

Environment

Working toward a cleaner future, with customers in mind



Climate change is one of the most widely-discussed topics in our society. Everyone everywhere, has become part of the national debate on this issue. While we all realize the magnitude of the challenges, there are no easy answers. However, one thing is certain. The time for debating whether or not to act has passed.

DTE Energy is keenly aware that the energy we produce impacts the environment. While it's imperative that we maintain a diverse fuel mix for our customers and the communities we serve, we're dedicated to taking action now to preserve our natural resources. Our approach to environmental management focuses on making smart choices to minimize these impacts – on the world around us as well as on our customers.

Our environmental commitment takes many forms, from investing in emission control equipment at our plants to fostering renewable energy forms and helping to write effective policies and legislation. We're working hard toward a cleaner, greener future – but we're doing it with our customers in mind. Our approach is high-tech, using new ideas and cutting-edge innovation, and low-tech – planting trees and cleaning shorelines.

Our strategy is working.

DTE Energy's environmental mission

At DTE Energy, we believe that our obligation to serve our customers and the community goes beyond the delivery of safe, reliable and economical energy products and services. We are committed to enhancing the quality of life for today's society and future generations. Environmental stewardship and conservation of the earth's natural resources is at the heart of that commitment. For DTE Energy, environmental stewardship starts with managing our facilities, land and equipment in a manner that complies with or exceeds governmental standards and is protective of our employees, customers and surrounding communities.

During the last 30 years, the company has reduced its particulate emissions 87 percent, sulfur dioxide emissions 64 percent and nitrogen oxide emissions 63 percent. Even with our increase in generation, CO₂ emissions are near or at 1990 levels. As a result of our aggressive move to low-sulfur Western coal and our supplier's actions to better clean eastern coals, total power plant mercury emissions have remained relatively stable over the last 20 years despite a 6 percent increase in coal consumption.

Armed with this proven progress, we are moving forward on a path paved with ingenuity, hard work and a genuine desire to create a better tomorrow for our children – and theirs.

Preparing for Climate Change

DTE Energy has positioned itself to be a key player in shaping and influencing climate change policy and legislation.

Both Houses of Congress are actively working on climate change legislation and a number of climate change bills have already been introduced.

At the state and regional level, governors from six midwestern states – Minnesota, Illinois, Iowa, Kansas, Michigan and Wisconsin – and the Canadian province of Manitoba signed the “Midwestern Greenhouse Gas Accord.” These governors agreed to create a regional cap-and-trade program by 2010 to reduce greenhouse gas emissions by 60 percent to 80 percent by 2050.

The agreement also calls for the states to generate 10 percent of their electricity from renewable sources by 2015 and to reduce energy consumption 2 percent per year starting in 2015.

Mandatory greenhouse gas reductions will fundamentally change the structure of the electric power generating sector. In anticipation of a mandatory climate change program, DTE Energy has proactively prepared for operating in a future carbon-constrained world.

- Since 1996, we have achieved a steady decline in CO₂ emissions per megawatthour for both fossil fuel generation and our total system generation, and our net carbon emissions today are near 1990 levels. That is the goal established by the U.S. Department of Energy Climate Challenge program, which Detroit Edison joined in 1995. If we factor in the impact of landfill gas recovery and biological sequestration (tree planting), our net emissions are 10 percent below 1990 levels.
- We continue to meet that goal by concentrating our actions in the following areas:
 - Increasing nuclear energy usage
 - Energy efficiency projects
 - Landfill methane recovery projects
 - Forest carbon sequestration
- Detroit Edison made a voluntary commitment, in response to the 2002 Bush Administration industry challenge, to reduce the CO₂ emission intensity (tons/megawatthour) of electricity generation 3 percent to 5 percent by 2012.
- Detroit Edison has been a leader in forest carbon sequestration activities to develop CO₂ emission offsets. The company has planted more than 20 million trees in Michigan since 1995. In addition, we have invested almost \$8 million in forest carbon sequestration projects, including a new partnership with the Shiawassee National Wildlife Refuge near Saginaw, Mich. These projects have the potential to offset more than 11 million tons of carbon dioxide, or about 25 percent of 2005 emissions.
- The company is supporting numerous research and development projects in the areas of carbon capture and storage and emission offset creation, including:
 - Pilot Carbon Capture Project with the Electric Power Research Institute (EPRI)
 - Ionic liquids (for carbon capture) project with the University of Notre Dame
 - Oxy-combustion project (concentrates CO₂ in flue gas for easier capture) with Southern Research Institute
 - Tree planting projects in the lower Mississippi River valley with PowerTree Carbon Company
 - Agricultural nitrous oxide emission reduction demonstration project (reduced fertilizer use with no loss of crop production) at Michigan State University, also with EPRI.

We also maintain memberships in several climate change organizations, including:

- The Business Environmental Leadership Council of the Pew Center on Global Climate Change. We have been active in the development of policy on this issue for many years.

- The Michigan Climate Action Council that is responsible for developing recommendations for meeting state and regional goals for reducing greenhouse gas emissions as agreed to under the Midwestern Greenhouse Gas Accord.
- The Midwest Regional Carbon Sequestration Project, which will test the viability of a deep underground geological formation in northern Michigan for long-term carbon storage.

New Frontiers in Emissions Control

As we prepare for a future with mandatory climate change requirements, new technology is one of our most important tools for adapting to meet carbon emission limits and create a cleaner world.

Like many coal-fired utilities, DTE Energy focuses on reducing air emissions such as sulfur dioxide, nitrogen oxide, mercury and carbon dioxide, which is considered a greenhouse gas.

Sulfur Dioxide (SO₂)

Sulfur dioxide belongs to the family of sulfur oxide gases. These gases dissolve easily in water. Sulfur is an element in many raw materials including crude oil, coal and ore. Sulfur dioxide gases are formed when fuel containing sulfur (coal and oil) is burned.

SO₂ dissolves in water vapor to form acid, and interacts with other gases and particulates in the air to form sulfates and other products that at certain concentrations can be harmful to the environment.

Once it enters the atmosphere, SO₂ can form sulfuric acid, a major contributor to acid rain. In elevated concentrations it can also be a respiratory irritant and potentially aggravate existing heart and lung diseases.

Detroit Edison has a long history of striving to reduce SO₂ emissions; in fact we were one of the first utilities to use cleaner, low-sulfur Western coal to significantly reduce sulfur dioxide emission rates. We're continuing that heritage today by installing "flue gas desulfurization" equipment at our power plants.

This equipment commonly referred to as scrubbers, controls 95 percent of the sulfur dioxide emissions by injecting limestone into our emissions. This produces a marketable byproduct called gypsum.

We currently plan to install two scrubbers at our Monroe Power Plant. Monroe Power Plant is our largest coal-fired plant, and provides 30 percent of our generation capacity. Our data suggests that installation of one scrubber at our Monroe Power Plant will control 12 percent of the forecasted fleet sulfur dioxide emissions.



Flue gas desulfurization equipment, commonly known as scrubbers, controls 95 percent of the sulfur dioxide emissions at our power plants.

90 percent of nitrogen oxide emissions at Monroe Power Plant are controlled by our SCRs

Nitrogen Oxides (NOx)

Nitrogen oxide emissions form when fuel is burned at high temperatures. The primary man-made sources of NOx are motor vehicles, electric utilities and other industrial, commercial and residential sources that burn fuels.

NOx emissions have been identified as a precursor to ozone and fine particulate, both of which at elevated levels in the air can be associated with respiratory disorders, damage to vegetation, and corrosion and degradation of materials.

Our overall NOx reduction strategy is to install a combination of NOx control technologies on a number of units within power plants across our fleet.

These technologies include:

- Installing sophisticated boiler controls that minimize the presence of excess air in the furnace
- Modifying or replacing existing burners in favor of new burners that slow combustion
- Introducing new chemicals that slow the rate of combustion and reduce NOx formation

These technologies and others, are used at some of our plants where practical. These alone, however, do not reduce our NOx emissions enough to comply with regulations. So, we've installed Selective Catalytic Reduction equipment (SCRs) at our Monroe Power Plant. Each unit will control more than 90 percent of emissions.

Currently, three of the units at our Monroe Power Plant have SCRs.

The equipment introduces ammonia in the presence of a catalyst which converts the NOx to an inert nitrogen and water mix.

Currently, SCR is the only technology that can achieve NOx reduction efficiency in excess of 65 percent.

We are continuing to evaluate alternative NOx control technologies. Many of these are, however, in the early stages of development and remain unproven.

Mercury

Coal contains mercury that is released during combustion. Human exposure to mercury is generally associated with the consumption of contaminated fish.

Our main forms of mercury control are SCRs and scrubbers. An SCR and a scrubber installed together will control an estimated 80 percent of mercury emissions.

Additionally, we are investigating other forms of mercury control, using a variety of chemicals, filters and equipment designed to either bind with or reduce the amount of mercury emitted by our power plants.

Our challenges are complex. For example, one method used to remove mercury from fly ash (a byproduct of coal-fired energy production) involves adding carbon to the fly ash. For years, DTE Energy has sold a portion of its fly ash to the cement industry. Fly ash is used as an additive to concrete. However, adding too much carbon contaminates the fly ash so that it cannot be used by the construction industry and must be transferred to landfills.

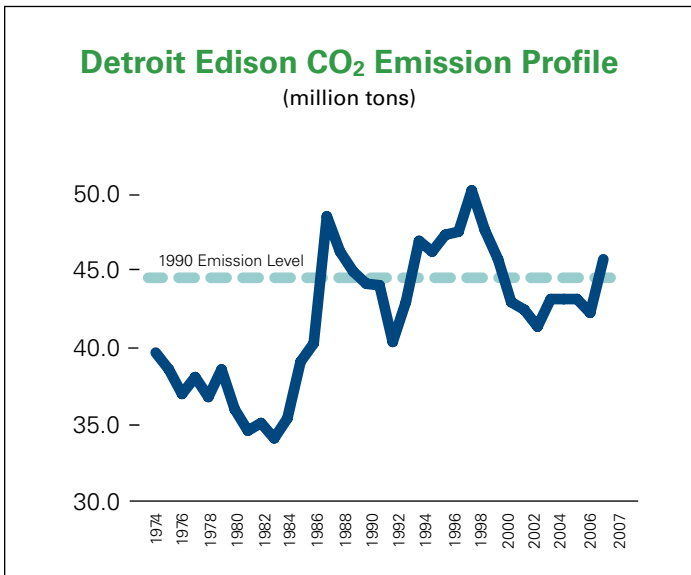
What are coal emissions?

DTE Energy generates about 77 percent of its electricity by using coal. To produce nearly 45 million MWh of electricity – enough to serve the needs of 5 million people in their homes, businesses and industries – Detroit Edison (DTE Energy's electric utility) burns approximately 20 million tons of coal annually.

This coal contains almost every chemical element (most only in trace amounts) and when the coal is burned, it creates emissions of concern including sulfur dioxide (SO₂), nitrogen oxide (NOx) and particulates, mercury (Hg), and carbon dioxide (CO₂). Carbon dioxide is a greenhouse gas believed to contribute to global climate change.

\$219 million

was spent in 2007 and we expect to spend an estimated \$2.4 billion in the future to meet new emission reduction requirements



Carbon Dioxide (CO₂)

We're working on many fronts to find effective, workable solutions to reduce CO₂ impacts. Our approach involves an emphasis on reforestation – we're planting trees by the thousands – and also a focus on technology.

We're involved in a research program, in conjunction with Notre Dame University, designed to test the effectiveness of injecting certain chemicals into our CO₂ exhaust stream. In general, the chemicals bind with and allow for more efficient capture of CO₂ being emitted. Our energy experts are providing power plant expertise as well as input on the new technology and its costs.

We've also partnered with Batelle Laboratories, Western Michigan University and several other organizations on a carbon "geologic sequestration" project.

This project, called the Midwest Regional Carbon Sequestration Partnership, is one of seven partnerships in the Department of Energy's Carbon Sequestration Program. The project involves injecting liquid carbon into underground formations to demonstrate the safety and effectiveness of carbon sequestration and the feasibility of sequestering in the Michigan Basin. We have plans to inject 10,000 tons of carbon dioxide into a formation in northern Michigan. We're continuing to gather data, to

learn and to mitigate local concerns about environmental impacts as this project moves forward.

Our overall goal is to drive creative and innovative solutions that will help our company, our industry and our world navigate the complex challenge of climate change.

Emissions trading and reduction

In 2001, Detroit Edison agreed to participate in the design phase of the Chicago Climate Exchange (CCX), a pilot greenhouse gas emissions reduction and trading program. Since then, the CCX has become North America's only voluntary, but legally binding, greenhouse gas emissions reduction program.

CCX's commitment was that by July 2005 the members' CO₂ emissions would be below 1999 levels. DTE Energy exceeded that goal – we dropped to 1990 levels.

We view CCX as an opportunity to investigate emissions trading programs.

What are emissions trading programs?

Emissions trading is an approach to controlling emissions levels nationwide. The Environmental Protection Agency sets a limit, or a cap, on the amount of certain chemicals that can be emitted. Companies whose operations emit that chemical are required to hold an equivalent number of allowances, or credits, which represent the right to emit a specific amount. The total amount of credits cannot exceed the cap, limiting total emissions to that level. Companies that need to increase their emissions must buy credits from those who create fewer emissions. The transfer of these allowances, or credits, is called "emissions trading." In effect, the buyer pays more for emitting higher levels of chemicals, while the seller is rewarded for reducing emissions.

For more information on the Chicago Climate Exchange, visit their Web site at chicagoclimateexchange.com.

Cap and Trade Versus Carbon Tax

A cap and trade system is a market driven mechanism for reducing emissions of a pollutant such as carbon dioxide as opposed to the more traditional command and control type regulations utilized by regulatory agencies.

A cap and trade system establishes a firm cap on allowable emissions and this cap is reduced over time to achieve the emission reduction goals. Each emitting facility is given a cap on its emissions (e.g. tons per year). If the facility's emissions exceed the cap, then the facility must buy permits or allowances to emit the quantity of the regulated pollutant above the cap. Similarly, if a facility owns extra allowances and does not exceed its cap, it may sell those allowances at the going market price.

The main benefit of a cap and trade program for reducing emissions is that it provides emissions reduction certainty because all affected sources are capped, and the caps are reduced over time. In addition, a cap and trade program provides flexibility to the regulated emitters on how they choose to meet the cap (i.e. by reducing emissions or buying allowances). Market drivers in a cap and trade system also spur innovation and reward companies that achieve cost effective emission reductions.

A carbon tax has also been proposed as a mechanism for reducing emissions of greenhouse gases. A carbon tax provides economic incentives for reducing energy consumption and may be simpler to administer than an economy-wide cap and trade program but there is no guarantee that actual emissions will decrease under a carbon tax. Depending on the level of the carbon tax, facilities may simply choose to pay the tax instead of reducing emissions.

Environmentally-Focused Business Partnerships

In 1997, Detroit Edison became a founding member of the Michigan Business Pollution Prevention Partnership.

The organization encourages businesses to apply creative, cost-effective techniques to reduce waste and prevent the release of hazardous substances.

As part of our voluntary membership, Detroit Edison has committed to reducing its carbon dioxide emission intensity by 3 percent to 5 percent by 2012. Reductions are based on data taken during a baseline period from 2000 to 2002. This effort involves setting a series of environmental protection goals for each of DTE Energy's power plants.

We are currently on target to hit our goal.

Fostering renewable energy

Our electric utility, Detroit Edison is now offering its electric customers a chance to do their part in preserving the environment.

The program, called *GreenCurrents*, offers customers the chance to support electricity generation from clean sources such as wind and biomass energy.

GreenCurrents program participants can select a renewable energy option that best fits their budget. For as little as \$2.50 a month, residential customers can purchase a 100-kilowatt-hour block of renewable energy



GreenCurrents program manager Dennis Mullan helps Elizabeth Chilton sign up for the *GreenCurrents* program.

that's equal to 15 percent to 20 percent of a typical home's monthly electric usage. Customers can also choose to match 100 percent of their home's electricity consumption with renewable resources.

Business customers can purchase a 1,000-kilowatt-hour block of green energy for \$20 a month – or match all of their electricity usage with renewable power for an additional cost of 2 cents per kilowatt-hour.

Every customer who signs up for *GreenCurrents* will play a significant role in shaping the future of sustainable energy in Michigan. By increasing the development of renewable energy projects, our customers can help us meet the electricity demands of today without sacrificing the needs of future generations. More than 6,800 customers signed up for *GreenCurrents* in 2007.

As part of the *GreenCurrents* program, we've inked agreements with several companies, including one that turns cow manure into usable electricity and another wind energy company based in Northern Michigan.

Some of our most important challenges lie in striking the correct balance between producing affordable energy and embracing environmental stewardship. Programs like *GreenCurrents* are helping us achieve both goals and take a huge step in the right direction.

Other Environmentally-Friendly Energy Sources

Beyond our coal and nuclear plants, DTE Energy is investing in several different forms of environmentally-friendly energy.

This includes biomass energy, which literally turns trash into energy. When solid waste decomposes in a landfill, a gas composed of methane and carbon dioxide is produced. Methane is a powerful greenhouse gas – 20 times more potent than CO₂. DTE Biomass Energy captures the methane in landfills and abandoned coal mines and converts it into a renewable source of energy that can generate steam, electricity or fuel for industrial processes or pipeline-quality gas.



Since 1995, DTE Biomass Energy projects have replaced more than 17 millions barrels of foreign oil, benefiting the environment, the landfill owner and the nation.

Since 1995, DTE Biomass Energy projects have replaced more than 17 million barrels of foreign oil, benefiting the environment, the landfill owner (usually a township, city or village) and the nation.

In addition to our involvement in Biomass, we're also currently assessing the feasibility of a 30,000-plus acre wind development that could provide power to customers in Southeast Michigan.

This \$1.2 billion investment would be the largest wind-energy project in Michigan. We've purchased the easements to more than 30,000 acres in Michigan and have currently erected towers that measure wind speed and frequency. The 30,000 acres could accommodate about 300 wind turbines that would generate about 600 megawatts of electricity – enough to power about 175,000 homes.