Greening the Blue Oval

Deborah Mielewski, PhD Senior Technical Leader Sustainable Materials Ford Motor Company



Ford's Rich History in Bio-Materials



Our vision for the 21st century is to provide SUSTAINABLE transportation that is affordable in every sense of the word:



...while the automobile provided tremendous benefits to mankind in the 20th century, "it also had a major negative impact on the environment. To be considered a leader in corporate citizenship, an automobile company must demonstrate leadership in addressing environmental concerns."

- Bill Ford

Bio-Materials: Why Now?

- Increased use of renewable feed stocks and agricultural products
- Increased use of recycled or waste by-products
- Reduce dependence on foreign petroleum
- Improved material life cycle
- Improved performance in select functions
- □ Increased consumer awareness







What is Soy Foam?





Ford Motor Company

Biomaterials Research Group

Key Technical Challenges

Formulations:

Optimizing formulation for levels of soy used Balancing gel/blow reactions for soy formulation Blend stability between bio-polyol and petroleum-polyol

Odor:

Odor of blown soy oil and resulting foam

Properties:

Passing material specifications Meeting performance and plant requirements



One of the first soy-based foams!



Soy Foam Journey





Implementation of Soy Foam on 2008 Mustang



Seat supplier:

Lear Corporation Applications: seat cushion & back





Times Square, New York, July 2007

Biomaterials Research Group



Ford Motor Company

Ford Press and Awards WALL STREET JOURNAT 28sex JILLIAN shares the ngs try Siggest Los secrets that work for ever ped MAKING STUFF wants these th you! Smithsonian sneak you car icks: Institution \$5.000 nore

without outling you

When

mom

and dad go to war







gy

best

u summer America's greatest burgers!

uty buys

Excellence in New Uses Ford Research & Advanced Engineering 2006



Materials Development and Usage





PBS

Success: Soy Foam migration



There are **31,251** soybeans used in a typical Ford vehicle for seat cushions and backs







CO₂ Emissions Reduction



Implementation of Wheat Straw on 2010 Ford Flex—with IAC



reduces petroleum usage by some 20,000 pounds per year and reduces CO₂ emissions by 30,000 pounds per year



Ford Motor Company

Positive press

"*Pulp Function*: Ford and Weyerhauser collaborate To deliver automotive applications using natural fibers"

"*Built Ford Green*: Sustainable Materials Make America's Best-Selling Truck Environmentally Friendly and Tough"

"Ford spills Coca-Cola technology all over its new car seats"

2014 MKX Introduces Tree-based alternative...

"That Ford, it smells like money!" WSJ.com

"Car parts made from cash?" nbcnews.com



Biomaterials Research Group



Ford Motor Company

Implementation of Kenaf Fiber on 2013 Ford Escape—with IAC









Implementation of Cellulose Fiber December, 2013—with JCI





Sustainable Materials Research



Success: Renewable Materials

Renewable feedstocks in production at Ford today





cellulose



Plant PET Collaborative Page Coco Cola Teres





PTC Mission:

To lead the acceleration of knowledge and technology to enable commercially viable, scalable, sustainably sourced, affordable, 100% plant-based PET before 2020.







Ford is a founding member of the Bioplastic Feedstock Alliance, working together with WWF and seven other leading brands to encourage the responsible development of plant-based plastics



featured in prominent museum







RETHINK PLASTICS AT THE BURKE

"PLASTICS UNWRAPPED" Dec 20, 2012 - May 27, 2013



UNIVERSITY of WASHINGTON





The Science, History and Culture of Corn





Stone Age, Bronze Age, Iron Age...and now the Age of Plastic.

Exploring the significance of plastic, its influence in our lives, and how we document and preserve this history.

In fewer than 200 years plastic has transformed our world such that we can't imagine life without it and have only begun to consider the ingenuity of its discovery

A Corporate Philosophy...



Ford's Sustainable Materials Strategy

Vision

Ford Motor Company will ensure that our products are engineered to enable sustainable materials leadership without compromise to Product Quality, Durability, Performance or Economics.

Key Positions

-Recycled and renewable materials must be selected whenever technically and economically feasible.

-There will be no compromise to Product Quality, Durability & Performance or Economics.

-We will enhance technologies, tools and enablers to help validate, select and track the use of these materials in our products.

-The use of recycled and renewable content is increased year by year, model by model where possible.



Purchase Funnel



THE BIG SHFT

Fusion{meets}Fusion

Find Ford



SOY BEANS • COCONUT • WHEAT STRAW • DANDELION GREENS

CUSTOMER SATISFACTION

AWARENESS

CONSIDERATION

SHOP

BUY

Biomaterials Research Group





Ford Motor Company

Do Sustainable Materials Sell Cars?

Not directly yet, but....

- ·brand image value
- protecting the business for future unknowns
- reduce environmental impact
- next generation of customers









Ford Motor Company



The Power of Collaboration

