leaving no residue, for sterilization in the food-processing and pharmaceutical industries.

Contributing to biomaterials with medical applications, specifically implantable devices, using a new polymer family (SOLVIVA™).

#### Energy

Developing organic compounds for printed electronic devices, in collaboration with scientific institutes, universities and start-up companies that are able to respond very rapidly to technological developments, e.g. GeorgiaTech, EPFL and Plextronics.

Acquiring expertise through participation in specialist risk-capital companies, acquisitions and joint ventures.

