DuPont Energy Innovations

Uma Chowdhry
Senior Vice President & Chief Science & Technology Officer

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DuPont Growth Platforms

- DuPont Coatings & Color Technologies: $6.6 B
- DuPont Safety & Protection: $5.6 B
- DuPont Performance Materials: $6.6 B
- DuPont Electronic & Communication Technologies: $3.8 B
- DuPont Agriculture & Nutrition: $6.8 B

Revenue 2007
Today’s World

- FOOD CRISIS
- POLLUTION
- GAS SHORTAGES
- FRESH WATER SHORTAGE
- URBANIZATION
- BLACKOUTS
- MELTING GLACIERS
Current U.S. Energy Portfolio

U.S. Primary Energy Consumption by Source and Sector, 2007
(Quadrillion BTU)


Prices by Energy Type, Indexed to 1970

INDEXED PRICE

Source: Energy Information Administration, website data
DuPont Journey Toward Sustainable Growth

Business Integration

Compliance

Corporate Environmentalism

SHE Commitment

Sustainable Growth

Sustainable Growth -- Market Facing Goals

Value


The Goal Is ‘0’

Renewable Energy, Energy Use Flat
Commercial Value of Conservation

Goal:
Hold total energy flat with 1990 levels.

Progress:
- Consumption down 7 percent overall as compared to 1990.
- Since 1990, production volume grew by 40%.
- Saved the equivalent of 20M barrels or 8 trillion BTUs in energy.
- $3B saved over 16 years
Mission

Sustainable Growth

DuPont has a mission of sustainable growth, which we define as the creation of shareholder and societal value while we reduce our environmental footprint along the value chains in which we operate.
Mandated demand split by technology according to either mandate or available information on feedstock capacity plans for wave 1

Source: RFA; Unica (Brazil); European Commission; FO Licht; Press; McKinsey analysis
Ethanol Production

**Today**

- Grain → Corn → Stover
- Dry Grind → Corn Gluten Feed → Glucose/Xylose
- Wet Mill → Corn → Sugar
- Glucose → C6/Fermentation → Ethanol
- Saccharification → Glucose/Xylose
- C6/C5 Fermentation → Separation
- Lignin → Ethanol

**Tomorrow**

- Milling → Pretreatment → Saccharification → Glucose/Xylose
- C6/C5 Fermentation → Separation → Ethanol
- Steam → Electricity

Tomorrow Today
Project concept demonstration
Proceses for an Integrated Corn-based Biorefinery

Feedstock Harvest

Feedstock Transport

Feedstock Conversion

Fermentation Production

Ethanol & Chemicals

Separation

Downstream Markets

✓ Chemicals
✓ Biofuels

DOE 1435-04-03-CA-70224

“These are the best results we’ve seen so far”. – DOE/NREL
Pilot process demonstration

Partnerships to accelerate commercialization

DuPont Danisco Cellulosic Ethanol

Pretreatment
Enzymatic hydrolysis
Fermentation to ethanol

The world’s first robust, integrated solution for biomass-to-ethanol
Commercial design development

Creating the Standard

Capabilities
Investment
Intellectual Property

DuPont Danisco
Cellulosic Ethanol LLC
R&D

University of
Tennessee Partnership

Pilot scale biorefinery
Corn stover
Switchgrass
December 2009 start-up

Partnerships key to success

Equity Owner
Technology Provider
Operations Management

Business Model
Anticipates Multiple Value Capture Mechanisms

December 2009 start-up
University of Tennessee Partnership
Biobutanol – the Advanced Biofuel

Biobutanol delivers significantly improved logistics & fuel performance across the value chain

Attributes

- Lower Distribution Costs / Refinery Blending
- Higher Blending Value and Higher Blend Levels
- Infrastructure compatibility
- Higher energy density (26%)
- Greater compatibility with existing engine designs and other materials
- Synergistic with Ethanol

Market Value

Miles per gal. Refinery efficiencies Distribution flexibility

Partnerships for Market access
Sustainable Transportation Imperative

US Gasoline Demand

Challenges

- Market uncertainties
  - Oil price volatility
  - Regulatory policies
  - Consumer acceptance
  - Infrastructure

- Technical uncertainties
  - Technology maturity
  - Technology access
  - Price / Performance progress
  - Technology integration
  - Investment

Source: IEA World Energy Outlook
The Opportunity for Alternative Energy Sources

U. S. Primary Energy Consumption by Source and Sector, 2007
(Quadrillion BTU)

<table>
<thead>
<tr>
<th>Source</th>
<th>Percent of Source</th>
<th>Percent of Sector</th>
</tr>
</thead>
<tbody>
<tr>
<td>Petroleum</td>
<td>39.8%</td>
<td>96</td>
</tr>
<tr>
<td>Natural Gas</td>
<td>23.6%</td>
<td>44</td>
</tr>
<tr>
<td>Coal</td>
<td>22.8%</td>
<td>37</td>
</tr>
<tr>
<td>Renewable Energy</td>
<td>6.8%</td>
<td>91</td>
</tr>
<tr>
<td>Nuclear Electric Power</td>
<td>8.4%</td>
<td>6</td>
</tr>
</tbody>
</table>

Transportation: 29.0%
Industrial: 21.4%
Commercial / Residential: 10.6%
Electrical Generation: 40.6%

Consensus view is that grid parity will start within next 5 to 10 years and greatly expand PV demand.
Advanced Materials for PV Modules

**Today**
Crystalline Si (c-Si) PV cells & modules

- Elvax® EVA
- Rynite® PET resin
- Mylar® PET film
- Tedlar® PV 2001
- Solamet® Metallization pastes
- Teflon® ETFE

**Tomorrow**
Amorphous Si (a-Si) thin film PV modules

- Teflon® ETFE
- Butacite® PVB
- Tedlar® PV 2001
- Rynite® PET resin

Crystalline Silicon PV cells & modules

Amorphous Silicon thin film PV modules
1. Optics and System Integration
   - U. of Rochester
   - SAIC
   - DuPont
   - HP
   - Energy Focus

2. High Band
   - Georgia Tech
   - NREL
   - U. Delaware

3. Mid Band
   - Emcore
   - NREL

4. High Performance Silicon
   - U. Delaware
   - ANU

5. Scavenger Silicon
   - Blue Square Energy

6. Low Band
   - U. Delaware
   - NREL
Sustainable Building Solutions

1. DuPont Photovoltaic Solutions
2. DuPont Cabling Solutions
3. DuPont™ Corian®
4. DuPont Fire Extinguishants
5. DuPont™ Optilon®
6. DuPont™ SentryGlas®
7. DuPont™ Tyvek® Commercial Wrap®
8. DuPont™ Tyvek® Flashing Systems
9. DuPont Refrigerants
10. DuPont™ Sorona®
Scientific Collaboration in Energy

Universities
- Expedite collaboration models
- Invest in scientific discovery
- Challenge societal inertia

Industry
- Focus development
- Collaborate broadly
- Develop sustainable solutions

Transforming Through Partnership

Government
- Set strategic direction
- Provide incentives
- Reduce roadblocks

Energy challenge CAN and MUST be solved
LET’S MAKE IT HAPPEN!