Break up of Ross Ice Shelf, March 2000

[Images of the break up of Ross Ice Shelf]
Upsala Glacier, Patagonia

1928
Upsala Glacier, Patagonia

1928

2004
Franz Josef Glacier, New Zealand
Franz Josef Glacier, New Zealand
Franz Josef Glacier, New Zealand
Franz Josef Glacier, New Zealand
Franz Josef Glacier, New Zealand
Other consequences of global climate change
Increased intensity and costs of severe weather.

Cyclone Catherine
March 29, 2004

Utica, IL
April 21, 2004
2004 Hurricane Season:
• Jeanne
• Ivan
• Frances
• Charley
2004 Hurricane Season:
  • Jeanne
  • Ivan
  • Frances
  • Charley

2005 Hurricane Season:
  • Katrina
  • Ophelia
  • Rita
  • ?
Historic Atmospheric CO2 concentration in Mauna Loa, Hawaii

Source: Scripps Institution of Oceanography (SIO), University of California, 1998.
Growth in U.S. Energy Consumption Is Outpacing Production

(Quadrillion Btus)

Energy Consumption

Projected Shortfall

Energy Production at 1990-2000 Growth Rates

U.S. Energy Information Administration, 2001
A FIGURE 13-9 Pathways from primary energy sources to end uses. Only major pathways are shown. Note that end uses are connected to primary sources in specific ways. Note also the large percentage of energy that is wasted as a large portion of the energy consumed is converted to heat and lost. (Source: Data from Energy Information Administration, U.S. Department of Energy, Annual Energy Review 1999, September 2000.)
According to the American Lung Association asthma hospitalizations in the Bronx for children under age 15 are higher than any other borough in the city.
“Our ignorance is not so vast as our failure to use what we know.”

Marion K. Hubbert
The U.S.A. has 4.6% of the world’s population and produces 21% of Gross World Product but uses 26% of the world’s oil.

Rocky Mountain Institute, 2002
TRANSPORTATION POLICY...
TRANSPORTATION POLICY...

BEGETS ENERGY POLICY...
TRANSPORTATION POLICY... 

BEGETS ENERGY POLICY... 

BEGETS FOREIGN POLICY...
7 Days, 208 Iraqis Killed

Figures based on reports from the Iraqi government, hospitals, U.S. military, news agencies and Iraqis employed by The New York Times. They do not include the Kurdish region.
Fuel Efficiency of Light Vehicles Has Remained Flat

(Miles per Gallon)

New Cars

Combined

New Trucks

U.S. Energy Information Administration, 2001
Understanding the Power Grid

In some ways, electrical power is like the air: Consumers never think about it until it disappears. But the process of getting electricity from power plants to individual homes across the country is a highly detailed process.

1. Local utilities create electricity at power plants, usually via a spin turbine or nuclear reactor.

2. Electricity travels via high-voltage lines to a transmission substation, where it is converted to extremely high voltages for long-distance travel.

3. Once off the transmission substation, the electricity is stepped down to about 7,200 volts. This usually occurs at a power substation.

4. At the power substation, electricity moves to a transformer, where it is sent out via power lines in a number of directions at a number of voltages.

5. Electricity continues along power lines until it reaches individual homes, where a transformer drum reduces the electricity from 7,200 volts to 240, the normal household voltage.
Without Power

A list of other significant blackouts that have hit cities in North America.

The Manhattan skyline is dark during the massive power failure of November 1965.

• **NOVEMBER 1965, Northeastern United States and Ontario, Canada:** Cascading power failure leaves 30 million without electricity.

• **JULY 1977, New York City:** Lightning knocks out power, leaving millions without electricity. About 4,500 arrested during ensuing riots.

• **MARCH 1989, Quebec, Canada:** Solar storm knocks out a power transformer and plunges province of Quebec into darkness.

• **SEPTEMBER 1989, Alabama, South Carolina:** Hurricane Hugo, with maximum winds of 160 mph, leaves about 696,000 without power.

• **JANUARY 1998, New York, northern New England, parts of Canada:** Massive ice storm leaves 3 million people without electricity.

• **JANUARY 1999, Southern United States:** Hurricane Georges rips through Florida Keys and central Gulf Coast, leaving 669,000 without power.

• **JULY 1999, New York City:** A spike in power demand leads to a 19-hour blackout affecting 200,000 in Manhattan.

• **JUNE 2000, California:** Gov. Gray Davis imposes rolling blackouts in different parts of the state.

• **DECEMBER 2002, South Carolina:** Massive ice storm tears through the Midwest and Southern states, leaving at least 1.2 million without power.

*Source: Reuters*
Amory Lovins,
Rocky Mountain Institute
Typical Electricity Weekly Demand Cycle
renewable energy sources forecast

installed capacity (MW)

350,000

262,500

175,000

87,500


- Solar - Thermal electric
- Solar - Photovoltaic
- Geothermal
- Small hydro
- Wind
- Biomass

Based on Arthur D Little estimates
Worldwide PV Markets by Geography

PV Markets By Geography (MW)

Source: MarketBuzz 2003

ROW | Japan | Germany | USA
Renewables remains a small part of the nation’s overall production of energy.

Source: U.S. Dept. of Energy, 2002
Renewables remains a small part of the nation’s overall production of energy. We must change this.

Source: U.S. Dept. of Energy, 2002
Our mission is to promote a stronger economy and a healthier environment through education, training and community involvement.