



Dow's Approach to Sustainability: New Thinking and New Solutions

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History of Sustainability at Dow

- The concepts of Sustainable Development have been part of Dow's fabric since its founding
 - Driving global implementation of Responsible Care
 - Waste Reduction Always Pays (WRAP)
 - Collaboration and Partnerships
 - Michigan Source Reduction Initiative (MSRI)
 - Alliance to Save Energy
 - EPA High production volume chemical testing program
 - Dow's voluntary participation in the EPA Voluntary Children's Chemical Evaluation program
 - Innovative products
 - Sentricon™ System termite treatment
 - PROFUME™ Gas fumigant



What we achieved between 1996 - 2005

- Tremendous impact through 2005 EH&S goals:
 - Saved \$5 billion on an investment of \$1 billion in technology and processes
 - Reduced solid waste by 1.6 billion pounds- enough to fill 415 *football* fields one meter deep
 - Reduced waste water by 183 billion pounds - equal to water usage for 170,000 U.S. homes for one year
 - Saved 900 million BTUs of energy - enough to power 8 million U.S. homes for one year
- The result is:
 - A workplace that is 20 times safer than working in a supermarket
 - Cleaner facilities
 - More efficient energy use
 - Stronger and more vigilant corporate governance





Our perspective changed



At Dow, sustainability is about our relationship with the world and how we contribute to solving its many challenges.





Dow's Sustainability Approach

More than just our own actions . . .

More than just supplying products . . .

More than just industry . . .





Dow's 2015 Sustainability Goals

Sustainable Chemistry

Products Designed to Solve World Challenges

Product Safety Commitment

Local Protection: Human Health & Environment

Contributing to Community Success

Energy Efficiency and Conservation

Addressing Climate Change

Technology
Solutions

Local
Citizenship

Global
Footprint



Sustainability and the Green Chemistry Approach

- Green chemistry needs to incorporate life cycle approach
 - Incorporate economic, social and environmental aspects
 - Acknowledge trade-offs
- Role of technology solutions
- Climate change as case study
 - products and technology delivering solutions



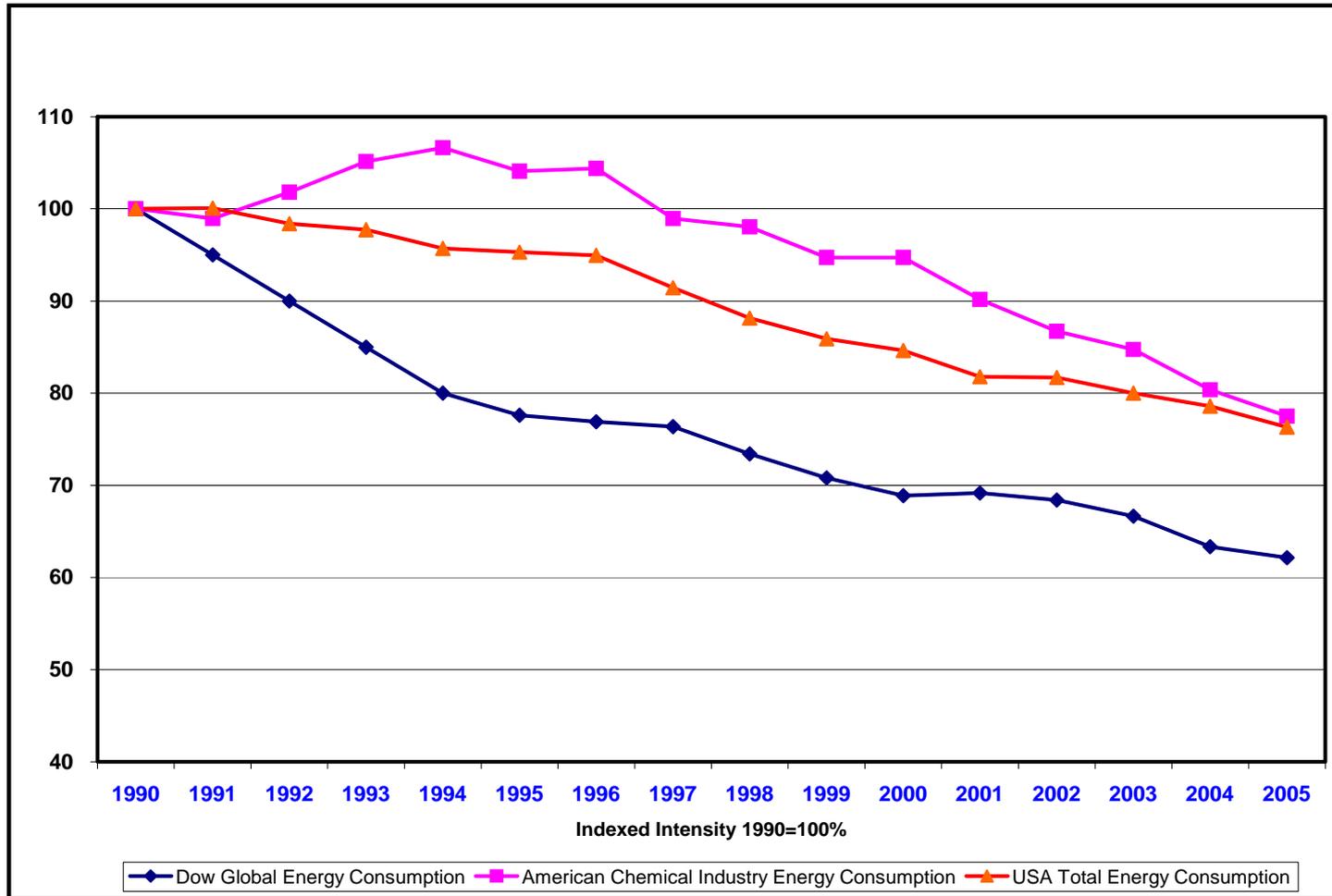
Case Study: Chemistry Solutions to Climate Change

- We believe providing humanity with *a sustainable energy supply while addressing climate change* is the most urgent environmental issue our society faces.
- *Innovation in the areas of renewable and alternative energy* will play a significant role in meeting the world's energy needs - and will have a positive impact on climate change.

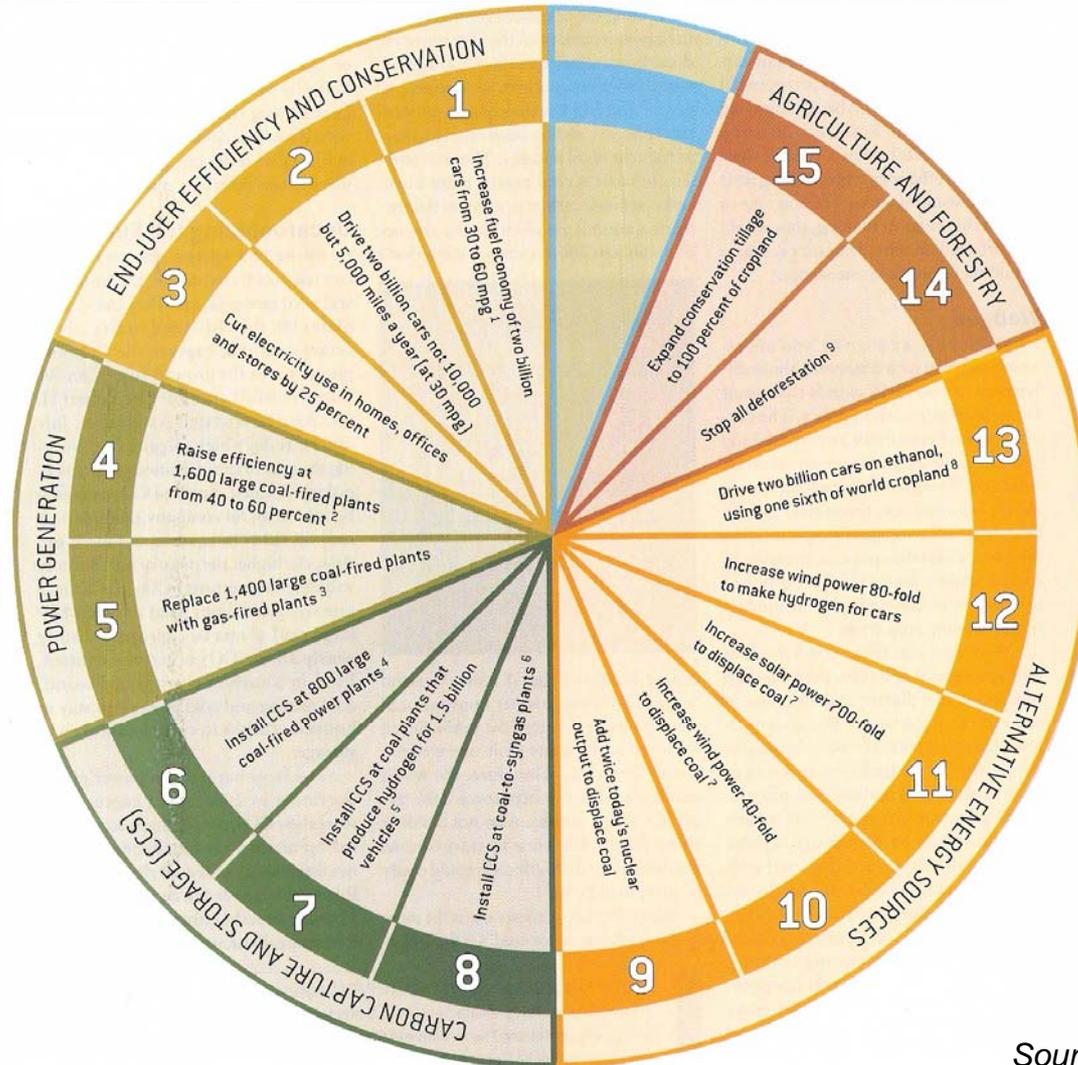




Improving Dow's Energy Intensity



Wedge solutions



Source: Socolow & Pacala, 2006



Dow is taking a multi-faceted approach

Dow has a role in nearly every wedge. Here are some highlights...



End-user efficiency and conservation

W1 - Improved fuel economy for cars and trucks

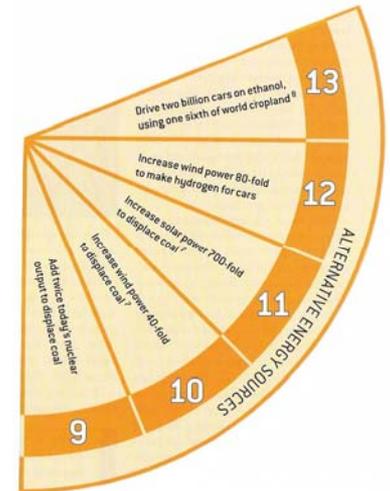
W3 - More efficient buildings

Alternative energy sources

W10 - Wind electricity

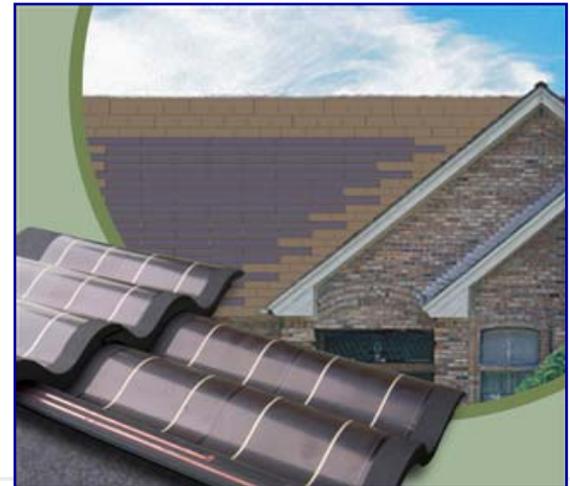
W11 - Photovoltaic electricity

W13 - Biofuels and bioproducts





Dow Photovoltaics: *Doing for Homes What Plastics Did For Automotive. . .*





Renewable feedstocks & Dow

Soy-based polyols



Low cost, high performance, and renewable

Applying technology solutions to other world challenges

- But there are other challenges we face besides climate change
 - scarce resources such as water
 - product remanufacturing and recycling to avoid waste to landfill
 - affordable, durable and energy-efficient housing
- Dow is working on sustainable chemistry to:
 - better manage resources (e.g. water, energy, raw materials)
 - improve health
 - reduce source materials use and waste



HPPO: Dow & BASF's New Propylene Oxide Process

- **Simpler raw material integration:**
 - Uses hydrogen peroxide and propylene and produces PO and water
 - Avoids need for co-product markets
 - Reduced physical footprint
- **Sustainability Profile:**
 - Waste water reduced by 70 to 80%
 - Energy use reduced by 35%
 - Requires up to 25% less capital

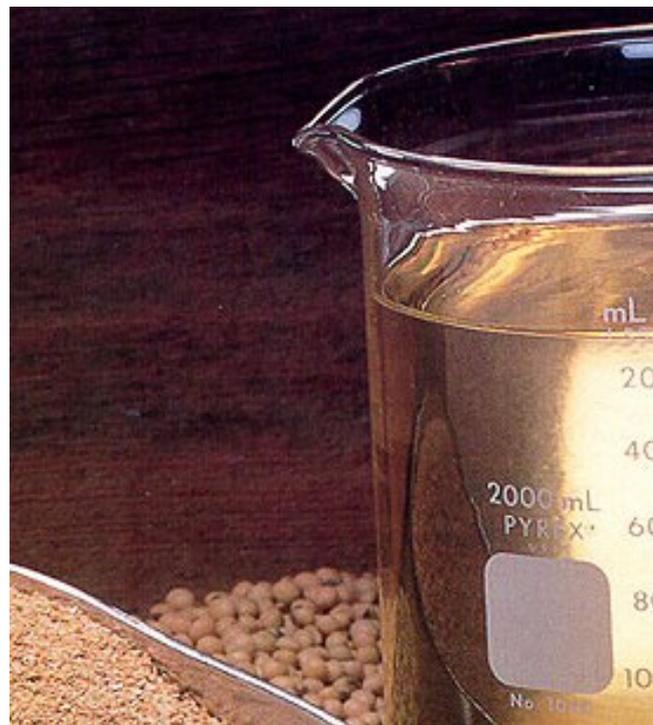


Economic and Environmental Benefits



Epichlorohydrin from glycerine

- Uses glycerine, a by-product of the biodiesel production process
 - Creates significant cost & environmental advantages vs. conventional process technologies
 - Applications
 - Electrical laminates
 - Coatings
 - Adhesives
- Sustainability Profile
 - Unexpectedly clean, simple
 - Low cost, low capital
 - Waste water reduced by 70 percent
- World-scale plant in China to be online 2010



Economic and Environmental Benefits



Industrial Stretch Film

- Improvements in resin design and polymer processing have allowed down-gauging of industrial stretch film 25+% in last decade.
 - Critical Property requirements
 - Extensibility
 - Puncture Resistance
 - Recyclability (hundreds MM lbs/year)
 - Global market size of ~3 billion pounds/yr
 - This down-gauging saves over 1 billion pounds per year of PE
- Sustainability Profile
 - Not Producing 1 billion pounds of LLDPE* = 36.6 trillion BTUs
 - Equivalent to 293 million gallons of gasoline
 - Enough energy to heat and cool 643,000 homes for a year

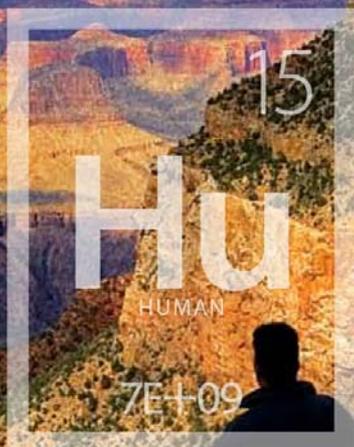


Source Reduction & Recycling

* US EPA

Sustainability Going Forward

- Focus industry, academics and governments on the key societal challenges or sustainability gaps
 - Then use systems to encourage creativity and innovation
- Need flexible, non-traditional programs (versus traditional regulatory approach)
 - Incentives
 - Harness the power of markets to drive innovation
 - Life cycle analysis
 - Consumer choice
 - Transparency of information
 - Education



**FROM WHERE WE STAND, THERE'S
OPPORTUNITY AS FAR AS THE EYE CAN SEE.**

In the bond between chemistry and humanity you see the potential for solving human problems. New thinking and new solutions for health, housing, food and water. The Human Element. It's what The Dow Chemical Company is all about.