



A CATALYST FOR CHANGE

DOW'S APPROACH TO SUSTAINABILITY

Henry T Kohlbrand
Global R&D Director
Engineering & Process Sciences
The Dow Chemical Company

The Power of the Human Element At The Dow Chemical Company, we view chemistry as the work of humanity. We believe the most important element of all is not found on the periodic table, yet is part of every equation for the future. This element is the Human Element. With it, we are more than a chemical company, we are a difference-maker in the world.



ABOUT DOW



A science and technology leader
with annual sales of \$54 billion

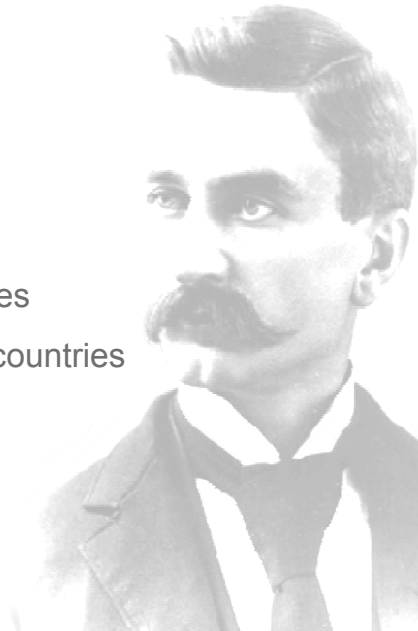
Founded in 1897 by Herbert H.
Dow in Midland, Michigan

Supplies plastics and chemical
products to customers in 160 countries

From 156 manufacturing sites in 37 countries

Employs 46,000 people globally

**“If you can’t do it better,
why do it?”
-- Herbert H. Dow**



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3

THE ELEMENT OF CHANGE



Our Vision is to be the largest, most profitable and
most respected chemical company in the world.

Our mission is to constantly improve what is
essential to human progress by mastering science
and technology.

Sustainability requires making every decision with
the future in mind. It is our relationship with the
world around us – creating economic prosperity
and social value while contributing to the
preservation of our planet.



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4



SUSTAINABILITY



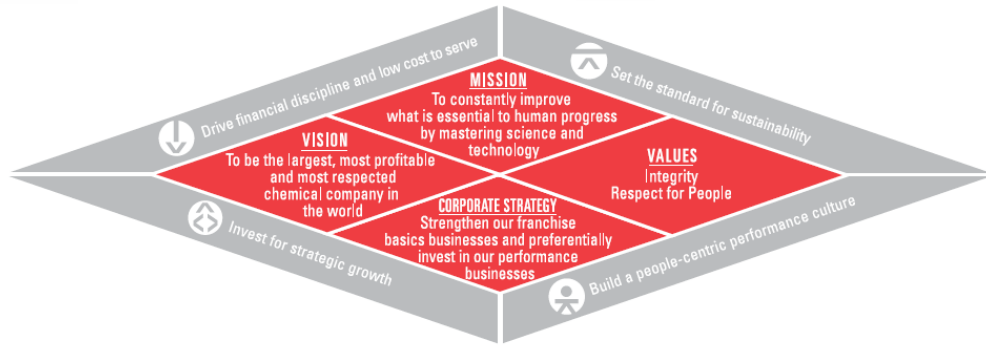
Integrated into our corporate strategy



Drive Financial Discipline
And Low Cost to Serve



Set the Standard
For Sustainability



Invest for Strategic Growth



Build a People-Centric
Performance Culture

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5

A HISTORY OF STRIVING FOR SUSTAINABILITY



- 1897 – Dow designs “Bleach Lifters Bonnet” protective unit
- 1906 – Dow partners with George Westinghouse to develop energy saving Co-Generation
- 1934 – Mammalian toxicology research laboratory established
- 1935 – First industrial use of bacteria to degrade phenolic waste
- 1948 – First full-time industrial hygienist
- 1967 – “War on BTUs” energy conservation program launched
- 1970 – Dow publicly commits to product stewardship role
- 1979 – Dow Chemical Foundation formed; supports science education
- 1986 – Waste Reduction Always Pays (WRAP) program launched
- 1987 – Dow commits to Responsible Care®
- 1991 – Corporate Environmental Advisory Council (CEAC) formed
- 1996 – Dow Executive Claude Fussler writes *Driving Eco Innovation*
- 1997 – Dow CEO Frank Popoff pens *Eco-Efficiency: The Business Link to Sustainable Development*

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6

SUSTAINABILITY MILESTONES



Through our first set of Sustainability Goals, our 2005 EH&S Goals, we have already:

- Saved over **\$5 billion** with a **\$1 billion** investment
- Reduced solid waste by **1.6 billion pounds**
 - Enough to fill 415 football fields one meter deep
- Reduced water use by **183 billion pounds**
 - Equal to water usage for 170,000 U.S. homes for one year
- Saved **900 trillion BTUs** of energy
 - Enough to power **8 million** U.S. homes for one year
- Reduced personal safety and health incidents by 84%

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7

CONTINUING TO MAKE AN IMPACT



Our Approach to Sustainability

Sustainable Chemistry

Breakthroughs to World Challenges

Product Safety Leadership

Local Protection of Human Health & the Environment

Contributing to Community Success

Energy Efficiency & Conservation

Addressing Climate Change

Solutions

Citizenship

Footprint

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8



SUSTAINABLE CHEMISTRY



Sustainable chemistry is our “cradle to cradle” concept that drives us to use resources more efficiently to:

- Minimize our footprint
- Provide value to our customers and stakeholders
- Deliver solutions for customer needs
- Enhance the quality of life of current and future generations

Solutions

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9



GOAL OBJECTIVES



With our deep expertise in science and technology, Dow is uniquely positioned to realize the full potential of sustainable chemistry, which includes:

- A lifecycle view of our products, processes, and product uses,
- Using resources extremely efficiently to minimize our footprint
- Improving the quality of the environment,
- Providing positive value and return for all our stakeholders, and
- Enhancing the quality of life for current and future generations.

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10

INCORPORATING SUSTAINABILITY INTO DOW BUSINESSES



Vision for the Company

- Drive sustainability into decision making process
- Instill life cycle thinking throughout Dow
- Like safety, make sustainability a part of everyday thinking
- Recognized externally as a leader in sustainability
- Motivated employee base

Emphasize Sustainable Practices Within the Company...

...Set the Standard for Sustainability

Thanks to the hard work and dedication of our employees, improvements we have implemented have delivered results.

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11

BREAKTHROUGHS TO WORLD CHALLENGES



We are actively working toward, and committed to achieving, at least three breakthroughs by 2015 that will significantly help solve the challenges of:

- Adequate food supply
- Affordable housing
- Alternative energy
- Sustainable water supplies
- Improvements in personal health

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12



PRODUCT SAFETY LEADERSHIP



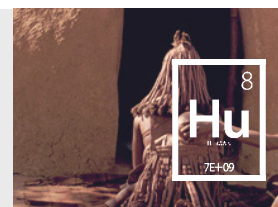
- We are the first chemical company to make non-technical language summaries of our product safety assessments accessible to the public on www.dowproductsafety.com.
- The assessments cover topics such as basic hazards, use, risk and risk management.
- We will complete evaluations, with third party process verification, on high priority products by 2010 and for all products by 2015.

Solutions

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13

LOCAL PROTECTION OF HUMAN HEALTH & THE ENVIRONMENT



- We lead the way across virtually every facet of environment, security, health and safety performance.
- We were one of the first companies to introduce innovative protection equipment for our workers in 1898.
- We engage our neighbors through Community Advisory Panels.
- Our **Vision of Zero** is a leadership attitude and a corporate culture that is committed to zero accidents, zero injuries and zero excuses.

Citizenship

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14

CONTRIBUTING TO COMMUNITY SUCCESS



We are an engaged corporate citizen globally and locally. Where we have a major presence, we are collaborating with local businesses and citizens to help create stronger, safer and sustainable communities through:

- Engagement
- Establishing joint goals and plans
- Taking actions for the long-term success of all involved

Citizenship

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15

ENERGY EFFICIENCY & CONSERVATION



We are one of the largest producers of innovative products that reduce energy use through:

- Building insulation applications
- Solutions for fuel-efficient vehicles
- Technology to enable wind power
- Integrated solar systems into building materials

Using 2005's Energy Intensity base to project what energy consumption would have been, efficiency and conservation improvements have yielded savings of over **26 trillion BTUs and \$190 million...**

...and we continue to drive more efficiencies and conservation.

Footprint

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16



IMPORTANCE OF ENERGY TO DOW



- World's largest industrial consumer of power and steam
 - Requires **3,700 MW** of electricity to operate
 - Equivalent to the energy used by San Francisco, San Diego & Oakland combined
- Feedstock demand is **800,000 barrels/day**, estimated value \$30+ billion/year
 - 40-50% of Dow's total annual operating costs and expenses
- Leading innovator in cogeneration
 - Increased efficiency with reduced impact on the environment
 - Uses **20-40% less fuel**
- Self-generates **~75%** of all power & steam
- Operates over **\$6.2 billion** in energy assets & supports **\$2.5 billion** in JV assets



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17

OUR RESULTS



Impact to Dow:

- Sustained Drive to Energy Intensity Reduction of 22%
- Cumulative Energy Savings = Approx 900 Trillion Btu's
- Cumulative avoided GHG (CO2 equi) emissions of ~ 51 Million MT
- Cost Savings (avoided fuel) = Over \$ 4 Billion
- Demonstrated Long-Term Effectiveness of our Program
- Added Value to Corporate Reputation
- Positions us for even further, more ambitious Goals



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18



ADDRESSING CLIMATE CHANGE



- Since 1990, we reduced our absolute greenhouse gas (GHG) emissions by over 20%; ***more than required by the Kyoto Protocol.***
- Over 96% of products involve chemistry, so no one has more at stake – or the ability to impact – energy supply and climate change issues than we do.
- Our products, across our portfolio, reduce GHGs by multiples more than our own emissions on an annual basis.

Footprint

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19

ARSENIC REMOVAL FROM DRINKING WATER

Environmental & Social Benefits



ADSORBSIA™ GTO™ Arsenic Removal Media

- Titanium-based media
- Removes As(III) and As(V) under typical pH conditions
- Fast kinetics

Sustainability Profile

- Handles a wide variety of water conditions
- Safe disposal
- Allows for
 - Flexible system design
 - Smaller, less expensive systems



BUILDING INTEGRATED PHOTOVOLTAICS

Environmental & Social Benefits

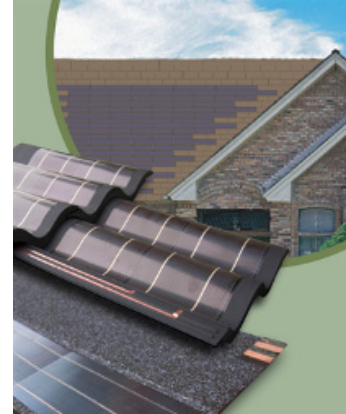


Solar collection materials incorporated directly into building materials

- Commercial and residential
- Roofing, siding & exterior finishing products
- Outer protective surface & power generation
- Products rugged and easily installed

Sustainability Profile

- Renewable energy source
- Excess energy goes to local power provider
- Allows for broader application
- Covers more roofs and more roof surface



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21

POLYOLEFIN DISPERSIONS FOR CARPET APPLICATIONS

Environmental & Social Benefits

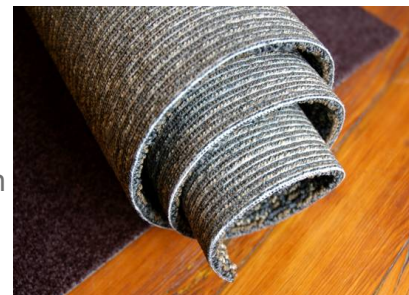


HYPOD™ Polyolefin Dispersions

- Thermoplastic carpet backing
- Enabled by BLUEWAVE™ Technology
- No new coating equipment required
- Excellent physical properties
- Variety of end use carpet applications
- Excellent wet strength, tuft lock strength

Sustainability Profile

- Easier recycling
- Low odor
- Lighter weight end-product



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22

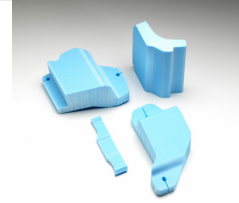
ENERGY ABSORBING FOAM PROTECTS DRIVERS

Environmental & Social Benefits



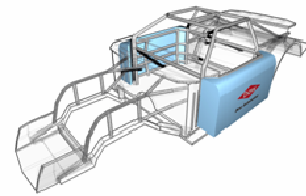
IMPAXX™ Energy Absorbing Foam

- Up to 30% more efficient than other foams
- Used in NASCAR “Car of Tomorrow” race cars
- Used on nearly 2 million passenger cars worldwide
- Consistent temperature performance -40C to 80C
- Fast prototypes, low cost development, lower prices to drive customer cost savings



Sustainability Profile

- Recyclable
- Up to 50% lighter than competitive materials, offering weight savings and fuel efficiency



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23

SUGAR CANE TO POLYETHYLENE

Economic, Social & Environmental Benefits



Dow joint venture in Brazil

- Less fossil resources than traditional hydrocarbon processes
- Biomass (bagasse) produces heat, electricity and steam for ethanol, ethylene and polyethylene plants

Sustainability Profile

- Produces 1/7th the amount of CO₂
- Most “waste” is used in the process
- Harvesting rainwater
- Trees adjacent to fields reduce soil erosion
- Recyclable using existing infrastructure
- Economic development



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24

HIPPO: Dow & BASF's NEW PROPYLENE OXIDE PROCESS

Economic & Environmental Benefits



Simpler raw material integration

- Uses hydrogen peroxide and propylene
- 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



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PROPYLENE GLYCOL RENEWABLE (PGR)

Economic & Environmental Benefits



Propylene glycol made from glycerine

- Glycerine is generated during the manufacture of biodiesel
- Biodiesel is a diesel-fuel alternative made from vegetable & seed oils
- PGR delivers dependable quality and is suitable for industrial applications such as UPRs

Sustainability Profile

- Conserves finite fossil fuels
- Reduces dependence on oil
- Consumes less water during manufacturing than conventional propylene glycol
- Creates value from a manufacturing byproduct

Producing PGR from Glycerine

Vegetable and Seed Oils
Sunflowers, Soybeans, Canola or
Recycled Cooking Oil

Transesterification

Biodiesel
Methyl esters

Glycerine

PGR



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26

RENUVA™/SOY-BASED POLYOLS

Economic & Environmental Benefits



Natural Oil-based Polyols

- Dow's technology
- Eliminates odors typically associated with soy-based products
- Delivers processing and performance with high levels of renewable content



Sustainability Profile

- Greenhouse gas neutral
- Uses up to 60% fewer fossil fuel resources than conventional polyol technology



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27

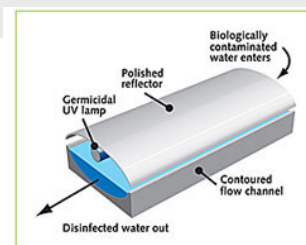
WATERHEALTH INTERNATIONAL

Economic & Social Benefits



Unique Business Model

- Total service, turn key system
- System finance/operation
- Ownership passes to village in 8 years
- Patented, low cost UV technology
- Modular systems serving 2-10 thousand people
- Close working relationship with local NGO & village government



Sustainability Profile

- Affordable water for those earning \$2 per day
- Revenue stream sufficient for long term viability
- Innovative use of Dow capital to enable clean drinking water in rural areas



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28

HEALTHY OILS

Social Benefits



Omega-9 Oils

- Made from NEXERA™ canola and sunflower seeds
- Used for foodservice, frying, and consumer packaged goods products



Sustainability Profile

- Zero Trans Fat
- Lowest saturated fat
- Light, Clean Taste and Superior Performance



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29

DOWFROST PART OF EPA GREENCHILL PARTNERSHIP

Environmental Benefits



DOWFROST™ Heat Transfer Fluids

- Dow has signed on to U.S. EPA GreenChill Advanced Refrigeration Partnership
- Product complies with government regulations for food application
- Enables secondary loop refrigeration systems to operate

Sustainability Profile

- Reduces use of refrigerant gas, an ozone-depleting substance, by more than 50 percent
- Contributes to energy consumption reduction of up to 24%
- Contributes to program achievement of 2.5 million metric tons of CO2 reduction since Nov 2007



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30

PROCESS TECHNOLOGY OF THE FUTURE – CHEM ENGINEERS



- Process design and synthesis
- New unit operations/process intensification
- Alternative raw materials
- Sustainable chemistry
- Breakthrough mentality (set stretch goals for important elements)
- We need different approaches and new assumptions to address these needs
- Must be applicable across geographies



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31

COMMITTED TO SUSTAINABILITY



- Industry Leader on Dow Jones Sustainability Index
- ENERGY STAR Partner of the Year for 2008, U.S. Environmental Protection Agency
- More U.S. Presidential Green Chemistry Awards than any other company, U.S. Environmental Protection Agency
- Global Citizenship Award, The Whitehead School of Diplomacy and International Relations
- Award for Energy Efficiency, Alliance to Save Energy (ASE)
- 100% rating on the Corporate Equality Index, Human Rights Campaign
- Best Global Company Performing CSR in China, Foreign Investment in China Magazine
- New Freedom Initiative Award for our programs pertaining to people with disabilities, U.S. Department of Labor

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32



COMMITTED TO SUSTAINABILITY



- Awarded \$20 million in funding from the U.S. Department of Energy to develop next generation solar energy technology that can be directly incorporated into flexible building materials
- Indonesian Nehemiah Award, Habitat for Humanity
- Platinum Award for Healthy Lifestyles, National Business Group on Health
- “100 Most Technologically Significant New Products of the Year” for IMPAXX™, R&D Magazine
- “Safety Innovation of the Year” Award for IMPAXX™, Professional MotorSport World Expo
- Signatory of UN Global Compact, Caring for Climate and CEO Water Mandate
- Corporate sponsor UN Environment Programme Champions of the Earth & Business for the Environment Summit

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33



COMMITTED TO SUSTAINABILITY



- Joined with the UN Foundation and The Alliance to Save Energy to promote energy efficiency
- Active member of the U.S. Climate Action Partnership
- Supporter of Habitat for Humanity International since the early 1980s. Last year alone, Dow supplied building and construction materials for more than 3,000 Habitat for Humanity homes
- Founding member of Global Water Challenge for awareness of clean drinking water issues
- Working with Lawrence Berkeley National Labs and China’s Energy Research Institute to improve the energy efficiency of small- and medium-sized companies in China
- Sponsor of the national pilot project with China’s State Environmental Protection Administration recognizing the project’s economic benefits of \$13 million, and reduced gas emissions, energy consumption, liquid and solid waste
- Helped Live Green, Live Smart’s *The Sustainable House* achieve LEED Platinum Status

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34



COMMITTED TO SUSTAINABILITY



- Collaborative partner with China's State Administration of Work Safety for a national demonstration project on the safe management of hazardous chemicals promoting a better understanding and awareness among small- and medium-sized enterprises
- Collaborative partner with International Aid to provide 2.1 million pounds of plastic for 300,000 light-weight bio-sand filters giving 2 million people access to clean drinking water over the next 3 years
- Investor in Water Health International and provided \$30MM loan guarantee to help finance local water treatment systems and make clean drinking water available to 10 million people in rural India
- Dow Automotive is exclusive provider of energy absorbing foam solutions for NASCAR's new safety-driven "Car of Tomorrow" Project

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35



TRACK OUR PROGRESS



At Dow, we have always believed that the role of chemistry is to do more good in the world.

- We've set aggressive 2015 Sustainability Goals in **each** area of our sustainability program.
- Seen this way, the work of chemistry suddenly moves from focusing on the basics of business – products and bottom lines – to life itself.
- In short, we are committed – through chemistry – to the betterment of global humanity. And it is this commitment that drives all of our strategy for growth and profitability.
- Track our progress at www.dow.com/commitments

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36

Responsibility Begins Here

“**Sustainability** begins at home, but its destiny is to engage the problems of the world. We will build on our company’s rich legacy of leadership in solving the world’s most pressing problems.”

-- Andrew Liveris,
Chairman & CEO
The Dow Chemical Company

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37



ADDITIONAL EXAMPLES

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39

HERCULEX™ TRAITS

Environmental Benefits



In-plant insect protection

- Higher yields
- Less loss due to feeding damage by insects such as corn rootworm, European corn borer, western bean cutworm and black cutworm

Sustainability Profile

- More effective use of agricultural land
 - Leads to preservation of non-agricultural land



HEAT TRANSFER FLUID REDUCES GHG EMISSIONS

Economic & Environmental Benefits



DOWFROST™ Heat Transfer Fluid

- Wal-Mart's experimental super store in Colorado
- System minimizes amount of refrigerant
- Plastic piping instead of copper
- Comparable cooling performance
- Supports regulatory compliance



Sustainability Profile

- Reduces refrigerant leaks
- Reduces maintenance costs by 50%
- Reduces energy consumption by up to 24%

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41

PROTECTED MEMBRANE ROOF SYSTEM

Environmental & Social Benefits

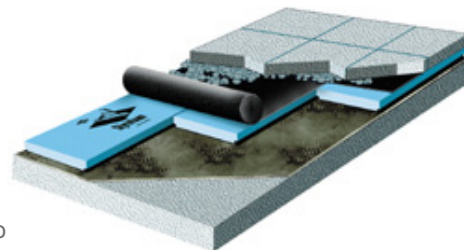


Shields and protects roof's waterproof Membrane

- Uses STYROFOAM™ Insulation
 - Protects against weather, foot traffic and temperature fluctuations due to sunlight, and extreme heat and cold
 - Stays cooler than black surfaced roofs; helps reduce heat island effect

Sustainability Profile

- Energy Efficient
 - High long-term "R" Value
- Helps conserve landfill space
 - Lasts over 30 years compared to 7 to 10 fo insulation can be reused if roof is replaced



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42

INDUSTRIAL STRETCH FILM

Source Reduction & Recycling



Use 25+% less resin in last decade

- Improvements in resin design and processing
- Global market size of
 - 3 billion pounds/yr
 - This saves over 1 billion pounds per year of PE



Sustainability Profile

- Not Producing 1 billion pounds of LLDPE* saves
 - Equivalent to 293 million gallons of gasoline
 - Enough energy to heat and cool 643,000 homes for a year

* US EPA

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43

PERFORMANCE FLUIDS ENABLE SOLAR POWER

Economic, Social & Environmental Benefits



DOWTHERM™ A Heat Transfer Fluid

Technology allows large-scale solar thermal energy

- Used in Thermal Power Plants, including world's largest, in Spain
- Absorbs and transfers heat energy to power electricity-generating turbines



Sustainability Profile

- Energy produced by three plants enough to power 90,000 homes
- Two that are close together save 450,000 tons of carbon dioxide emissions compared to traditional fuels

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44

HOUSEHOLD WASTE WATER USE AT TERNEUZEN SITE

Economic, Social & Environmental Benefits



Dow uses municipal household waste water

- Re-use of water previously discharged directly to the river
- Used twice at Dow

Sustainability Profile

- Almost 10 million liters of water per day
- 65 % less energy than desalinating sea water with the same membrane technology
- Equal to lowering CO₂ emissions by 5,000 tons per year
- Reduced need of chemical cleaning of membranes
- Concept can be leveraged at other locations around the world.



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45

USING METHANE LANDFILL GAS

Economic & Environmental Benefits



Landfill methane used for production of carpet latex

- LOMAX™ Technology
- Renewable energy
- Reduces Dow's use of fossil fuel
- Methane into the atmosphere reduced
- One ton of methane = 23 tons of CO₂



Sustainability Profile

- Energy saved would power 2,100 US homes
- Prevents the use of >200,000 barrels of oil
- CO₂ reduction equal to keeping 2,300 cars off the road/year



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46

EPICHLOROHYDRIN FROM GLYCERINE

Economic, Social & Environmental Benefits



Uses by-product of biodiesel process

- Applications
 - Electronics
 - Appliances
 - Coatings
 - Construction



Sustainability Profile

- Clean, simple
- Low cost, small footprint, low capital
- Waste water reduced by 70 percent



World-scale plant in China, 2010

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47

PLANT-CELL-PRODUCED VACCINES

Environmental & Social Benefits



CONCERT™ Plant-Cell-Produced Vaccines

- Eliminate the risk of animal virus contaminants associated with current production systems
- Can be targeted against the specific parts of the disease agent that are required for immunity since only the subunit goes into the vaccine

Sustainability Profile

- Are produced in a totally bio-contained process – a sealed and sterile environment
- Are highly stable and thus provide storage and handling advantages along with consistent performance



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48



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49