

Higher Oil Costs Could Speed Up the Use of New ‘Green’ Materials Such as Old U.S. Paper Money in Future Fords

- The price of petroleum – used to manufacture plastics – is rising, making a stronger business case for finding new sustainable materials for Ford cars and trucks
- Potential alternatives to petroleum-based products, including old U.S. paper currency retired from service and shredded, could join soybeans, denim, plastic bottles and other materials used in Ford vehicles
- A prime example is soybean-based foam material, used in seat cushions, backs and head restraints, which saves Ford an estimated 5 million pounds of petroleum annually

DEARBORN, Mich., April 17, 2012 – Rising oil prices have Ford upping the ante in its push to reduce petroleum dependence and use more sustainable materials – including retired U.S. paper currency – to make parts.

A wide range of alternatives to products now made with petroleum are under review for potential application in Ford vehicles – from shredded retired currency to cellulose from trees, Indian grass, sugar cane, dandelions, corn and coconuts.

“Ford has a long history of developing green technologies because it’s the right thing to do from an environmental perspective,” said John Viera, Ford’s global director of Sustainability and Vehicle Environmental matters. “Now, finding alternative sources for materials is becoming imperative as petroleum prices continue to rise and traditional, less sustainable materials become more expensive.

“The potential to reuse some of the country’s paper currency once it has been taken out of circulation is a great example of the kind of research we are doing,” Viera added.

In the early 2000s, when Ford started heavily researching sustainable materials, petroleum was readily available and relatively cheap; a barrel of oil was \$16.65. Earlier this year, a barrel hit a high of \$109.77.

Adding to the appeal of the new potential resources is that they are so plentiful. For example, 8,000 to 10,000 pounds of retired paper currency are shredded daily – more than 3.6 million pounds annually. The shredded money is either compressed into bricks and landfilled, or burned.

New sustainable materials that can meet Ford’s stringent requirements and testing could join a growing list of alternatives to petroleum-based materials already in use.

Ford’s use of soybean-based cushions in all of its North American vehicles including the all-new Fusion, for example, saves approximately 5 million pounds of petroleum annually. The all-new Escape has door bolsters partially made of kenaf – a tropical plant in the cotton family – offsetting the use of 300,000 pounds of oil-based resin per year in North America.

It’s just a start.

Pie-in-the-sky no more

“Building vehicles with great fuel economy is our highest priority in reducing our environmental impact,” said Carrie Majeske, Ford’s Product Sustainability manager. “We recognize the use of sustainable materials inside our cars, utilities and trucks can also help reduce our environmental impact. These are steps that are not only better for our planet in the long run but are cost-effective as well.”

Ford has concentrated on increasing the use of non-metal recycled and bio-based materials to reduce its dependence on petroleum

Beans, Jeans, Polyethylene and More

Ford has concentrated on increasing the use of non-metal recycled and bio-based materials to reduce its dependence on petroleum products.

CURRENTLY USED

- Soybeans** Ford's use of soybean-based foam in seat cushions, backs and head restraints saves about 5 million pounds of petroleum annually
- Denim** Recycled denim is finding new life in Ford vehicles – mostly as a sound deadener
- Kenaf** A tropical plant in the cotton family is used in the door bolsters of the all-new Escape
- Plastic bottles** The equivalent of about 22 clear, plastic 20-ounce bottles made of polyethylene terephthalate are in the seat fabric of Focus Electric
- Recycled tires** Most Ford vehicles utilize, recycled-tire gaskets under the hood

POTENTIAL FUTURE USE

- Shredded money** Retired U.S. paper currency, with its strong, tensile characteristics, could be used in the manufacture of plastic parts like trays and bins
- Dandelions** Part of the Russian dandelion is being studied as a possible alternative to synthetic rubber
- Coconuts** A fiber byproduct of coconuts called coir is being studied as a potential reinforcement for molded plastics
- Corn and sugar cane** A biodegradable plastic called polylactic acid is derived from sugars in corn, sugar beet and cane and could find use in Ford vehicles

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products. Examples include:

- The new Fusion contains the equivalent of slightly more than two pairs of average-sized American blue jeans as sound-dampening material to help eliminate unwanted road, wind and powertrain noise
- Kenaf is used in the door bolsters of Escape
- Ten pounds of scrap cotton from blue jeans, T-shirts, sweaters and other items go in to the Escape's dashboard
- The equivalent of 25 recycled 20-ounce plastic bottles helps make the Escape's carpet
- Focus Electric uses a wood-fiber-based material in its doors and recycled plastic bottles in its seat fabric
- Flex has wheat straw in its plastic bins
- Taurus SHO uses a micro denier suede made from 100 percent recycled yarns

These days the phones are ringing off the hook for Ford's sustainability research team. As the business case for using sustainable materials strengthens, interest is growing in the potential of some unexpected and interesting sources, including the shredded paper money and coconut fibers. Ideas once considered pie-in-the-sky now merit serious consideration.

"We have been working with an ever-increasing list of collaborators – chemical companies, universities, suppliers and others – to maximize efforts and develop as many robust, sustainable materials as possible for the 300 pounds of plastic on an average vehicle," said Dr. Debbie Mielewski, technical leader of Ford's Materials Research and Innovation team.

That leaves sustainable materials like shredded money being tested to determine how well they perform under certain conditions. Researchers can then recommend potential use. Shredded money, for example, is being considered for interior trays and bins, said Mielewski.

There is no guarantee any or all of these sustainable materials will end up in Ford cars and trucks, she added. But Mielewski is excited about how much more attention and support her team – and the whole subject of sustainable materials – is receiving.



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Ugly bean – pretty useful

"When we first started talking about this stuff 10 years ago, it was mainly automotive and trade magazines showing interest in our research," said Mielewski. "Now it seems to be everywhere. We are working on very exciting research and it will be interesting to see what comes next and how fast."

Soybeans could be considered the root of Ford's effort to use more sustainable materials, which lower environmental impact while providing a performance equivalent to the materials they are replacing.

Henry Ford first experimented with soybeans in the early part of the last century, but the current soybean project began 10 years ago when a group of farmers approached Ford seeking new uses for the abundant soybean crop in the U.S. Midwest.

Ford researchers challenged themselves to develop soybean-based foams that met every performance and durability requirement. They chose to use the material in seat cushions because they account for two-thirds of the foam (or about 25 pounds) used in a single vehicle.

"We had to come up with a product that performed as well as or better than the products we had been using for decades," said

Mielewski.

Early versions of the soybean cushion were fraught with problems – from strong odor to falling short of Ford’s stringent quality standards. Labs full of the failed attempts still exist on Ford’s Dearborn campus.

“Because Ford has such high standards, it took a long time,” said Mielewski. “But after five years, we were finally able to meet every single requirement – compression, durability, everything.”

Still, in the early 2000s the fact remained: Petroleum and plastic were inexpensive, and it was just too costly to change the way things had been done for about 100 years. The lack of urgency at the time became an advantage, said Mielewski.

“We were left alone to get creative, take our time and figure out where and how these – and future – sustainable materials might fit into our vehicles and processes, and that’s great news for both our customers and the environment,” said Mielewski.

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About Ford Motor Company

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