

PCT PORTRAITS

Eco-Inventors

More than 1.2 million international patent applications covering new technology of every description have been filed since the Patent Cooperation Treaty (PCT) began operating in 1978. Continuing our series of snapshots, WIPO Magazine seeks out the people behind the patents. In this edition, inventions by a Chinese-Canadian chemical engineer, an American construction worker and two Norwegian brothers from the supermarket business, put waste to work for a greener planet.

Not afraid of the big bad wolf



Courtesy of ASET/StrawJet Project

The StrawJet Harvester produces as "waste" a straw cable, which is woven into mats and compressed into robust building panels.

People react differently to bad news. When David Ward, a former construction worker from Oregon, in the U.S., was told by his doctor that exposure to building materials had made his "blood chemistry read like a list of industrial solvents," he did not retire or seek redress, but rather set about finding a less harmful way to build homes.

Knowing that traditional bricks of mud mixed with plant fiber were an effective building material, he began to investigate ways of us-

ing straw, an agricultural waste product, to construct building panels. This in itself was not new. Industrial processes already existed to produce compressed straw building blocks. David Ward's creative vision was to move the process from the factory to the field. This cut out factory overheads. And by using uncut, uncrushed straw straight from the field, he greatly increased the strength of the resulting composite.

By December 2002, with the help of the Oregon State University and a grant from the Environmental Protection Agency, David Ward had completed and field-tested his first *StrawJet* combine-harvester. This produces as "waste" a continuous five centimeter diameter straw cable, held together with a clay and paper-pulp bonding agent. In the next stage a "loom truck" weaves the cable into mats, and then into strong construction panels. Mr. Ward has formed a non-profit corporation,

the Ashland School of Environmental Technology, to take forward the project. His PCT application for the *StrawJet Harvester* was published this year.

It has taken Mr. Ward 13 years to get this far. "At times," he admitted, "I was pretty sure it was never going to work." But perseverance paid off, and the *StrawJet* project is gaining wide recognition after winning the 2006 Modern Marvel of the Year award from the U.S. National Inventors Hall of Fame.

The *Strawjet* technology aims to serve both developed countries as an ecologically sustainable building material, as well as developing countries, where straw or other plant fiber by-products (such as palm fronds or hemp) could provide a plentiful and cheap alternative to conventional materials.

More information:
www.greeninventor.org/strawjet.shtml

Treating Waste with Waste



Courtesy of C. Jia

Oil-sand deposits are an important source of crude oil in Canada and Venezuela. But the potential environmental cost of exploiting them is high. The extraction process can leave behind noxious waste products; and for every barrel of synthetic oil produced from oil-sands in Alberta, Canada, more than 80 kg of greenhouse gases are released into the atmosphere.

Enter Professor Charles Jia – a chemical engineer from China and expert in the environmental applications of sulfur chemistry, now at the University of Toronto in Canada. With his colleague, Professor Don Kirk, he developed the *SOactive* process, which uses sulfur-dioxide to convert oil-sand fluid coke into active *ECOcarbon*, and to remove mercury from industrial waste.

"To me, this is among the most beautiful pictures." Professor Jia shows a scanning electron microscope image of an ECOcarbon particle, produced from oil-sand waste.