

DuPont and Biofuels

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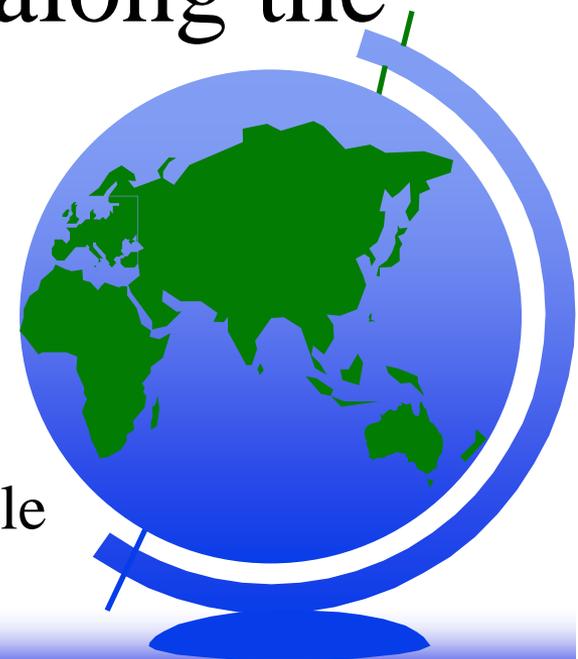
*The miracles **o**f science™*



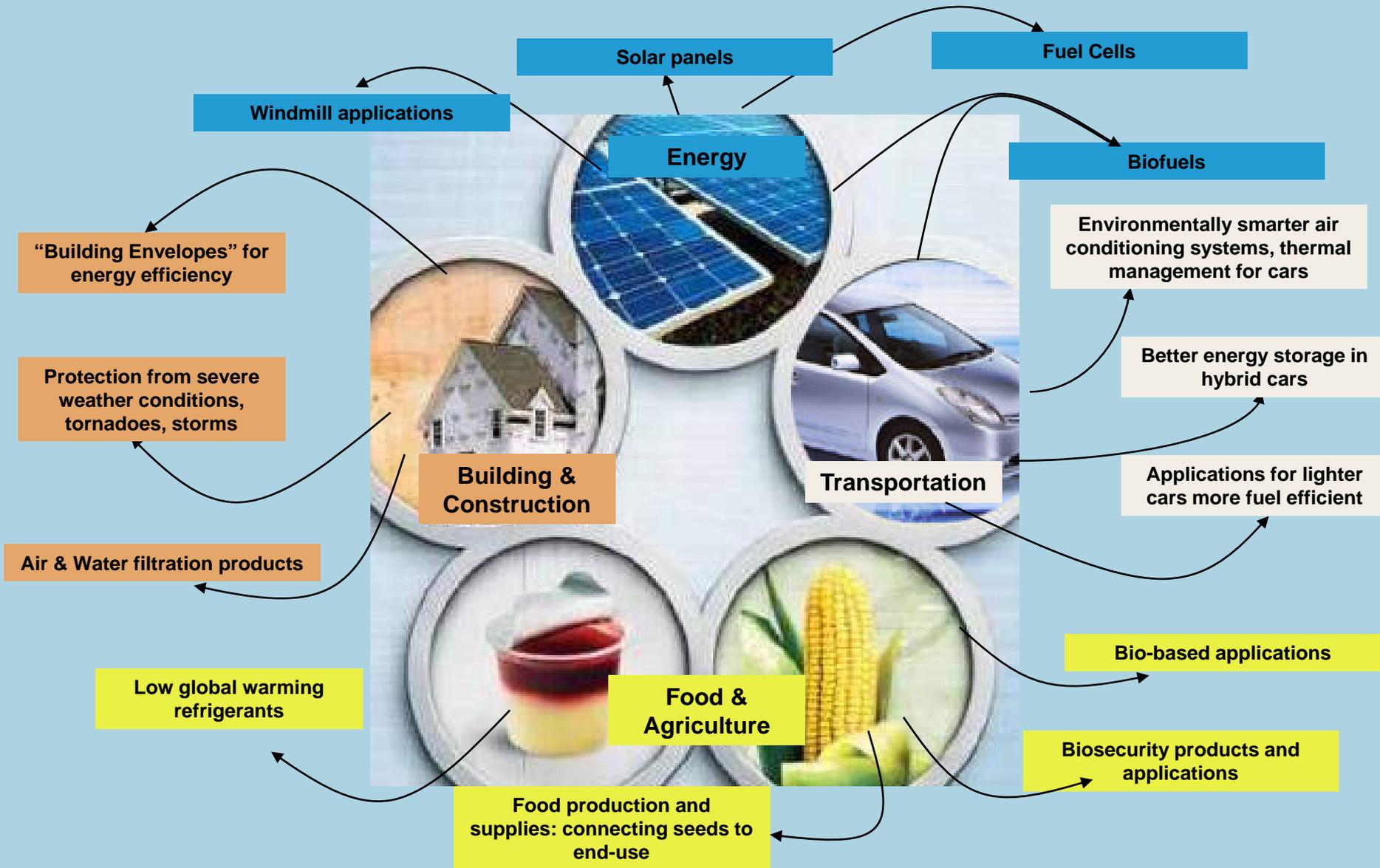
DuPont Mission: Sustainable Growth

☞ Increasing shareholder and societal value while reducing the environmental footprint* along the value chains in which we operate.

- * DuPont defines footprint as all injuries, illnesses, incidents, waste, emissions, use of water and depletable forms of raw materials and energy.



Solutions to Serve the Marketplace



DuPont Biofuels

- Biology will help reduce global reliance on fossil fuels
- DuPont solutions -- sustainable, renewable and matched to real-world needs
 - Integrate modern biological tools into world-renowned chemistry and engineering capabilities
 - Renewably-sourced chemicals and fuels



Three-Part Biofuels Strategy

- Improve existing ethanol production via differentiated agriculture seed products and crop protection chemicals
- Develop, supply next generation biofuels with improved performance
- Develop, supply new technologies to allow conversion of cellulose to ethanol



Improving Ethanol Yield - Seed Technology and Crop Protection

- ☞ Pioneer Hi-Bred customized crop genetic solutions
 - 170 Pioneer brand ethanol hybrids
 - Improving corn grain composition → increased ethanol yield, more valuable food and feed co-products
 - Improve supply-chain efficiencies to better-link farmers, ethanol producers.
- ☞ DuPont Crop Protection protecting yields of biofuel crops
 - Corn, sugar cane, sugar beets, switchgrass



DuPont-BP Biobutanol

- ☞ Biobutanol formulations deliver good fuel characteristics
 - Energy density
 - Controlled volatility
 - Sufficient octane
 - Low levels of impurities



Biobutanol Performance

Benefits

- Energy content closer to gasoline
- Opportunities to add more biofuels to gasoline
- Can easily be used in existing distribution infrastructure
 - Gasoline blended with butanol less susceptible to separation than ethanol/gasoline blends
- Compatible with current vehicle and engine technologies



Other Biobutanol Benefits

- ☞ Environmental benefits
 - GHG benefits at least as good as ethanol
 - Low vapor pressure → lower VOC emissions
- ☞ Synergy w Ethanol
 - Existing ethanol capacity can be retrofitted to butanol production
 - Same agricultural feedstocks as ethanol
 - Reduced vapor pressure enhances co-blending w gasoline/ethanol blends



Are Food, Feed, Fiber and Fuel Competing Uses of Ag Commodities?

- ☞ Some suggest that agriculture cannot supply all of these needs, and that governments should make choices between them.
- ☞ A long history of agricultural yields and productivity in North America indicate otherwise.



The Power of Agricultural Productivity

+13%

The growth in world **population** over the last 10 years

+36%

The growth in global **income** over the last 10 years

+21%

The growth in **meat** consumption (Beef +14%, Pork +11%, Chicken +45%) over the last decade

+34%

The growth in world **corn** consumption over the last decade

+52%

The growth in world **soybean** consumption over the last decade

+6%

The growth in world **crop area** harvested over the last decade

Agriculture Can Provide Food, Feed, Fiber and Fuel in Abundance

☞ Either/or is a false debate.

- Policies should focus on greater agricultural productivity, especially in the developing world.
- Expanded agricultural production will expand health, stability and economic opportunity in the developing world, and help green the US economy.



DuPont–Danisco Cellulosic Ethanol

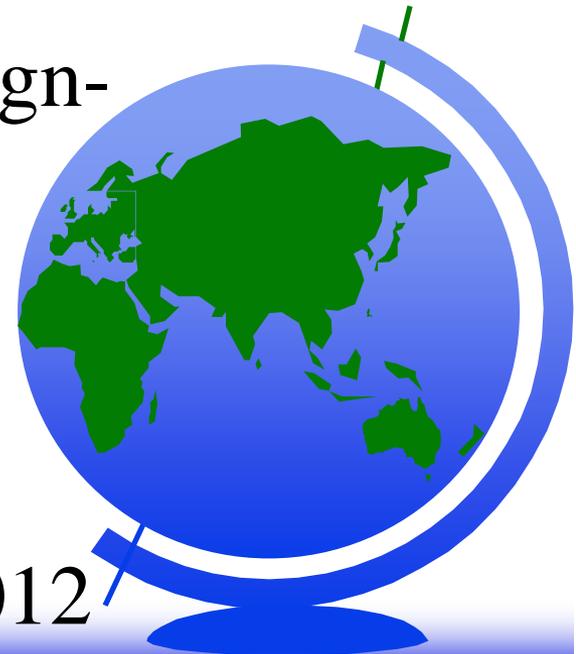
- \$140 million – DuPont and Genencor division of Danisco
- Commercialize leading technology package for non-food based, cellulosic ethanol production
- License technology package directly to ethanol producers
- Establish regional cellulosic ethanol affiliates



DuPont–Danisco

Cellulosic Technology

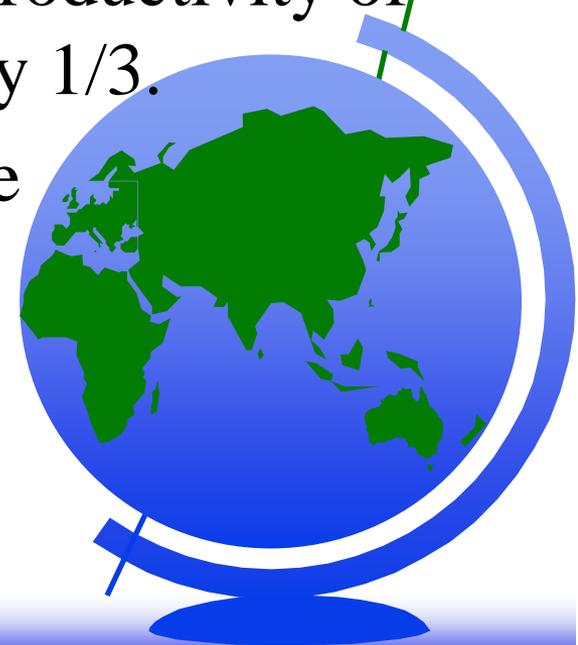
- ☞ Technology package can be used as “bolt-on” to existing ethanol plant
 - Expanding capacity to accept cellulosic feedstocks
- ☞ Technology package can be design-basis for stand-alone cellulosic ethanol facility
- ☞ Operational this year
 - Corn cobs and switch grass
- ☞ Commercial-scale production 2012



Cellulosic Biofuels/Biomaterials

Reduce Oil Demand and Price

- DuPont Danisco Cellulosic Ethanol will produce from corn stover at pilot scale 2009, commercial scale by 2012.
- Ethanol from corn stover expands productivity of existing acreage and biorefineries by 1/3.
- Iowa State estimates biofuels reduce US gasoline prices \$.25-.40/gallon.
- Biomaterials like DuPont Sorona and Cerenol further reduce oil demand.



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