2005 Community Energy Planning Mission to Germany
Background Information on Site Visits*

*Includes background and/or historical information on most sites. A glossary of the most common terms that will be used on the Mission is found on the last page.

Monday August 22

Presentations on the **German Ministry of Environment, Nature Conservation and Nuclear Safety**, and on the **German and Berlin Energy Agencies** will be held Monday. Some general information on German environmental initiatives is provided below.

In 1994-95, former Secretary of State of the former Berlin Senate Environment Administration raised the basic idea of energy conservation partnerships. The Berlin Energy Agency (Berliner Energieagentur) was commissioned by the senate administration to develop and test the idea.

The Berlin 'energy partnership' is a model of effective energy-efficiency (performance) contracting. It was developed to meet climate and energy policy goals despite very tight budgets, while at the same time saving costs. In Berlin, the idea was to aggregate several buildings to a pool. Such pools comprise buildings with different use structures, structural states, equipment, and savings potentials. This allows contractors to engage in profitable pricing, while at the same time ensuring that seemingly unattractive buildings are not left out.

Source: www.german-renewable-energy.com. This Web site also has several other downloadable documents related to renewable energy supply and trends.

Tuesday August 23

1. The **Müllheizkraftwerk Rothensee GmbH** waste to energy plant is located in an industrial area of Magdeburg. The plant has the capacity to process 300,000 tonnes of domestic, commercial and industrial waste each year, producing 35 megawatts (MW) of electricity and 75 MW of thermal power. The total cost to build the plant was roughly 130 million Euros (~$193 million CAD) and complies with EU policy and legislation. Source: www.eib.eu.int/projects/pipeline/project.asp?pipe=678&style=printable

2. **Enercon GmbH** was established in 1984 and pioneered the development and manufacture of the world's first gearless wind energy system. It has installed over 8,000 wind turbines worldwide for a total power output of 7.5 gigawatts (GW). Its latest rotary blade has an inner section that is "hollow paddle shaped" that takes advantage of the inner part of the rotor area for improved air flow and increased energy capture. Source: The company's brochure can be downloaded at: www.enercon.de/en/_home.htm. Click on "Downloads" on the right side of the screen.

Wednesday August 24

1. **Solarthermal-Anlage** is a solar thermal facility for housing companies in Berlin and Brandenburg. Different from photovoltaic plants (which convert solar energy into electricity), solar thermal systems convert solar radiation into heat using solar collectors. The heat is then used for heating water or for room heating. Aside from the collectors, the facility uses a heat accumulator and is integrated into the rest of the building automation systems. Source: Berlin Energy Agency, www.deutsche-energie-agentur.de/page/index.php?id=717&L=4

2. **The International Solar Centre (Stiwa GmbH & Co.)**, completed in 2003, combines an historic building with customized office space and the Berlin Energy Forum exhibition area. It features high thermal insulation, innovative glazings, shading systems, and a natural ventilation system in summer. Seasonal heat storage, combined with a heat pump and a concrete core heating and cooling system provides 20% of the building's heating demand and 100% of its cooling demand. Photovoltaic panels produce an estimated 46 MWh annually. Source: University of Sydney, Australia, www.arch.usyd.edu.au/web/general/whatson/pdf/TNL_sept13_05.pdf

3. **Gemeinnützige Siedlungs- Und Wohnungsbaugesellschaft Berlin mbH (GSW)** is a 22-storey office tower built to adapt to variations in climate. It has a central building management system (BMS) that controls all key elements of the environmental system and responds automatically to climatic conditions. For example, the BMS controls airflow and makes recommendations to users about the selection of natural or mechanical ventilation. The building is naturally ventilated for 70% of the year and its outer double walls prevent heat loss. Air extracted from the building is returned to a central plant room located just under the roof and the heat is recovered for use in winter. Source: Architecture Week. An in-depth article on all of the building's systems can be found at: www.architectureweek.com/2003/0813/environment_1-1.html

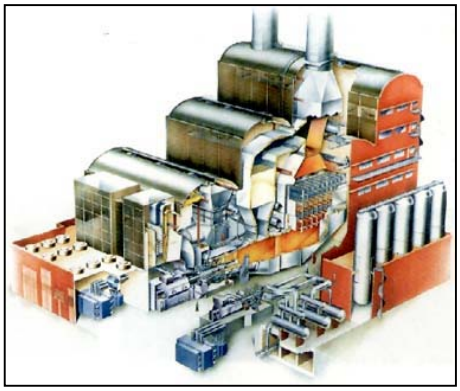
Thursday August 25*

*No English information could be located for Kommunales Wirtschaftsunternehmen-KWU

1. The **Biogas Kraftwerk** biogas plant and filling station was commissioned in 1998 and turns household, industrial and agricultural wastes from Berlin and Brandenburg into biogas. The plant is designed to process up to 85,000 tonnes of waste per year. The biogas is used to heat and power up to 2,000 homes, while the remaining biosolids are used as fertilizer. Two biogas reactors, each with a volume of 3,300 m^3, transform the waste into biogas at a temperature of 55°C. Up to 600 m^3 of biogas is produced every hour, representing up to 1.34 megawatts of electric power and up to 2 megawatts of heat. Source: www.bkw-fw.de (German only, but for a downloadable company brochure in English)

2. The **Senate Department of Urban Development** is responsible for planning, building, housing, environment, protection of plants, geoinformation and monuments. The city's energy policy has a goal of reducing GHG emissions by 25% by 2010, compared to 1990 levels. It actively works on projects related to housing, public buildings, industry and trade, and energy services including renewable energy and conservation. Source: www.stadtentwicklung.berlin.de/umwelt/index_en.shtml

Friday August 26



1. **Bewag Aktiengesellschaft Heizkraftwerk Mitte** is a thermal power station in Berlin. Its energy sources are natural gas or light fuel oil and the plant produces 380 megawatts of electrical energy and 620 MW of thermal power, replacing the power supply from coal-fired power plants. Since its completion in 1997, the plant has reduced over 1 million tonnes of CO_2 emissions per year. The plant supplies heat to over 80,000 households and 500 public buildings. During the off-season period, the thermal energy of the plant is used to cool the new buildings at Potsdamer Platz. Source: www.stadtentwicklung.berlin.de/umwelt/klimaschutz/berlin_spart_energie/en/energie-dienstleistungen/heizkraftwerk_berlin_mitte.shtml

2. By using the latest technologies and concepts in the **German Parliament**'s buildings, energy consumption and emissions, of carbon dioxide in particular, are to be kept as low as possible. High-grade heat insulation and the passive use of solar energy ensures that limits set by the federal ordinance on heat conservation are complied with. Extensive use of natural lighting and energy-saving artificial lighting technology limits the need for electric energy. With respect to energy supply, the German Parliament uses an integrated heating, cooling and power-generating system, similar to those used in the modern block-type thermal power stations. Source: www.bundestag.de/htdocs_e/info/099berlin/energy.html

Although not part of the official site visits, the **Berlin Botanical Gardens** is one of the largest and most diverse botanical gardens in the world. It was completed in 1910 and has over 23,000 different species of plants on 43 hecatares. For a sneak preview of what you will see, visit the garden's Web site at www.bgbm.org/BGBM/overview.htm

Glossary

Biogas
Typically refers to methane produced by the fermentation of organic materials (manure, agriculture and food industry wastes, wastewater sewage sludge, etc.) under anaerobic conditions. *Also known as biofuel; if only crops are used in the process, it is sometimes referred to as "crop gas."*

Biomass
Any organic non-fossil material of biological origin, e.g., plants and animals as well as the materials they produce, such as wood or manure.

Biosolids
The solid material that remains from a fermentation process (either from biogas production, wastewater sewage, etc.). Often used as fertilizer. Can be solid, semi-liquid, or liquid. *Also known as biofertilizer.*

CHP
Combined heat and power (CHP) is a system that generates electricity and thermal energy in a single, integrated system. *Also known as cogeneration.*

District cooling system
A type of energy system that uses chilled water to cool several buildings via an underground pipeline network.

District heating system
A type of energy system that uses hot water or steam to heat several buildings via an underground pipeline network. *Also known as district energy or community energy systems.*

Gasification
A chemical or heat process used to convert solid materials, such as wood, charcoal or other biomass materials, into a gas for use as fuel or electricity generation. Gasification can be used to make synthetic fuels or "synthesis gas" as well as chemicals such as methanol, ammonia, diesel fuel and gasoline.

LA21
Local Agenda 21 (LA21) is an international program that encourages local governments to prepare sustainability plans.

Producer responsibility
Regulations that require companies to recover and recycle the waste they produce. Products include paper, metal, glass, tires and automotive parts, electronic waste ("e-waste"), etc. *Also known as extended producer responsibility.*

Waste-to-energy
A process that converts any waste product to energy and/or electricity.