1. What are some advantages of using fossil fuels?
   Fossil fuels are the most economically available source of power for both personal and commercial use. Fossil fuels are what run our cars and electricity.

2. Why do experts describe the rate of fossil fuel use as “unsustainable”?
   Some believe that the world has already reached its peak for oil extraction and production, and that it is only a matter of time before natural gas and coal follow suit.

<table>
<thead>
<tr>
<th>Renewable Energy Resource</th>
<th>Description</th>
<th>Environmental Impacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solar</td>
<td>Most renewable energy comes either directly or indirectly from the sun. Sunlight, or solar energy, can be used directly for heating and lighting homes and other buildings, for generating electricity, and for hot water heating, solar cooling, and a variety of commercial and industrial uses.</td>
<td></td>
</tr>
<tr>
<td>Wind</td>
<td>The sun’s heat also drives the winds, whose energy is captured with wind turbines. The Earth’s rotation also contributes to the winds, particularly through the Coriolis effect.</td>
<td></td>
</tr>
<tr>
<td>Biomass</td>
<td>Along with the rain and snow, sunlight causes plants to grow. The organic matter that makes up those plants is known as biomass. Biomass</td>
<td></td>
</tr>
</tbody>
</table>
can be used to produce electricity, transportation fuels, or chemicals. The use of biomass for any of these purposes is called biomass energy.

| Hydrogen       | Hydrogen also can be found in many organic compounds, as well as water. It's the most abundant element on the Earth. But it doesn't occur naturally as a gas. It's always combined with other elements, such as with oxygen to make water. Once separated from another element, hydrogen can be burned as a fuel or converted into electricity. Because energy is always needed to produce hydrogen, hydrogen is not in itself an energy source, but rather a way to store and transport energy, so it is often referred to as an energy carrier. |
| Geothermal     | Not all renewable energy resources come from the sun. Geothermal energy taps the Earth's internal heat for a variety of uses, including electric power production and the heating and cooling of buildings. |
| Ocean          | The ocean can produce thermal energy from the sun's heat and mechanical energy from the tides and waves. Tides are driven by the gravitational pull of the moon and sun upon the Earth, while waves are driven by winds blowing over the ocean's surface. NREL does not conduct research in ocean thermal energy or ocean mechanical energy. See the U.S. Department of Energy's Energy Savers for basic information on ocean energy. |
| Hydropower     | Flowing water creates energy that can be captured and turned into electricity. This is called hydroelectric power or hydropower. NREL doesn't perform any research in hydroelectric power technologies. For more information on hydroelectric power, see the Hydropower Basics from the U.S. Department of Energy’s Water Power Program. |

1. Why do you think renewable energy is gaining attention in the U.S.

   Because people are starting to realize how little or how much energy we actually have.

2. What do you think are the barriers that are preventing the U.S from utilizing more renewable energy sources?

   The modern technology that we have does not have the ability to get the energy that we want.
I think that the U.S and China use so much more energy because they have larger populations and more money to spend on electronics.

1. In 2011 (year), how much energy did the U.S. consume? 98.29 quads

2. In 2010 (year), what percentage of energy in the U.S. came from fossil fuels? 85.4%

3. In 2009 (year), what percentage of energy in the U.S. came from renewable sources?

Give answer in Btu and as a percentage. 10.52% and 94.9 quads

4. List the renewable energy sources that were consumed in 2006 and the percentage of total renewable energy consumed:

Source: Biomass
Percentage: 5.2%

Source: Biofuels
Percentage: 27.6%

Source: waste
Percentage: 0.3 %

Source: Wood derived fuels
Percentage: -0.1%

Source: Geothermal Energy
Percentage: 1.8%

<table>
<thead>
<tr>
<th>Country</th>
<th>Population (millions)</th>
<th>GDP (billion 2000 U.S $)</th>
<th>Energy Production (mtoe) squared</th>
<th>Electricity Consumption (TWh) squared</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S</td>
<td>307.48</td>
<td>11357.07</td>
<td>1686.40</td>
<td>3961.56</td>
</tr>
<tr>
<td>China</td>
<td>1331.46</td>
<td>2937.55</td>
<td>2048.94</td>
<td>3503.40</td>
</tr>
<tr>
<td>OECD European Country(France)</td>
<td>64.49</td>
<td>1702.03</td>
<td>129.50</td>
<td>483.32</td>
</tr>
<tr>
<td>Zimbabwe</td>
<td>12.52</td>
<td>19.78</td>
<td>8.53</td>
<td>12.80</td>
</tr>
</tbody>
</table>
State: Alaska

Quick Fact 1: They consume 899 million BTU’s a year

Quick Fact 2: It cost them $8,807

<table>
<thead>
<tr>
<th></th>
<th>Coal</th>
<th>Gas</th>
<th>Oil</th>
<th>Nuclear</th>
<th>Hydro</th>
<th>Non-Hydro renewables</th>
</tr>
</thead>
<tbody>
<tr>
<td>National percentage</td>
<td>44.5</td>
<td>23.3</td>
<td>1.1</td>
<td>20.2</td>
<td>6.8</td>
<td>3.6</td>
</tr>
<tr>
<td>My percentage</td>
<td>79.8</td>
<td>1.0</td>
<td>0.1</td>
<td>17.1</td>
<td>1.8</td>
<td>0.2</td>
</tr>
</tbody>
</table>

State: Missouri

Utility Name: Wind Current

Program Name: City Utilities of Springfield

Type: Wind

What are the projection trends for energy in the U.S until 2030?

• The Mercury and Air Toxics Standards (MATS) issued by the EPA in December 2011 was incorporated.

• The long-term macroeconomic projection was revised, based on the November 2011 long-term projection from IHS Global Insights, Inc.

• The Cross-State Air Pollution Rule (CSAPR), which was included in the Early Release Reference case, was kept in the final Reference case. In December 2011, a District Court delayed the rule from going into effect while in litigation.

1. What agencies or organizations sponsored the Web sites you collected information from and what might their bias be?
2. Do you think the information presented on the Web sites is balanced? Yes
3. What makes some energy sources renewable and others nonrenewable? What they are made of
4. What are the advantages of using renewable energy sources? You can use them over and over again which conserves energy.
5. Do you think the U.S. has an obligation to reduce its use of nonrenewable energy sources? Why? Yes, because eventually we will run out of nonrenewable energy resources so we need to get used to the renewable ones.

- Historical data and equations for the transportation sector were revised to reflect revised data from NHTSA and FHWA.
- A new cement model was incorporated in the industrial sector.
- Photovoltaic capacity estimates for recent historical years (2009 and 2010) were updated to line up more closely with Solar Energy Industries Association (SEIA) and Interstate Renewable Energy Council (IREC) reports.
- Gulf of Mexico production data were revised downward to reflect data reported by the Bureau of Ocean Energy Management more closely.