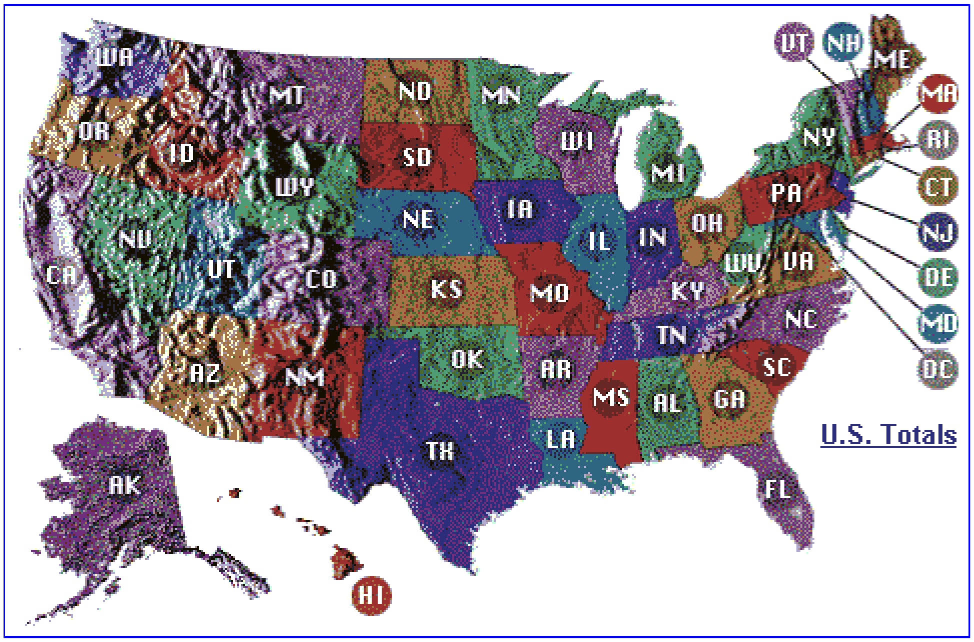
April 2004

United States of America

The United States of America is the world's largest energy producer, consumer, and net importer. It also ranks eleventh worldwide in reserves of oil, sixth in natural gas, and first in coal.

Information contained in this report is the best available as of April 2004 and is subject to change. For the latest monthly U.S. outlook by the Energy Information Administration, please see the "Short-Term Energy Outlook".



GENERAL BACKGROUND

As of mid-April 2004, the U.S. economy appeared to be recovering somewhat, with first quarter 2004 real growth in gross domestic product (GDP) of 5.0% (year-over-year). The U.S. Federal Reserve has maintained its interest rate target at an extremely low level (1.00%) in an effort to stimulate an economic recovery. At the same time, fiscal policy remains stimulatory, with the U.S. budget running large deficits (see below). The U.S. unemployment rate was estimated at 5.7% in March, up 0.1 percentage points from February, with the economy adding 308,000 jobs during the month but even more people entering the job market. Real (inflation adjusted) U.S. gross domestic product (GDP) growth for 2003 is estimated at 3.1%, up from 2.4% real growth in 2002. For 2004, real growth is expected at 4.7%.

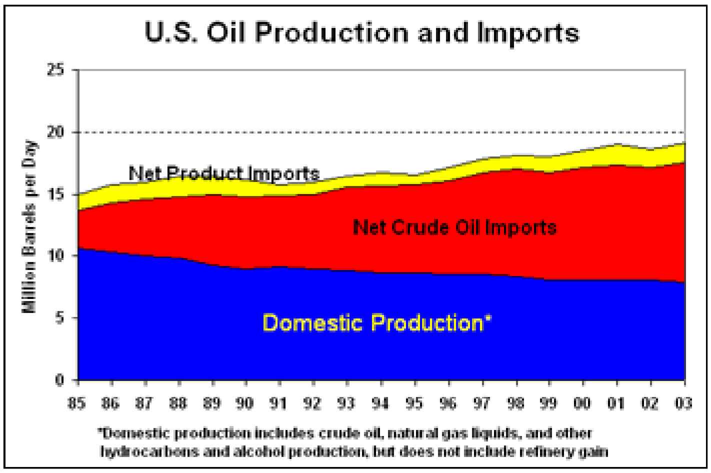
The U.S. merchandise trade deficit is estimated at $550 billion for 2003. The current account deficit now is running at about 5% of GDP, compared to 1.5% in 1997. During the past two years, the dollar has depreciated significantly against several major currencies, including the Euro and the

Japanese Yen.

In mid-May 2001, the Bush administration issued a series of energy policy recommendations as part of its new National Energy Policy Report, developed by a task force led by Vice President Dick Cheney. In April 2003, the U.S. House of Representatives voted on comprehensive energy legislation; a different Senate energy bill passed on July 31, 2003. As of mid-April 2004, the Congress had not yet passed the legislation.

OIL

According to the Oil and Gas Journal, the United States had 22.7 billion barrels of proved oil reserves as of January 1, 2004, eleventh highest in the world. These reserves are concentrated overwhelmingly (over 80%) in four states -- Texas (24% including the state's reserves in the Gulf of Mexico), Alaska (22%), Louisiana (20% including the state's reserves in the Gulf of Mexico), and California (19%, including the state's Federal Offshore reserves). U.S. proven oil reserves have declined by around 20% since 1990, with the largest single-year decline (1.6 billion barrels) occurring in 1991.



During 2003, the United States produced around 7.9 million barrels per day (MMBD) of oil, of which 5.7 MMBD was crude oil, and the rest natural gas liquids and other liquids. U.S. total oil production in 2003 was down sharply (around 2.7 MMBD, or 25%) from the 10.6 MMBD averaged in 1985. U.S. crude oil production, which declined following the oil price collapse of late 1985/early 1986, leveled off in the mid-1990s, and began falling again following the sharp decline in oil prices of late 1997/early 1998. With the rebound in world oil prices since March 1999, U.S. crude production fell slightly in 2002 and 2003, and is now at 50-year lows.

The United States contains over 500,000 producing oil wells, the vast majority of which are considered "marginal" or "stripper" wells, generally producing only a few barrels per day of oil. During 2003, top oil producing areas included the Gulf of Mexico (1.6 million bbl/d), Texas onshore (1.1 million bbl/d), Alaska's North Slope (949,000 bbl/d), California (683,000 bbl/d), Louisiana onshore (244,000 bbl/d), Oklahoma (178,000 bbl/d), and Wyoming (143,000 bbl/d).

According to Baker Hughes Inc., which has tallied weekly U.S. drilling activity since 1940, domestic oil and natural gas drilling has rebounded sharply since the low point of 488 reached in late April 1999 following the oil price collapse of late 1997. In mid-October 2001, for instance, the U.S. weekly "rig count" reached the 1,141 mark (933 for natural gas and 208 for oil), close to the highest number since late 1990. The U.S. "rig count" then fell, reaching 843 (703 gas rigs and 137 oil rigs) as of mid-October 2002, before rising once again, reaching 1,150 during the week ending March 26, 2004. Currently, natural gas rigs outnumber oil rigs in the United States by more than five-fold (982 to 165). Historically, U.S. drilling activity peaked in 1981, with a total of 91,553 wells (43,598 oil, 20,166 natural gas, 27,789 dry wells) drilled in that year. For 2003, a total of 30,151 wells (20,011 natural gas wells, 5,694 oil wells, and 4,446 dry wells) were drilled in the United States, up from the low point of 18,377 total wells drilled in 1999, and also up (18%) from 25,536 wells drilled in 2002.

Lower-48 States oil production is expected to decrease by 120,000 bbl/d, to 4.64 million barrels per day, in 2004, followed by an increase of 110,000 bbl/d in 2005. Generally speaking, Lower-48 onshore production -- particularly in Texas -- is falling, while offshore (mainly Gulf of Mexico) production is rising. In 2004, Gulf of Mexico oil production is expected to increase from new fields that came online in late 2003, combined with start-ups at the southern Green Canyon deepwater area in late 2004. By late 2005, the Mars, Mad Dog, Ursa, Thunder Horse and Nakika Federal Offshore fields are expected to account for about 12% of Lower-48 oil production. Meanwhile, Alaskan oil production is expected to decrease by 2.1% in 2004 and by 5.3% in 2005, continuing a steady decline since the state's peak output in 1988, at 2.017 million bbl/d. As of February 2004, Alaska was producing about 938,000 bbl/d of oil. Alaska is expected to account for 16% of the total U.S. crude oil production in 2005.

Most of Alaska's oil output comes from the giant Prudhoe Bay Field, and is transported via the Alyeska pipeline. A new oilfield, known as Alpine (owned 78% by Phillips Petroleum, 22% by Anadarko), began production in November 2000. Alpine represents one of the largest North American onshore oil discoveries in years, and currently is producing around 100,000 bbl/d of high quality, light crude oil. Production at Alpine is to be maintained using tie-ins to the Nanuq and Fiord satellite fields beginning in 2006. Phillips has been the largest oil producer in Alaska since acquiring Arco's Alaska fields in early 2000. The combined production rate from the Alpine and North Star fields averaged nearly 173,000 bbl/d during June 2003. Production from the Kuparuk River field plus the production from West Sak, Tobasco, Tarn and Meltwater fields is expected to stay at an average of 210,000 bbl/d in coming years.

In early 2000, the Energy Information Administration (EIA), in response to a Congressional request, issued a report on potential oil reserves and production from the Arctic National Wildlife Refuge (ANWR). The report, which cited a 1998 U.S. Geological Survey study of ANWR oil resources, projected that for the mean resource case (10.3 billion barrels technically recoverable), ANWR peak production rates could range from 1.0 to 1.35 MMBD, with initial ANWR production possibly beginning around 2010, and peak production 20-30 years after that.

Production from deepwater areas of the Gulf of Mexico has been increasing rapidly, with deepwater wells accounting for about two-thirds of total U.S. Gulf output. Large fields include ExxonMobil's $1.1 billion Hoover-Diana development (which started up in May 2000 and was producing 80,000 bbl/d by 2002), plus several by BP: the $2 billion Atlantis project (scheduled to come online in 2005); Thunder Horse (the largest single field every discovered in the Gulf of Mexico, previously named "Crazy Horse," scheduled to come online in 2005), Crosby (developed by Shell, came online in late 2001, peak output of 60,000 bbl/d), Holstein (BP; expected online in late 2004), King (BP), King's Peak (BP), Mad Dog (BHP Billiton), Marlin, and Nakika (Shell and BP; first production in December 2003) fields. For its part, BP has stated that it plans to accelerate its deepwater Gulf of Mexico production plans, possibly including construction of a $1 billion deep-sea pipeline, and to increase its production from around 200,000 bbl/d currently to 700,000 bbl/d in 2007. In 2002, BP announced that it would spend $15 billion to accomplish this goal, possibly surpassing Shell as the main producing company in the deepwater Gulf region.

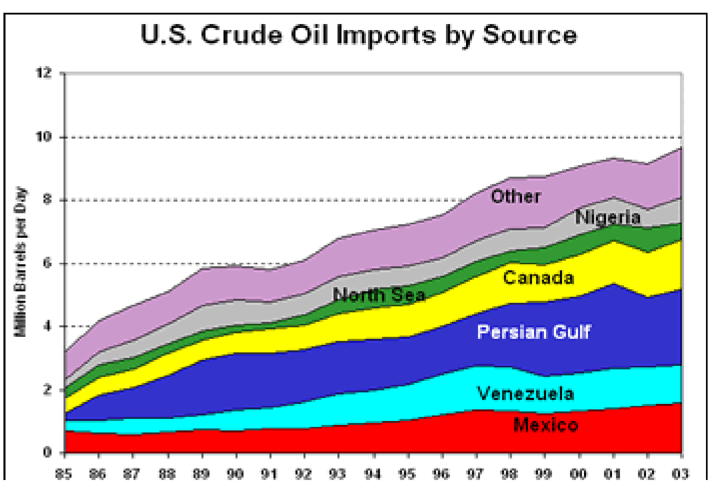
In June 2003, Unocal announced its intentions to build a $500 million deepwater crude oil port, the Bulk Oil Offshore Transfer System (BOOTS) in the Gulf of Mexico 100 miles south of Beaumont, TX. The BOOTS system would have a capacity of 1.2 million bbl/d, and would be linked to refineries in Houston/Texas City, Beaumont/Port Arthur, and Lake Charles.

Twenty-four major U.S. energy companies reported overall net income (excluding unusual items) of $10.1 billion on revenues of $183 billion during the fourth quarter of 2003 (4Q03). This level of net income represented a 43% increase relative to the fourth quarter of 2002 (4Q02) (see EIA's "Financial News for Major Energy Companies "). Domestic upstream oil and natural gas production operations accounted for $3.9 billion of net income, while foreign upstream oil and natural gas production operations ($3.6 billion) and domestic refining and marketing operations ($1.0 billion) trailed.

Independent oil and natural gas producers, oil field companies and refiner/marketers reported a sharp increase in net income (up 283%) during 4Q03 compared to 4Q02 (see EIA's Financial News for Independent Energy Companies). This increase in net income was due to improvements in all three major financial variables driving the performance of these companies: a large increase in the price of natural gas of 28%, an increase in the price of crude oil of 9%, and an increase in refinery margins of 7%.

Consumption/Marketing
The United States consumed an average of about 20.0 MMBD of oil in 2003, up from 19.8 MMBD in 2002. Of this, 8.9 MMBD (or 45% of the total) was motor gasoline, 4.8 MMBD (24%) "other oils" 3.9 MMBD (20%) distillate fuel oil, 1.6 MMBD (8%) jet fuel, and 0.77 million bbl/d (4%) residual fuel oil. Total 2004 petroleum demand is projected to grow by 420,000 barrels per day, or 2.1%, to an average 20.4 million barrels per day. All the major products (except residual fuel oil) are expected to contribute to this growth. Motor gasoline demand is projected to increase 2.6%, reflecting a continued acceleration of economic growth and a 6% decline in retail pump prices. Jet fuel demand, having declined for two consecutive years, is projected to post a growth rate of 2.3% to average 1.60 million barrels per day, still below the 2001 average. Distillate demand growth is projected to moderate to 1.9%, as demand reductions resulting from a forward projection of "normal" weather partly counteracts the projected 3.4% growth in distillate demand in the transportation sector. Residual fuel oil deliveries, having experienced growth in 2003, are projected to retrench by 11% in 2004. That reversal reflects the assumptions of normal weather and greater competition from natural gas, for which prices are projected to decline to levels that more effectively compete with those of other fossil fuels.

Imports/Exports
The United States averaged *total gross oil* (crude and products) imports of an estimated 12.2 MMBD during 2003, representing around 62% of total U.S. oil demand. Over two-fifths of this oil came from OPEC nations, with Persian Gulf sources accounting for about one-fifth of total U.S. oil imports. Overall, the top suppliers of oil (crude and refined products) to the United States during 2003 were Canada (2.1 MMBD), Saudi Arabia (1.8 MMBD), Mexico (1.6 MMBD), and Venezuela (1.4 MMBD).



U.S. Energy Sanctions Issues
The United States maintains energy sanctions against several countries. Iran and Libya are impacted by the Iran-Libya Sanctions Act (ILSA), passed unanimously by the U.S. Congress and signed into law by President Clinton in August 1996. ILSA imposes mandatory and discretionary sanctions on non-U.S. companies which invest more than $20 million annually (lowered in August 1997 from $40 million) in the Iranian oil and natural gas sectors. The passage of ILSA

was not the first U.S. sanction against Iran. In early 1995, President Clinton signed two Executive Orders which prohibited U.S. companies and their foreign subsidiaries from conducting business with Iran. The Orders also banned any "contract for the financing of the development of petroleum resources located in Iran." On March 13, 2001, President Bush, citing threats posed by Iran to U.S. national security, extended Clinton's two Executive Orders on Iran for another 6 months. On August 3, 2001, President Bush signed into law the ILSA Extension Act of 2001. This Act provides for a 5-year extension of ILSA with amendments that affect certain of the investment provisions.

Attempts by the United States to implement ILSA have run into opposition from a number of foreign governments. The European Union (EU) opposes the enforcement of ILSA sanctions on its members, and on November 22, 1996 passed resolution 2271 directing EU members to not comply with ILSA. On May 18, 1998, the EU and the U.S. reached an agreement on a package of measures to resolve the ILSA dispute at the EU/U.S. Summit in London, but the Summit deal is contingent upon acceptance by the U.S. Congress before full implementation may take place.

On April 5, 1999, following the Libyan handover of two suspects in the 1988 bombing of Pan Am flight 103 to stand trial before a Scottish Court in the Netherlands, the United States modified its Libya sanctions on April 28, 1999 to allow shipments of donated clothing, food and medicine for humanitarian reasons (trade in informational materials such as books and movies is also allowed). On February 1, 2001, one suspect was convicted by the Scottish court, while another was acquitted. The U.S. and British governments both said that they still expected Libya to accept responsibility for the murders, which Libya has said it would not do. On August 14, 2003, Libya reportedly agreed to compensate families of the 1988 Lockerbie airplane bombing with $2.7 billion total. The money was to be released in three tranches, the first following a lifting of United Nations sanctions, the second after possible lifting of U.S. sanctions, and the third after Libya is removed from the U.S. State Department's state sponsors of terrorism list. On September 12, 2003, the U.N. Security Council lifted sanctions against Libya, but U.S. sanctions remained in place. On February 26, 2004, the United States rescinded a ban on travel to Libya and authorized U.S. oil companies with pre-sanctions holdings in Libya to negotiate on their return to the country if and when the United States lifts economic sanctions.

Refining/Downstream

The United States experienced a steep decline in refining capacity between 1981 and the mid-1990s. Between 1981 and 1989, for instance, the number of U.S. refineries fell from 324 to 204, representing a loss of 3 MMBD in operable capacity, while refining capacity utilization increased from 69% to 86%. Much of the decline in U.S. refining capacity resulted from the 1981 deregulation (elimination of price controls and allocations), which effectively removed the major prop from underneath many marginally profitable, often smaller, refineries.

Refinery closures have occurred every year over the past two decades. Since 1988, the United States has lost over 1.6 MMBD of capacity, which is about 10% of today’s total refining capacity. Several factors are driving this situation: 1) refineries that have closed are smaller and have less favorable economics than other refineries in their market area; 2) even though refinery utilization has improved since the 1980’s, refinery margin improvements have been modest; and 3) in recent years, some smaller, less-economic refineries that faced additional investments for environmental reasons in order to stay in business found closing preferable because they predicted that they could not stay competitive in the long term.

While some refineries have closed, and no new refineries have been built in nearly 30 years, many existing refineries have expanded their capacities. As a result of "capacity creep," whereby existing refineries create additional refining capacity from the same physical structure, capacity per operating refinery increased by 28% over the 1990 to 1998 period, for example. Overall, since the mid-1990s, U.S. refinery capacity has increased from 15.0 MMBD in 1994 to 16.7 MMBD (as of January 1, 2004). In early April 2004, utilization of operating capacity at U.S. refineries was averaging around 88%-89%. Although financial, environmental, and legal considerations make it unlikely that new refineries will be built in the United States, expansion at existing refineries likely will increase total U.S. refining capacity in the long-run.

Strategic Petroleum Reserve (SPR)

The SPR was officially established on December 22, 1975, when then-President Ford signed the Energy Policy and Conservation Act (EPCA). EPCA declared it to be U.S. policy to establish a petroleum reserve of up to 1 billion barrels. In order to store the reserve oil, the U.S. government in April 1977 acquired several salt caverns along the Gulf of Mexico coastline. The first crude oil was delivered to the SPR on July 21, 1977, and stored at the West Hackberry storage site near Lake Charles, LA. Other major storage sites include: Bryan Mound and Big Hill in Texas and Bayou Choctaw in Louisiana, with a total storage capacity of 700 million barrels.

In mid-November 2001, President Bush directed the Department of Energy (DOE) to fill the SPR to its capacity of 700 million barrels in order to "maximize long-term protection against oil supply disruptions." Under the DOE plan, the SPR is to be filled with "royalty in kind" (RIK) oil. As of April 9, 2004, the SPR contained around 653 million barrels of oil -- the largest emergency oil stockpile in the world. The SPR has a maximum drawdown capability of 4.3 million bbl/d for 90 days, with oil beginning to arrive in the marketplace 15 days after a presidential decision to initiate a drawdown. The SPR drawdown rate declines to 3.2 million bbl/d from days 91-120, to 2.2 million bbl/d for days 121-150, and to 1.3 million bbl/d for days 151-180.

Under EPCA, there is no preset "trigger" for withdrawing oil from the SPR. Instead, the President determines that drawdown is required by "a severe energy supply interruption or by obligations of the United States" under the International Energy Agency. EPCA defines a "severe energy supply interruption" as one which: 1) "is, or is likely to be, of significant scope and duration, and of an emergency nature;" 2) "may cause major adverse impact on national safety or the national economy" (including an oil price spike); and 3) "results, or is likely to result, from an interruption in the supply of imported petroleum products, or from sabotage or an act of God." Should the President decide to order an emergency drawdown of the SPR, oil would be distributed mainly by competitive sale to the highest bidder(s). This would be accomplished in a 4-step process, including a "Notice of Sale," receipt of bids, selection of bidders, and finally delivery of oil.

Oil Mergers and Acquisitions

On April 7, 2004, Westport Resources Corporation agreed to be acquired by Kerr-McGee Corporation in a deal worth about $3.4 billion and that the *Wall Street Journal* said, "... will create the U.S.'s fifth-largest independent oil-and-natural-gas producer." The U.S.-based Kerr-McGee reportedly is offering 0.71 share for each share of Westport, which only has operations in the United States. The estimated $3.4 billion sale price reportedly includes about $900 million of Westport debt that Kerr-McGee absorbed in addition to approximately $2.5 billion of Kerr-McGee stock that will be exchanged for Westport stock.

On March 19, 2004 *The Wall Street Journal* reported that Marathon Oil will acquire from Ashland Corporation the 38-percent of the Marathon Ashland Petroleum refining/marketing joint venture that it does not already own. Marathon reportedly will pay about $3 billion (about $1.1 billion of cash and stock and assume about $1.9 billion of debt) for Ashland's share in the refining/marketing joint venture. In addition to the acquiring full ownership of the Marathon Ashland Petroleum assets, Marathon reportedly also intends to acquire 61 Valvoline Instant Oil Change outlets and other related assets currently owned by Ashland.

Two independent refiners, Frontier Oil and Holly, agreed to merge on March 31, 2003. The merger is valued at $462 million, including Frontier's assumption of $26 million of Holly's debt. If the deal is completed (currently, it is in litigation), the new company will retain the name of Frontier Oil. On February 24, 2003, Ocean Energy agreed to be acquired by Devon Energy in a transaction valued at $5.3 billion. The resulting company will be the largest independent oil and gas producer in the United States.

In September 2002, U.S. regulators approved the purchase of Pennzoil-Quaker State Co. by Shell Oil Co. The deal, first reported in March 2002, was for $1.8 billion (with Shell also assuming $1.1 billion of Pennzoil-Quaker State debt). The transaction combines Shell's 3% share of the U.S. market for passenger car motor oil with Pennzoil-Quaker State's 35% share, making Shell the No. 1 U.S. lubricants company. Shell also adds Pennzoil-Quaker State's 46,200 barrels-per-day Shreveport, Louisiana refinery and more than 2,000 Jiffy Lube outlets. In October 2002, Shell announced that it would close or sell seven U.S. blending and packaging plants as part of its ongoing merger.

In November 2001, Phillips Petroleum and Conoco Inc. agreed to merge in a $15.2 billion transaction. The merger was completed in August 2002, creating a new company called ConocoPhillips, which at the time ranked as the sixth-largest oil and gas company in the world, the largest U.S. refiner, and the third-largest U.S.-based energy company.

Another major oil industry merger/acquisition was announced in October 2000, this time between Chevron and Texaco. The deal received regulatory approval in early October 2001, and was approved by shareholders of the two companies on October 9, 2001, creating ChevronTexaco.

In November 2000, Russia's Lukoil announced that it intended to purchase Getty Petroleum Marketing for $71 million. Lukoil eventually intends to switch Getty's 1,300 retail outlets in the Northeastern and Middle Atlantic states to the Lukoil brand name. The purchase represents the first takeover of a publicly traded U.S. company by a Russian firm. In late January 2001, Getty shareholders approved the the buyout.

On April 13, 2000, the FTC approved the $27.6 billion BP Amoco-ARCO deal. This followed the March 15, 2000 announcement by Phillips Petroleum that it had agreed to purchase ARCO's assets in Alaska for $6.5 billion. The new company (now called BP) will rank in the top three private oil companies in the world, along with ExxonMobil and Royal Dutch/Shell.

Meanwhile, the $81 billion merger between Exxon and Mobil, which formed the world's largest privately owned petroleum company (in terms of revenues), was approved by the FTC on December 1, 1999, subject to the divestiture of 2,400 service stations and other assets (on December 3, 1999, 1,740 of these stations were sold to Tosco, the largest U.S. independent oil refiner). In a related development, in April 2000, Duke Energy said that it had agreed to acquire Mobil's European natural gas trading and marketing business. The sale of Mobil's natural gas operations in Europe was required by the European Commission as part of its approval of the ExxonMobil merger.

Besides these large mergers, several defensive mergers among smaller, independent oil companies also have been unveiled recently, including Kerr-McGee Corp.'s (KMG) $1.86 billion takeover of Oryx Energy Co. (ORX), and an agreement between Seagull Energy Corp. (SGO) and Ocean

Energy Inc. (OEI) to merge in a $1.1 billion deal (approved by shareholders in March 1999). On July 14, 2000, Anadarko Petroleum announced the closing of its merger transaction with the Union Pacific Resources Group. Union Pacific became a wholly owned subsidiary of Anadarko, creating one of the largest U.S. independent oil and natural gas companies. In January 2001, Amerada Hess announced that it was withdrawing a $3.5 billion offer to purchase Britain's Lasmo P.L.C., a move which would have created a "super-independent" oil company. Instead, Lasmo was purchased by Italy's ENI for $4 billion.

Due to low profitability in the refining/marketing line of business, U.S. integrated major energy companies began a process during the 1990s of selective refining/marketing divestiture, and numerous U.S. refineries were shut down. Among independent refiners, growth largely has been concentrated in the following group of companies -- Citgo/PDV America, Diamond Shamrock (merged with Ultramar during 1996, creating Ultramar Diamond Shamrock), Koch Industries, Premcor (formerly known as Clark Refining and Marketing), Tesoro Petroleum, and Valero Energy. In May 2001, Valero agreed to acquire Ultramar Diamond Shamrock for $6 billion. Another company, Tosco Corporation, was purchased by Phillips Petroleum for $7.5 billion in September 2001, creating the second largest refining group in the United States, behind ExxonMobil.

Over the past several months , several smaller companies announced or closed deals to purchase refining and/or related assets. For instance, Valero said in March 2003 that it would pay $289 million to buy El Paso's 102,500-bbl/d Corpus Christi refinery. This follows Valero's sale of its 168,000-bbl/d Golden Eagle refinery and related assets in northern California to Tesoro Petroleum for $1.1 billion in May 2002. On March 4, 2003, Premcor completed a $310 million purchase of Williams Company's 180,000-bbl/d refinery in Memphis, plus another $145 million for inventories. In other news, Canada's Suncor announced in April 2003 that it would buy ConocoPhillips' 58,000-bbbl/d Commerce City, Colorado refinery and related assets for $150 million. On December 30, 2003, Sunoco completed its purchase of El Paso's 150,000-bbl/d Eagle Point refinery and related assets in New Jersey for $130 million. Premcor announced in January 2004 that it would pay approximately $800 million to acquire Motiva’s 175,000-bbl/d Delaware City refinery. Williams Companies announced on April 1, 2004 that it had completed the sale of its 220,000-bbl/d North Pole refinery to a subsidiary of Koch Industries, making Koch the 9th-largest refiner in the United States.

NATURAL GAS

As of January 1, 2004, the United States had estimated proven natural gas reserves of 187 trillion cubic feet (Tcf), or 3.1% of world reserves (6th in the world). For 2003, U.S. production of dry natural gas is estimated at 19.1 Tcf. Natural gas consumption is estimated at 21.9 Tcf, with gross imports of 3.8 Tcf. Around 87% of U.S. natural gas imports come from Canada, mainly the western provinces of Alberta, British Columbia, and Saskatchewan. Overall, the United States depends on natural gas for about 23% of its total primary energy requirements (oil accounts for around 40% and coal for 23%).

Natural gas wellhead prices reached record highs of nearly $10.00 per thousand cubic feet (mcf) in late 2000/early 2001, but fell sharply soon thereafter to around $2.50 per mcf. Cold weather in the U.S. Northeast and Midwest during the winter of 2002/2003 raised prices once again, particularly in late February, as gas storage levels hit unusually low levels and cold weather limited pipeline operations. As of April 2, 2004, natural gas inventories in the Lower-48 states were about 5.7% (63 Bcf) below the 5-year average of 1,097 Bcf, but 50% higher than one year earlier. Working gas stocks hit their low point on March 14, 2003, at 50% below the 5-year average.

On June 10, 2003, Federal Reserve Chairman Alan Greenspan noted that rising natural gas prices in the United States could have a negative impact on the economy in the months ahead if prices remain at high levels. Greenspan stated, "I have no doubt that...if we stay at these very elevated prices we're going to see some erosion in a number of macroeconomic variables which are not evident at this stage. A very significant amount of natural gas using infrastructure in the American economy was based on $2 [per mcf] gas. That means a lot of noncompetitive structures are sitting out there." Greenspan emphasized the need for greater imports of liquefied natural gas (LNG) in order to boost domestic supplies and keep prices under control.

For all of 2003, the average natural gas wellhead price averaged $4.98 per mcf, up from $2.96 per mcf in 2002. An average natural gas wellhead price of about $5.03 per mcf is projected for 2004, assuming modest growth in domestic production.

Natural Gas Production and Storage

Dry natural gas production is expected to increase by about 1.2% in 2004, to 19.31 Tcf, from 19.08 Tcf in 2003. High natural gas prices resulted in strong natural gas-directed drilling activity during 2003, following the downturn in 2002. Natural gas production is expected to continue to rise slightly through 2005 as natural gas well completions, which totaled an estimated 20,000 in 2003, continue to grow to between 22,000 and 23,000 wells per year over the next 2 years.

Strong increases in U.S. natural gas production and net imports are needed over the next two decades to meet demand. Increased natural gas production is expected to come mainly from onshore sources, although offshore Gulf of Mexico production also is forecast to grow significantly. In August 2001, for instance, ExxonMobil began production at its $330 million Mica natural gas project in the deepwater Gulf of Mexico. Alaska's North Slope fields also represent a large potential natural gas source, with an estimated 30-35 Tcf of natural gas resources. Alaska's Governor Tony Knowles has stated that he supports a $17.2 billion natural gas pipeline running from the North Slope along the Alaska Highway into Alberta and on to markets in the U.S. Midwest (another option would be to route the pipeline via the MacKenzie Delta in northern Canada).

In the near term, increases in natural gas production likely will come mainly from lower 48 sources, with increased use of cost-saving technologies expected to result in continuing large natural gas finds, including in the deep waters of the Gulf of Mexico but also in conventional onshore fields. Currently, top natural-gas-producing states (in descending order) include Texas, Oklahoma, New Mexico, Louisiana, Wyoming, Colorado, Alaska, Kansas, California, and Alabama.

The Rocky Mountain area is projected to have the largest estimated surplus capacity in 2003 at 1.4 Bcf/d followed by Texas with 1.3 Bcf/d, New Mexico at 0.5 Bcf/d, and Oklahoma at 0.4 Bcf/d. Estimated surplus capacity in the rest of the Lower-48 States and Gulf of Mexico is roughly 2.0 Bcf/d. While the Lower-48 States taken together are likely to have a small surplus or unutilized capacity, specific areas may have little or none. Because of the limitations in the transportation network, surplus capacity in one area may not be available to all other areas.

In 2003, Gulf of Mexico production are expected to be limited by effective productive capacity. Lower drilling rates in the Gulf are the cause of the expected loss of surplus effective capacity. However, deep water prospects now being developed appear to produce at higher rates than completions in the recent past. Future completions in the study are modeled after recent past completions. Therefore, if the new wells are sufficiently more productive, some of the declining capacity could be alleviated. Adding to pipeline infrastructure could also increase effective productive capacity in the Gulf.

Natural Gas Demand

From 1990 through 2003, natural gas consumption in the United States increased by about 14%, although consumption fell 5% during 2003 in large part as a result of high gas prices. Still, growth in U.S. natural gas demand is likely in coming years along with economic growth, and also as gas prices level off. Greater use of natural gas as an industrial and electricity generating fuel can be attributed, in part, to its relatively clean-burning qualities in comparison with other fossil fuels. An expanding transmission and distribution network have also helped expand its acceptance and use. Natural gas is consumed in the United States mainly in the industrial (34%), electric power (24%), residential (21%), and commercial (14%) sectors.

U.S. natural gas consumption and imports, overwhelmingly from Canada -- and to a far lesser extent from Trinidad, Algeria, Qatar, and others in the form of LNG -- are expected to expand substantially in coming decades, with the fastest volumetric growth resulting from additional natural-gas-fired electric power plants. Increased U.S. natural gas consumption will require significant investments in new pipelines and other natural gas infrastructure.

Domestic and Import Pipelines

On November 1, 1993, FERC issued Order No. 636, which decoupled the various stages of the natural gas industry between wellhead and end-user. This order has led to significant restructuring of the interstate natural gas pipeline industry, including moves towards unbundled services, diversification into other energy sectors, and development of mega-pipeline systems.

During the past decade, interstate natural gas pipeline capacity has increased substantially. From January 1996 through August 1998 alone, at least 78 projects were completed adding approximately 11.7 billion cubic feet per day (Bcf/d) of capacity, and much more will be needed in coming years. Recently completed pipelines include the Pony Express project and the Trailblazer system expansion, providing access from the Wyoming and Montana production regions. Also, the Transwestern and El Paso natural gas pipeline expansions have increased capacity from New Mexico's San Juan Basin.

Despite a national economic slowdown and a 4.9% drop in overall U.S. natural gas consumption in 2001, more than 3,571 miles of pipeline and a record 12.8 Bcf/d of natural gas pipeline capacity were added to the national pipeline network during 2002. Five major new natural gas pipeline systems were completed and placed in operation during 2002. They were: Gulfstream Pipeline, 1,130 MMcf/d–560 miles, which carries natural gas under the Gulf of Mexico from gas-processing facilities located on the gulf coasts of the States of Mississippi and Alabama to west central Florida; North Baja Pipeline, 500 MMcf/d–80 miles (in U.S.), which exports gas to electric power plants located in Baja California, Mexico; Questar Southern Trails Pipeline, 87 MMcf/d–405 miles, which transports gas from the four corners area of New Mexico/Utah (San Juan Basin) to the California/Arizona border area; and the Guardian, 750 MMcf/d–142 miles, and Horizon, 380 MMcf/d—29 miles, pipelines, which expanded the flow of gas supplies between the Chicago (Illinois) hub and the growing market of northern Illinois and southern Wisconsin.

On December 1, 2000, the $2.9 billion, 1.3-Bcf/day Alliance Pipeline from western Canada (Fort St. John, British Columbia) to the Chicago area entered service. Another pipeline, the Independence Pipeline ($678 million) received FERC approval in July 2000, but was cancelled in June 2002 due to lack of customer interest.

Columbia Gas System’s Millennium project ($700 million), which is to connect Canadian natural gas sources to New York and Pennsylvania, received FERC go-ahead on September 19, 2002. When complete, Millennium will transport up to 700 MMcf/d of natural gas, providing an environmentally preferred option for generating electricity. According to the Millennium Pipeline consortium's Web site, more than 90% of the pipeline's 425-mile overland route uses existing utility corridors, with about 224 miles of the project replacing and upgrading a 50-year-old pipeline system owned and operated by Columbia Gas Transmission Corp. That existing system serves several major gas end-users, utilities and their customers in New York's Southern Tier region. Though the pipeline won FERC endorsement in 2002, the New York Department of Environmental Conservation found that Millennium's proposed crossing of the Hudson River at Haverstraw Bay was not consistent with the Coastal Zone Management Act (CZMA) and, accordingly, denied the pipeline a state permit. In response, in June 2003 the Millennium group filed an appeal with the U.S. Department of Commerce. This appeal, however, was rejected on December 15, 2003. The Millennium group still remains hopeful that it can find an amenable alternative route.

Growing U.S. demand for Canadian natural gas has been a dominant factor underlying many of the pipeline expansion projects this decade. The U.S. and Canadian natural gas grids are highly interconnected and Canadian natural gas has become an increasingly important component of the total natural gas supply for the United States. This is especially true for certain U.S. regions such as the Northeast, Midwest, the Pacific Northwest and California, which depend on Canadian natural gas for significant amounts of their supply. Overall, the United States received about 4.0 Tcf of natural gas (gross) from Canada during 2002, the same as in 2001. Mexico is a small net importer of natural gas from the United States.

There has been considerable progress in recent years on natural gas interconnections between Canada and the United States. The Northern Border Pipeline, an extension of the Nova Pipeline, came onstream in late 1999 and connects to Chicago through the upper Midwest. A further extension to Indiana entered service in 2001. The Maritimes and Northeast Pipeline came onstream in January 2000, running from Sable Island to New England, with further extensions into the Boston area to be completed during 2003. The pipeline has a capacity of 400 MMcf/d.

The $2.5 billion Alliance Pipeline, at 1,875 miles, is the longest pipeline ever built in North America, and is designed to carry about 1.3 Bcf/d of gas from western Canada (Fort St. John, British Columbia) to the Chicago area. The pipeline began commercial service on December 1, 2000. The U.S. utility Pacific Gas & Electric imports natural gas from British Columbia via the Alliance pipeline. To date, the Alliance system has been operating at close to its capacity of 1,630 MMcf/d.

Another possibility for future U.S. natural gas supplies lies in northern Canada, which contains around one third of that country's recoverable gas reserves. The Mackenzie Valley pipeline, for instance, could carry as much as 1.9 Bcf/d of gas from Canada's far north to southern Canada and the United States, possibly beginning in 2008. However, Canada is consuming increasing volumes of gas itself for such activities as oil sands extraction and processing. So, the assumption that imported natural gas from Canada might be the answer to U.S. gas needs in coming years may not prove to be correct. A competing pipeline would transport natural gas from Alaska's North Slope to the lower-48 states, with possible capacity as high as 4-5 Bcf/d, and potentially beginning sometime around 2012.

On October 12, 2001, the U.S. Coast Guard lifted a ban on LNG tankers from Boston harbor. The ban, in effect starting September 26, 2001 (two weeks after the terrorist attacks in New York and Washington, DC), was established in response to security and safety concerns about the ships that bring LNG to the import facility of Distrigas of Massachusetts (a Division of Tractebel, Inc.). The decision enabled the reopening of the Distrigas facility in Everett, Massachusetts, which received 45 shipments containing 99 Bcf of natural gas in 2000, mostly from Trinidad, accounting for 44% of total LNG imports into the United States that year. The Distrigas facility is one of four currently active LNG facilities in the United States (plus one in Puerto Rico). The other three active U.S. LNG facilities are located in Lake Charles, Louisiana; Elba Island, Georgia; and Cove Point, Maryland, which received its first commercial LNG cargo in 23 years in August 2003. Cove Point is now the nation's largest LNG import facility, and a new 2.5-Bcf storage tank is scheduled to be added in January 2005 by its owner, Dominion. Expansion is also planned for the Lake Charles and Elba Island LNG facilities.

All in all, there is growing interest in LNG to supply natural gas for U.S. electric power generation and provide supply flexibility. EIA expects that LNG imports to the United States will increase sharply beginning in 2007, growing to 2.2 Tcf in 2010 and 4.8 Tcf in 2025. During 2003, the United States received about 507 Bcf of LNG, mainly from Trinidad and Tobago, Algeria, and Qatar.

Currently, there are around two dozen LNG terminals on the drawing board to serve North America (mainly the United States), including the Sempra Energy Cameron LNG project in Hackenberry, LA, approved in September 2003 by the Federal Energy Regulatory Commission (FERC). Sempra's LNG terminal marks the first new LNG plant granted approval in the United States in 25 years. Besides the Hackenberry facility, Sempra signed a deal with BP in December 2003 to supply Indonesian LNG to a proposed receiving terminal in Baja California. The gas would then be piped to U.S. West Coast markets. Also in December 2003, Shell announced plans to build a $700 million LNG receiving terminal, called Gulf Landing, 38 miles off the coast of Louisiana. The project is slated to handle 1 Bcf/d of LNG starting in 2008 or 2009. Also, ChevronTexaco is planning an offshore LNG receiving terminal called Port Pelican, 40 miles off the Louisiana coast, and ExxonMobil may build a $600 million facility near Port Arthur, Texas.

In December 2003, EIA issued a report, "The Global Liquefied Natural Gas Market: Status and Outlook, in conjunction with a Department of Energy LNG summit. At the summit, Energy Secretary Spencer Abraham pledged to make the process of licensing and building LNG receiving terminals easier than it is now. In March 2004, an agreement between FERC, the Coast Guard, and the Department of Transportation aims at streamlining the process regarding environmental, safety, and security reviews of proposed LNG projects.

Natural Gas Mergers, Acquisitions, Bankruptcies

As with oil, a number of major natural gas market participants are engaging in various forms of corporate combinations, such as mergers, acquisitions, and strategic alliances. In August 2001, Devon Energy announced the planned acquisition of Mitchell Energy for $3.1 billion, forming the second largest independent natural gas producing company in the United States, behind Anadarko Petroleum Corp. (in February 2003, Devon reached an agreement to acquire Ocean Energy, creating the largest independent oil and gas producer in the United States -- see above). In late January 2001, El Paso Energy completed its $24 billion merger with Coastal, creating the fourth-largest U.S. energy company by market capitalization (after BP, ChevronTexaco, and Enron at the time). The October 1999 merger between El Paso Energy Corporation and Sonat had created the largest transporter of natural gas in the country.

On December 2, 2001, Enron, formerly the world's largest electricity and natural gas trading company, filed for Chapter 11 bankruptcy in the Southern District of New York for 14 affiliated entities, including Enron, Enron North America, Enron Energy Services, Enron Transportation Services, Enron Broadband Services, and Enron Metals & Commodity Corporation. Enron had been the seventh-largest publicly-traded energy company in the world. On January 2, 2002, the U.S. Department of Justice confirmed that a criminal probe of Enron had been launched. In July 2003, a U.S. District Court Judge, Melinda Harmon, set October 17, 2005, as the trial date for classaction lawsuits filed against former Enron executives, plus the banks and law firms the company worked with.

COAL

The United States produced 1,069 million short tons (Mmst) of coal in 2003, down 2.3% from 1,094 Mmst in 2002. Also in 2003, the United States consumed 1,090 Mmst (up 2.3% from 1,066 Mmst in 2002). Led by Wyoming (376 Mmst of production in 2003), the West is the leading U.S. coal-producing region, with about half of the U.S. total, overwhelmingly from surface mines. Appalachia (led by West Virginia and Kentucky) accounts for about 35% of total U.S. coal production, mainly from underground mines. Around three-fifths of U.S. coal production is bituminous, one-third subbituminous, and about one-tenth lignite (brown coal). Around 80,000 miners work in the $20 billion U.S. coal industry, down from a peak of 700,000 in 1923, when U.S. coal production was half what it is today. Major U.S. coal companies include Peabody Energy (the largest in terms of production), Arch Coal (the second largest coal producer); and Kennecott Energy.

The electric power sector (made up of electricity producers whose primary business is producing power for public distribution) accounts for the vast majority over 90%) of U.S. coal consumption, with coke plants and "other industrial" taking nearly all the rest. In coming years, as sulfur dioxide emissions standards are tightened (in 2000, for instance, Phase 2 of CAAA took effect), the share of low-sulfur coal (mainly from the western U.S.) in the country's coal consumption mix is expected to increase. In 2002, production of medium- and high-sulfur coal was 578 Mmst (52%), while low-sulfur coal output was 527 Mmst (48%). By 2025, medium- and high-sulfur coal is expected to make up just 43% of total U.S. coal output, with low-sulfur coal accounting for 57% of the total.

U.S. gross coal exports fell sharply starting in the mid-1990s due mainly to lower world coal prices and increased competition from other coal-producing nations (i.e., Australia, South Africa, China, Venezuela, Colombia), plus natural gas -- especially in Europe. In 2002, the United States exported 40 Mmst of coal, down from 108 Mmst of exports in 1991. In 2003, U.S. coal exports increased slightly, to 43 Mmst, of which nearly half went to Canada. In coming years, the U.S. coal industry is expected to continue to face strong competition from other coal-exporting countries, with limited or negative growth in import demand in Europe and the Americas. U.S. gross coal imports are estimated at 25.0 Mmst in 2003, up 48% from 16.9 Mmst in 2002. The continued rise in U.S. gross coal imports is partly attributable to heightened demand for low-sulfur coal, and in part to the need to meet stricter sulfur emission requirements of Phase II of the CAAA.

During 2004, coal production is expected to rise slightly in Appalachia, fall slightly in the U.S. Interior, and increase strongly in the West. In 1998, low-sulfur western coal production surpassed relatively higher-cost, higher-sulfur, Appalachian coal for the first time, following strong increases since 1994, prompted largely by Phase 1 of the Clean Air Act Amendments of 1990 (CAAA). CAAA originally took effect during 1995, and required lower sulfur emissions from coal combustion. In response, Wyoming increased its coal production sharply, particularly low-sulfur, low-ash (and low cost) coal from the Powder River Basin, where coal is strip-mined.

There were several issues that had an impact on coal production in 2003. Some of them were minor and had temporary effects (weather and transportation), while some were major and could affect the coal industry well into the future (legal and financial). Among the minor issues were weather (rain or the lack thereof), transportation bottlenecks, and a one-day disruption in the electric power grid. The weather played a part in some of the transportation bottlenecks. The lack of rain lead to low water levels in the river transportation system, in particular on the Mississippi River in January and again in August, which resulted in delayed coal barge shipments. There were severe rains in the

Powder River Basin in June that impacted both coal production (causing some mine pit flooding and collapsing highwalls) and transportation (delays in train deliveries). Rail congestion problems continued to occur periodically in some States in the Western Region during the year. In August of 2003, there was an electricity blackout that affected over 50 million customers in the northeast U.S. and portions of Canada.

On January 29, 2003, the Fourth Circuit Court of Appeals ruled in favor of the coal industry and the Department of Justice by overturning Judge Charles Haden's May 2002 ban on new valley fill permits at coal mines in West Virginia and eastern Kentucky. The three-judge panel ruled that the 2002 ruling had been "over broad" and essentially supported the existing policies that the Army Corps of Engineers has followed for many years in issuing fill permits under the Clean Water Act.

Besides the valley fill issue, there were other legal challenges to the coal industry in 2003. A new lawsuit was filed over the level of environmental review needed in the permitting system as well as new challenges to the New Source Review program requirements for power plants. A coalition of environmental groups filed a lawsuit stating that all applications for permits should get full environmental review, while a coalition of several States and local governments sued the Environmental Protection Agency (EPA) to block the implementation of the new rule published at the end of October.

Bankruptcies continued to exert their influence on the coal industry as several producers and a few consumers were still trying to emerge from Chapter 11 during the year and another mid-sized coal company filed for bankruptcy protection in 2003 as it tried to realign its finances. The year also saw the continuing effort of several companies trying to exit the coal business by selling their mining interests to other parties. Adverse geological conditions and equipment problems continue to trouble some mining operations in both the Appalachian and Western Regions, while underground fires in Appalachia caused some mining operations to temporarily suspend production during 2003.

ELECTRICITY

In 2003, the United States generated 3,848 billion kilowatthours (Kwh) of electricity, including 3,691 billion Kwh from the electric power sector plus an additional 157 billion Kwh coming from combined heat and power (CHP) facilities in the commercial and industrial sectors. For the electric power sector, coal-fired plants accounted for 53% of generation, nuclear 21%, natural gas 15%, hydroelectricity 7%, oil 3%, geothermal and "other" 1%.

Natural gas-fired power generation has greatly increased its share of the U.S. power mix over the past few years, from just 9% in 1988 to 18% in 2002, although it fell back in 2003, to 16%, due in large part to higher gas prices during 2003. Coal-fired power generation generally has been less attractive than natural gas in recent years due to relatively high capital costs and longer construction periods. As a result, coal's share in the U.S. power mix has fallen from 57% in 1988 to 51% in 2003. The share of nuclear power generation in the U.S. power mix has remained relatively flat over the past 15 years or so, increasing slightly from 19% in 1988 to 20% in 2003. Oil's share has fallen from 5% in 1988 to 3% in 2003.

On a national level, the average retail price of electricity during the first eleven months of 2003 averaged 7.43 cents per Kwh, up 3% from 7.21 cents per Kwh in 2002 and up 1.5% from 7.32 cents per Kwh in 2001. Electricity prices in the United States fell every year between 1993 and 1999, but this trend reversed in 2000, 2001, and 2003.

As of 2002, U.S. net summer electric generating capacity was 905 gigawatts (GW). Of this total, 76% was thermal (35% coal, 19% natural gas, 18% "dual-fired," 4% petroleum), 11% hydro, 11% nuclear, and 2% "other renewables" (geothermal, solar, wind). The amount and geographical distribution of capacity by energy source is a function of, among other things, availability and price of fuels and/or regulations. Capacity by energy source generally shows a geographical pattern such as: significant nuclear capacity in New England, coal in the central U.S., hydroelectric in the Pacific West, and natural-gas-fired capacity in the Coastal South.

Total U.S. annual electricity demand grew only slightly -- about 0.8% -- during 2003. For 2004, electricity demand is expected to increase about 2% from 2003 levels, driven by accelerated growth in the economy and weather-related increases in the first and the fourth quarters.

In March 2001, the Energy Secretaries of Canada, Mexico, and the United States met to discuss a common energy strategy for the three countries, including integration of the three countries' power grids and creation of a US-Mexican working group to focus on promoting cross-border electricity trade. At present, power trade between Mexico and the United States is severely limited by infrastructure constraints, including inadequate power transmission capability (there are only two cross-border transmission lines: San Diego-Tijuana and El Paso-Matamoros). In January 2001, a small (50-MW), natural-gas-fired power plant in Baja California began exporting power to California. Canada exported about 36 bkwh of electricity to the United States in 2002, mostly from Quebec, Ontario, and New Brunswick to New England and New York. Smaller volumes are exported from British Columbia and Manitoba to Washington state, Minnesota, California, and Oregon. There is considerable reciprocity between the Canadian and U.S. power markets, as the United States also exports smaller volumes of electricity to Canada.

On August 14, 2003, a huge electric power blackout hits large parts of the northeastern United States, the Midwest, and southern Canada late in the afternoon. Power was knocked out for at least several hours in major cities like New York, Detroit, Cleveland, and Toronto. President Bush called the blackout a "wake-up call" and promised, "we will figure out what went wrong and we will address it." On August 19, U.S. Energy Secretary Spencer Abraham said that his agency would head up a sweeping investigation into what caused the blackout, adding, "The electric transmission grid is quite possibly the most vital piece of infrastructure we have." On September 3, the House of Representative’s Energy and Commerce Committee launched an investigation into what caused the power to go out.

Nuclear

In 2003, U.S. nuclear power generation was 766 billion kWh, or about 20% of total U.S. electricity generation, second only to coal in the U.S. electricity generation mix. Nearly 40% of U.S. nuclear output was generated in just five states: Illinois, Pennsylvania, South Carolina, North Carolina, and New York. The average capacity factor for all nuclear units nationwide increased from 88.1% in 2000 to over 90% in 2002, an all-time record high utilization rate. For 2003, the nuclear capacity utilization rate fell slightly, to 89%. Following the September 11, 2001 terrorist attacks on the United States, security at nuclear power plants around the United States was increased dramatically.

Annual nuclear generation in the United States dropped from 780 billion kWh in 2002 to 766 billion kWh in 2003. Possible explanations for the decline are still under study, but part of the decline could have come from the fact that several nuclear plants were shut down for 3-8 days during the Northeast power outage in August 2003.

Nuclear power in the United States grew rapidly after 1973, when only 83 billion kWh of nuclear power was produced. As of 2003, nuclear power output had grown nine-fold, with 104 licensed nuclear power units generating 780 billion kWh of electricity. This rapid growth in nuclear power generation, however, obscures serious underlying problems in the U.S. nuclear industry. After 1974, many planned units were canceled, and since 1977, there have been no orders for any new nuclear units, and none are currently planned. The 1979 Three Mile Island accident greatly increased concerns about the safety of nuclear power plants in the United States. The regulatory reaction to those concerns contributed to the decline in the number of planned nuclear units, with Watts Bar I (1996) the last plant completed. In late March 2000, the Nuclear Regulatory Commission (NRC), in a positive signal to the U.S. nuclear power industry, granted the first-ever renewal of a nuclear power plant's operating license. The 20-year extension (until 2034 and 2036 for two reactors) went to the 1,700-MW Calvert Cliffs plant in Maryland.

On July 9, 2002, the U.S. Congress voted to formally approve Yucca Mountain, located 100 miles north of Las Vegas, as the nation's permanent nuclear waste depository (on December 2, 2003, President Bush signed a $27.3 billion energy and water bill that included funding for the Yucca Mountain facility). Studies on Yucca Mountain as a possible nuclear power plant waste site have been going on for over two decades, with concerns centering on the dangers of transporting nuclear materials to the site via rail or highway. Nuclear utilities have complained that they are running out of nuclear waste storage capacity at their nuclear plants, with many being forced to resort to "dry cask" storage of spent fuel assemblies after water-storage pools reached capacity. The repository also remains a source of controversy between state and federal officials. In February 2002, Nevada Governor Kenny Guinn indicated that he would oppose the project, making congressional approval necessary for Yucca Mountain to go forward. The site's selection is also being challenged in Federal Appeals court by the state of Nevada. Overall, the project is expected to cost $40 to $50 billion and be able to store 77,000 tons of radioactive waste.

Hydroelectricity/Other "Renewables"

The United States consumed 6.1 quadrillion Btu of renewable energy in 2003, about 6% of total domestic gross energy demand, with the largest component used for electricity production. As of February 2003, eleven states had adopted renewables portfolio standards (RPS) aimed at increasing the share of renewable power in the energy mix. Several other states are considering adoption of an RPS, while others with RPS already in place are looking to accelerate renewables development even faster. Growth in renewable energy continues to be challenged by little or no development of new hydroelectric sites, a slow but lengthy decline in the use of biomass for non-electric purposes, and the high capital costs of most renewable energy production facilities, compared with fossil-fueled alternatives.

Overall, hydropower made up around 45% of total U.S. renewable consumption in 2003, with biofuels (including wood and waste), solar, wind, and geothermal making up most of the remainder. Total hydropower generation rose by around 4% during 2003 compared to 2002, and 27% compared to 2001, a bad drought year. In 2003, about 61% of U.S. hydroelectric output was supplied by just four states: Washington, California, and Oregon on the Pacific coast, plus New York. For 2004, total hydropower generation is expected to rise by 10% compared to 2003.

Wind, solar, biomass, and geothermal power, although growing, still supply only a tiny fraction of U.S. energy needs. In January 2000, however, the U.S. Department of Energy's National Renewable Energy Laboratory (NREL) released a report which said that the domestic photovoltaic (PV) industry could provide up to 15% of "new U.S. peak electricity capacity expected to be required in 2020." In 2002, shipments of solar PV cells and modules expanded by 15%, to around 112 megawatts, according to EIA's Renewable Energy Annual 2002. The average unit price of PV cells decreased in 2002 by 14%, to $2.12 per peak megawatt. Solar thermal collector manufacturing rose modestly in 2002, consistent with the general pattern seen since 1992 (except for a sharp rise between 2000 and 2001). Total shipments of solar thermal collectors rose 4%, to 11.7 million square feet.

In 2003, 1,687 MW of wind power capacity was added in the United States, pushing the total to 6,374 MW, a 36% increase from 2002. This growth, while rapid, was slightly slower than the record growth of 1,694 MW seen in 2001, according to the American Wind Energy Association (AWEA). Fluctuations in wind power capacity additions stem in part from the uncertain status of a key federal wind Production Tax Credit, or PTC, first established in 1992. The PTC expired on December 31, 2003, with its renewal status tied up with the overall energy bill, now stalled in Congress. The PTC, among other factors, has helped boost total U.S. installed wind generating capacity from 1,584 MW in 1992, with wind turbines now located in 26 states. The AWEA estimates that by 2020, wind power could supply at least 6% of U.S. electric power needs. California, Texas, Minnesota, and Iowa currently are the top four states in terms of installed wind power capacity, while the largest wind farm is located on the Oregon-Washington state line.

The first U.S. offshore windmill park, with a total capacity of 420 MW, has been proposed for construction off the Cape Cod coast. The project could power more than 200,000 homes in Cape Cod. Also, Iowa's largest utility (MidAmerican Energy) has announced plans for a 310-MW wind power facility, the country's largest to date. Both Cape Cod and Iowa are areas of the country considered to have large wind energy potentials. Iowa's governor, Tom Vilsack, has set a target for Iowa of reaching at least 1,000 MW in renewable power capacity by 2010.

ENVIRONMENT

The United States, with the world's largest economy, is also the world's largest single source of anthropogenic (human-caused) greenhouse gas emissions. Quantitatively, the most important anthropogenic greenhouse gas emission is carbon dioxide, which is released into the atmosphere when fossil fuels (i.e., oil, coal, natural gas) are burned. Current projections indicate that U.S. emissions of carbon dioxide will reach 5,985 million metric tons in 2005, an increase of 1,083 million metric tons from the 4,902 million metric tons emitted in 1990, and around one-fourth of total world energy-related carbon emissions. At the December 1997 global warming summit in Kyoto, Japan, the U.S. delegation agreed to reduce U.S. carbon emissions 7% from 1990 levels by 2008-2012. Given current EIA projections, it is unlikely that this goal will be met.

In February 2002, the Bush Administration released its proposed alternative to the Kyoto Treaty, calling for significant reductions in emissions of various pollutants (mercury, nitrogen oxide, sulfur dioxide). The program, known as the "Clear Skies Initiative," would utilize a "cap and trade" system which would allow companies to trade emissions credits. In addition, the Bush Administration envisions reductions in U.S. "greenhouse gas intensity" -- the amount of greenhouse gases emitted per dollar of GDP -- by 18% over 10 years. As the graph here shows, U.S. carbon emissions per dollar of GDP have been declining steadily since at least 1980.

U.S. energy-related carbon emissions have leveled off in recent years for one main reason: the U.S. economy, which had experienced strong economic growth during the 1990s, has slowed considerably, caused energy consumption to stagnate. In contrast, carbon emissions rose sharply during the 1990s along with the economy, and also as energy "efficiency gains" of the 1980s, which were prompted largely by the oil price spikes of the 1970s, began to level off, particularly since the 1985/86 oil price collapse. Sales of sport-utility vehicles, minivans, and small trucks, for instance, all of which are less fuel efficient than small cars, have increased sharply in recent years. Meanwhile, nuclear power generation (which emits no carbon), has now stagnated and is expected to decline after expanding rapidly during the 1970s and 1980s. Hydroelectricity, the other major non-fossil energy source in the United States, also has not been growing. The implication of all this is that carbon emissions will begin to grow again as the U.S. economy picks up.

On March 27, 2001, the Bush administration declared that the United States had "no interest" in implementing or ratifying the Kyoto treaty limiting greenhouse gas emissions, but that it would pursue other ways of addressing the climate change issue. On April 12, 2001, the White House affirmed Clinton administration-approved energy efficiency standards for washing machines and water heaters. Under these standards, clothes washers would become 22% more efficient by 2004 and 35% more by 2007. In January 2002, Energy Secretary Spencer Abraham announced an initiative, known as "Freedom CAR," to help automakers produce fuel-cell-powered electric vehicles. And in January 2002, President Bush proposed a new hydrogen fuel cell vehicle initiative. On April 2, 2004, the Energy Department agreed to require new central air conditioners and heat pumps to be 30% more efficient beginning in 2006. The Energy Department had attempted to set the standard, lower, at 20%, but a January 2004 court ruling prevented the Department from doing so.

COUNTRY OVERVIEW
President: George W. Bush (since January 20, 2001)
Legislative Branch: Bicameral Congress (Senate, House of Representatives)
Judicial Branch: Supreme Court
Independence: July 4, 1776
Population (July 2003E): 290.3 million
Location/Size: North America, between Canada and Mexico/9,629,091 sq. km (3,717,792 sq. miles)., the third largest country in the world, behind Russia and Canada
Major Cities: Washington, DC (capital), New York, Los Angeles, Chicago, Houston, Miami, Philadelphia, etc.
Languages: English, Spanish (spoken by a sizable minority)
Ethnic Groups (2000): White (77.1%), Black (12.9%), Asian (4.2%), Native American (1.5%), other (4%). Note: Hispanics, who can be of any race, made up 11.8% of the U.S. population as of 8/1/2000.
Religions (1997): Protestant (58%), Roman Catholic (26%), Jewish (2%), other (6%), none (8%)

ECONOMIC OVERVIEW
Currency: Dollar ($)
Exchange Rates, per Dollar (4/21/2004): British Pound (0.55957); Canadian Dollar (1.3571); Euro (0.84303);Japanese Yen (108.68)
Gross Domestic Product (GDP) (2003E): $11.0 trillion
Real GDP Growth Rate: (2002E): 2.2% **(2003E):** 3.1% **(2004F):** 4.7%
Inflation Rate (consumer price index) (2002E): 1.6% **(2003E):** 2.3% **(2004F):** 1.4%
Unemployment Rate (2001E): 4.8% **(2002E):** 5.8% **(2003E):** 6.0% **(3/04E):** 5.7%
Current Account Balance (2001E): -$394 billion **(2002E):** -$481 billion **(2003E):** -$550 billion
Merchandise Exports (2002E): $682 billion **(2003E):** $714 billion **(2004F):** $814 billion
Merchandise Imports (2002E): $1,165 billion **(2003E):** $1,263 billion **(2004F):** $1,395 billion
Merchandise Trade Balance (2002E): -$483 billion **(2003E):** -$550 billion **(2004F):** -$581 billion
Major Exports: Capital goods, automobiles, industrial supplies and raw materials, consumer goods, agricultural products
Major Imports: Crude oil and refined petroleum products, machinery, automobiles, consumer goods, industrial raw materials, food and beverages
Major Trading Partners: Canada, Japan, European Union, Mexico
Unified Federal Budget Balance (2002E): -$158 billion **(2003E):** -$375 billion **(2004F):** -$477 billion

ENERGY OVERVIEW
Secretary of Energy: Spencer Abraham (since January 20, 2001)

Proven Oil Reserves (1/1/04E): 22.7 billion barrels
Oil Production (2003E): 7.9 million barrels per day (bbl/d), of which 5.7 million bbl/d is crude oil (NOTE: Including "refinery gain," US oil production in 2003 is estimated at 8.8 million bbl/d)
Oil Consumption (2003E): 20.0 million bbl/d
Net Oil Imports (2003E): 11.2 million bbl/d (56.0% of total consumption)
Gross Oil Imports (2003E): 12.2 million bbl/d (of which, 9.6 million bbl/d was crude oil and 2.6 million bbl/d were petroleum products)
Crude Oil Imports from the Persian Gulf (2003E): 2.4 million bbl/d (around 25% of gross U.S. crude oil imports)
Top Sources of U.S. Crude Oil Imports (2003E): Saudi Arabia (1.72 million bbl/d); Mexico (1.59 million bbl/d); Canada (1.55 million bbl/d); Venezuela (1.19 million bbl/d)
Value of Gross Oil Imports (2003E): $132.5 billion (up from $102.7 billion in 2002)
Crude Oil Refining Capacity (1/1/04E): 16.7 million bbl/d (132 refineries)
Total Oil Stocks (4/2/04E): 1.57 billion barrels (including about 651 million barrels in the U.S. Strategic Petroleum Reserve)
Oil Wells Drilled (2003E): 5,694 (down from 8,060 during 2001)
Operating Oil and Natural Gas Rotary Rigs in Operation (2/04E): 1,032 (872 for natural gas and 157 for oil)
Natural Gas Reserves (1/1/03E): 183 trillion cubic feet (Tcf)
Dry Natural Gas Production (2002E): 19.0 Tcf **(2003E)**: 19.1 Tcf **(2004F)**: 19.3 Tcf
Natural Gas Consumption (2002E): 23.0 Tcf **(2003E)**: 21.9 Tcf **(2004F)**: 22.3 Tcf
Gross Natural Gas Imports (2002E): 4.0 Tcf (94% from Canada) **(2003E):** 3.8 Tcf (87% from Canada)
Natural Gas Wells Drilled (2003E): 20,011 (up from 15,947 in 2002 but down from 22,083 in 2001)
Recoverable Coal Reserves (12/31/98): 275.1 billion short tons (54% lignite and subbituminous; 46% anthracite and bituminous)
Coal Production (2002E): 1,094 million short tons (Mmst) **(2003E):** 1,070 Mmst **(2004F)**: 1,099 Mmst
Coal Consumption (2002E): 1,066 Mmst **(2003E):** 1,094 Mmst **(2004F)**: 1,105 Mmst
Gross Coal Exports (2002E): 40 Mmst **(2003E):** 43 Mmst **(2004F)**: 44 Mmst
Gross Coal Imports (2002E): 17 Mmst **(2003E):** 25 Mmst **(2004F)**: 25 Mmst
Primary and Secondary Coal Stocks (closing; 12/03E): 164 Mmst (compared to 192 Mmst in 12/02)
Electric Net Summer Installed Capacity (2002E): 905 gigawatts (76% thermal-fired, 11% nuclear; 11% hydroelectric, and 2% "renewables")
Net Electricity Generation (2002E): 3,858 bkwh **(2003E)**: 3,848 bkwh **(2004F)**: 3,919 bkwh

ENVIRONMENTAL OVERVIEW
Administrator of the U.S. Environmental Protection Agency: Michael Leavitt (since November 6, 2003; succeeded Christie Todd Whitman)
Total Energy Consumption (2002E): 98.3 quadrillion Btu **(2003E):** 98.1 quadrillion Btu (25% of world total energy consumption)
Energy-Related Carbon Dioxide Emissions (2002E): 5,796 million metric tons of carbon (about 24% of world total carbon emissions)
Per Capita Energy Consumption (2003E): 338 million Btu
Per Capita Carbon Dioxide Emissions (2002E): 20.3 metric tons
Energy Intensity (2003E; nominal): 8,918 Btu
Carbon Dioxide Intensity (2002E; nominal): 0.55 metric tons of carbon dioxide/thousand dollars
Sectoral Share of Energy Consumption (2003E): Industrial (33%), Transportation (27%), Residential (22%), Commercial (18%)

Fuel Share of Energy Consumption (2003E): Oil (40%), Coal (23%), Natural Gas (23%), Nuclear (8%), Hydroelectricity (3%), Other "renewables" (3%)
Fuel Share of Carbon Dioxide Emissions (2001E): Oil (44%), Coal (36%), Natural Gas (20%)
Renewable Energy Consumption (2003E): 6.1 quadrillion Btu (about 45% of which was conventional hydroelectric power)
Status in Climate Change Negotiations: Annex I country under the United Nations Framework Convention on Climate Change (ratified October 15th, 1992). Under the negotiated Kyoto Protocol (signed on November 12th, 1998 - not ratified), the United States agreed to reduce greenhouse gases 7% below 1990 levels by the 2008-2012 commitment period.
Major Environmental Issues: Air pollution resulting in acid rain in both the US and Canada; the US is the largest single emitter of carbon dioxide from the burning of fossil fuels; water pollution from runoff of pesticides and fertilizers; very limited natural fresh water resources in much of the western part of the country require careful management; desertification.
Major International Environmental Agreements: A party to Conventions on Air Pollution, Air Pollution-Nitrogen Oxides, Antarctic-Environmental Protocol, Antarctic Treaty, Climate Change, Endangered Species, Environmental Modification, Marine Dumping, Marine Life Conservation, Nuclear Test Ban, Ozone Layer Protection, Ship Pollution, Tropical Timber 83, Tropical Timber 94, Wetlands and Whaling. Has signed, but not ratified, Air Pollution-Persistent Organic Pollutants, Air Pollution-Volatile Organic Compounds, Biodiversity, Desertification, Hazardous Wastes.

* The total energy consumption statistic includes petroleum, dry natural gas, coal, net hydro, nuclear, geothermal, solar, wind, wood and waste electric power. The renewable energy consumption statistic is based on International Energy Agency (IEA) data and includes hydropower, solar, wind, tide, geothermal, solid biomass and animal products, biomass gas and liquids, industrial and municipal wastes. Sectoral shares of energy consumption and carbon emissions are also based on IEA data.

ENERGY INDUSTRY
Major U.S. Oil Companies (2002): ExxonMobil, ChevronTexaco, ConocoPhillips, Marathon, Amerada Hess, Anadarko, Unocal
Major U.S. Coal Companies (2001): Peabody Coal Sales.; Arch Coal; Kennecott Energy Co.; Consol Energy; RAG American Coal Holding; Horizon Natural Resources; A.T. Massey; Vulcan Partners; North American Coal; TXU
Oil Pipelines (2001E): Around 2 million miles **Natural Gas Transmission Pipelines (2000E):** 250,000 miles
Major Ports: Baltimore, Chicago, Hampton Roads, Houston, Los Angeles, New Orleans, New York, Philadelphia

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Sources for this report include: Associated Press; Christian Science Monitor; Dallas Morning News; Dow Jones; EIU Viewswire; Energy Daily; Energy Report; Financial Times; Financial Times Energy Newsletters; Gas Daily; Global Insight; Houston Chronicle; Los Angeles Times; Megawatt Daily; New York Times; Oil and Gas Journal; Oil Daily; Petroleum Intelligence Weekly; Pipeline and Gas Journal; Platts Oilgram News; PR Newswire; Reuters; U.S. Energy Information Administration (numerous publications -- see links); USA Today; Washington Post; Weekly Petroleum Argus; World Gas Intelligence; World Markets Online; World Oil.

LINKS

For more information on U.S. energy, see these other sources on the EIA web site:
EIA - Short-Term Energy Outlook
EIA - Annual Energy Outlook

EIA - Monthly Energy Review
EIA - Petroleum Page
EIA - Natural Gas Page
Natural Gas Annual
EIA - Nuclear Page
EIA - Coal Page
EIA - Electricity Page
Electric Power Annual
EIA - Renewable Fuels Page
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Links to other U.S. government sites:
CIA World Factbook - U.S.
U.S. Department of Energy's Office of Fossil Energy Home Page
U.S. Department of Energy: United States report
U.S. Department of Energy Home Page
U.S. Nuclear Regulatory Commission
Federal Energy Regulatory Commission
National Association of State Energy Officials
National Renewable Energy Laboratory (NREL)

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National Petroleum Council
Independent Petroleum Association of America
Petroleum Marketers Association of America
National Petroleum Refiners Association
American Gas Association
National Mining Association
Electric Power Research Institute
Edison Electric Institute
North American Electric Reliability Council
Nuclear Energy Institute
Global Climate Coalition
Resources for the Future
Export Council for Energy Efficiency
Alliance to Save Energy
American Solar Energy Society
Solar Energy Industries Association
American Wind Energy Association
Geothermal Energy Association
American Bioenergy Association

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