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

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.
**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**

**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*
**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%

**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**
**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**

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.

**Goal Objectives**
**INTEGRATING 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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**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

Solutions
## 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](http://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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## 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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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

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.
**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

**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
**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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**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

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**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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**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
Energy Absorbing Foam Protects Drivers
Environmental & Social Benefits

**IMPAXXTM 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

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
**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

**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
**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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**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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**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

**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
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

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
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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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
**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.

**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](http://www.dow.com/commitments)
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
**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

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**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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**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 for traditional; STYROFOAM™ insulation can be reused if roof is replaced

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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

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
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.

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
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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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
References to "Dow" mean The Dow Chemical Company and its consolidated subsidiaries unless otherwise expressly noted.