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**PETROLEUM AND PETROLEUM PRODUCTS  
IN MONTANA**

MARCH 2003

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**Department of Environmental Quality**  
for the  
**Environmental Quality Council**

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The chance that foreign events will disrupt the petroleum markets is growing. Though the sources of the petroleum products used in Montana are relatively secure, Montana is part of an international market. Price changes in that market are quickly reflected in the Montana market. Steep increases in the price of petroleum products will affect all Montanans. This report provides the background information the Legislature and the public may need to respond to energy disruptions that may occur.

## PETROLEUM AND PETROLEUM PRODUCTS IN MONTANA

### Montana Petroleum Quick Facts (in round numbers)

Recent production: 16 million barrels per year

Amount of crude production exported: 75 percent

Refineries in state: Billings (2), Laurel, Great Falls

Crude receipts at refineries: 57 million barrels per year

Source of crude refined in state:

Montana – 6 percent

Alberta – 73 percent

Wyoming – 22 percent

Amount of liquid fuel refined products exported: 55 percent

States petroleum products are exported to:

Washington

North Dakota

Wyoming (and points south)

Montana consumption of petroleum products: 31 million barrels (includes refinery usage)

Gasoline sold in-state: 500 million gallons

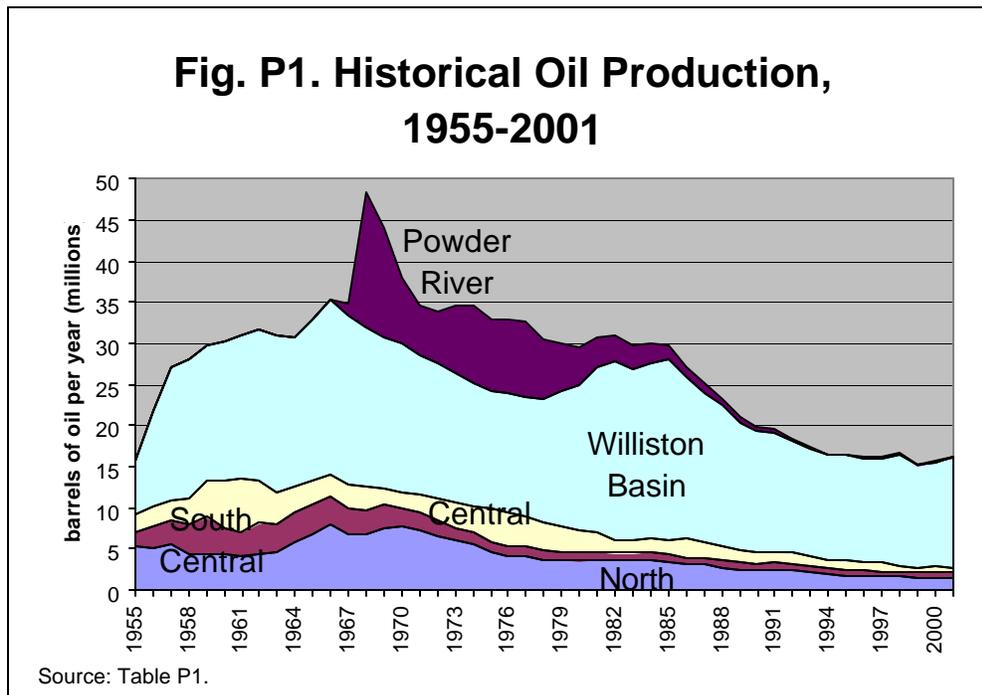
Diesel fuel sold in-state: 300 million gallons (includes railroad usage)

### Production History

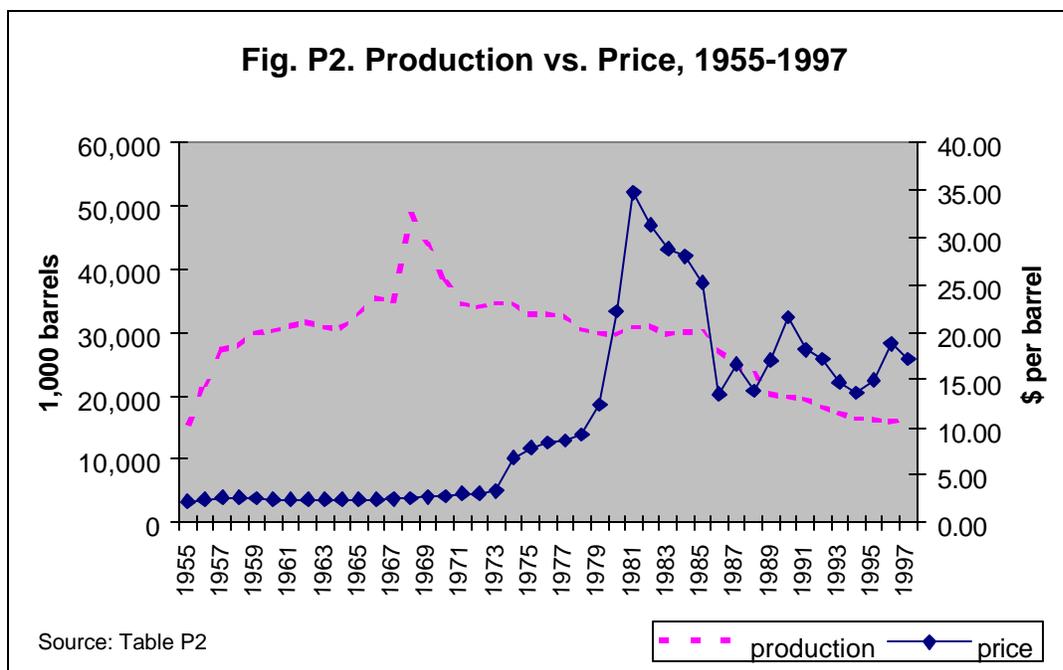
The first oil wells drilled in Montana were located in the Butcher Creek drainage between Roscoe and Red Lodge, beginning in 1889. These wells were not very successful. The first significant oil production in the state came from wells drilled in the northward extension of Wyoming's Elk Basin field in 1915, southeast of Belfry. Montana's first new oil field was Cat Creek, near Winnett, discovered in 1920, soon followed by the Kevin Sunburst field discovery in 1922. Over the next 40 years, more oil fields were developed in the Williston Basin (northeast Montana), the Sweetgrass Arch (northern Montana), the Big Snowy Uplift (central Montana), the northern extensions of Wyoming's Big Horn Basin (south central Montana) and the Powder River Basin (southeastern Montana).

Montana's petroleum production peaked in 1968 at 48.5 million barrels (1 barrel = 42 gallons), the result of cresting Williston Basin production combined with a surge of production from the newly discovered Bell Creek field in the Powder River Basin (Table P1; Fig. P1, below). Production then declined quickly until 1971, when a series of world oil supply shocks began to push prices upward, stimulating more drilling. Production remained relatively stable between 1971 and 1974 as Powder River Basin output increased to match a decline in

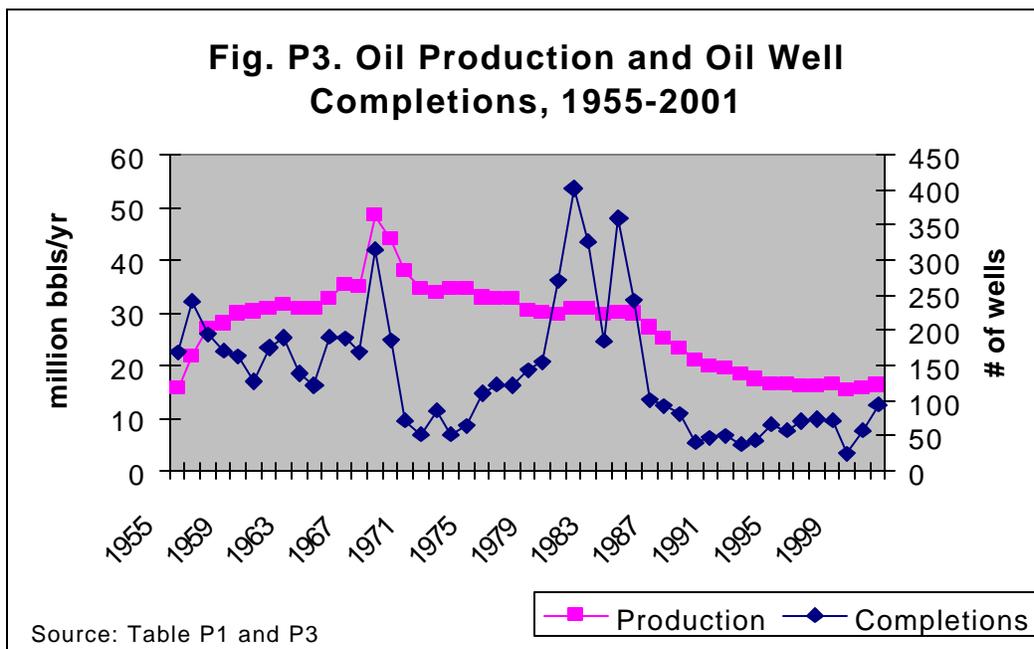
Williston Basin output. After 1974 production began to decline, despite the continued escalation of oil prices (Table P2).



World oil price shocks following the Iran crisis in 1979 sparked a drilling boom, which peaked at 1,149 new wells of all types in 1981 (Table P3). That year, the average price of Montana crude climbed to almost \$35 per barrel. While the increase in the price of oil encouraged more drilling, it did little to increase Montana production (Fig. P2). The drilling



produced a high percentage of dry holes and was unable to slow the decline in statewide production (Fig. P3). Output increased in the Williston Basin during the early 1980s, but this was matched by a steep decline in output from other areas. Production declined significantly following the drop in world oil prices in 1985, stabilizing around 16 million barrels per year in the mid-1990's. Wells in Montana are not that prolific, averaging around 15 barrels per day in recent years (Table P1).



## Refineries and Pipelines

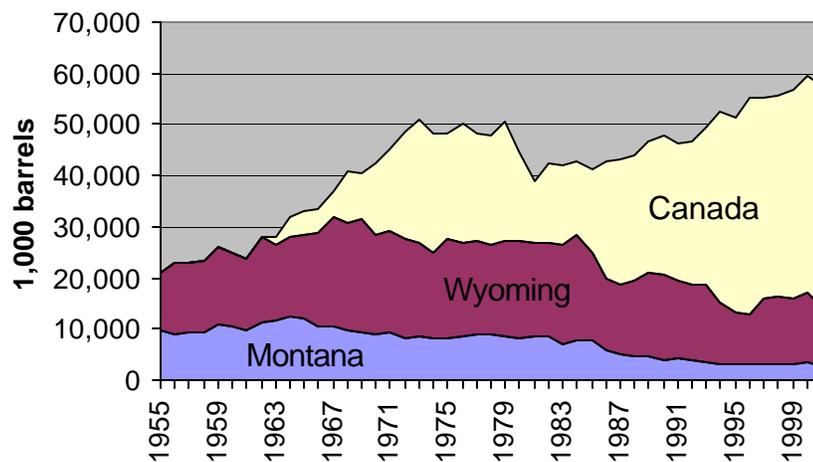
Petroleum pipelines serving Montana consist of three separate systems (see Map, below.) One bridges the Williston and Powder River basins in the east and the other two link the Sweetgrass Arch, Big Snowy and Big Horn producing areas in central Montana. (A fourth—Express—primarily carries Canadian crude through Montana.) All these systems also move crude oil from Canada to Montana and Wyoming. In recent years, 75-80 percent of Montana oil production has been exported from the state, mostly to Wyoming through the eastern pipeline system. This pipeline system is not connected to any of the Montana refineries, which limits the amount of Montana crude they can use.

Montana refineries now use around 57 million barrels of crude a year (Table P4). In the last decade, only 5-10 percent of that came from Montana crude. Oil fields in the Sweetgrass Arch, Big Snowy and Big Horn areas provided crude to the four Montana refineries: Cenex in Laurel, Montana Refining in Great Falls, ConocoPhillips and ExxonMobil in Billings. Collectively, 70-75 percent of their crude oil came from Alberta, Canada and around 20 percent came from Wyoming. The shipments from Canada have increased since the late 1960s, as Montana oil production and imports of Wyoming crude declined. (Fig. P4, below)

## MAP: Petroleum Pipelines in Montana



**Fig. P4. Refinery Receipts by Source of Oil, 1955-2001**



Source: Table P4

The refineries vary in their sources of crude inputs (Table P5). ConocoPhillips is the most dependent on Canadian crude, taking an average (1996-2001) of 94 percent of its total receipts from Canada. ExxonMobil is the least dependent on Canadian crude (39 percent of receipts) but by far the most dependent on Wyoming (56 percent of receipts).

Almost all of refinery output is moved by pipeline. Montana refineries ship their products to Montana cities and east to Fargo, North Dakota (Cenex pipeline), to Wyoming and further south (Conoco Seminole pipeline) and west to Spokane and Moses Lake, Washington (Conoco Yellowstone pipeline). In 2001, 25 million barrels of product were shipped out of state, with almost half heading south and over a third heading west.

The four refineries provided almost all of the petroleum products consumed in Montana. Beyond that, around 50-55 percent of the liquid fuel produced at the refineries is exported. Montana refineries provided about 10% of Washington's gasoline and distillate in 2001. That same year, North Dakota received over a quarter of its gasoline and distillate from Montana refineries.

## **Petroleum Products Consumption**

Petroleum product consumption in Montana peaked at 33 million barrels in 1979 (Table P6). It then drifted lower, settling in the mid-1980's around 24 million barrels per year. After that, consumption began a slow climb, to around 31 million barrels per year at present.

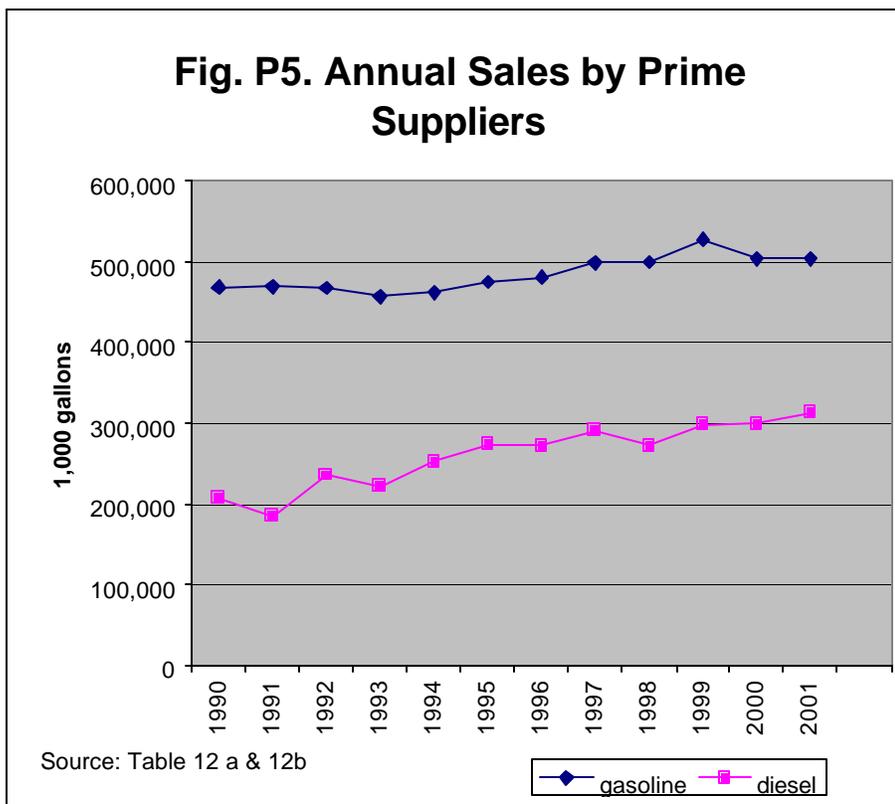
The transportation sector is the single largest user of petroleum and the second largest user of all forms of energy in Montana. In 1999, 38 percent of consumption was in the form of motor gasoline, 28 percent was distillate, mostly diesel fuel, and 9 percent was asphalt and road oil. Another 19 percent was consumed in petroleum industry operations (Table P6).

Gasoline use peaked in 1978, at half a billion gallons, dropped and slowly climbed back to around that level currently, with minor fluctuations since the mid-1990s (Tables P10 and P11). Diesel use generally has increased since the 1970's, though use may be flattening out now. During the 1990's, highway diesel use grew at a far greater rate than did gasoline use (Tables P11; Fig. P5, below).

The fluctuations in demand for gasoline and diesel fuel since 1970 reflect changes in the state and national economy and the international price of oil. The embargo by the Organization of Petroleum Exporting Countries (OPEC) in 1973-1974 and the Iranian crisis of 1979-1980 drove prices up and demand down. The increase in prices prompted advances in vehicle efficiency and a fuel switch by heavy-duty trucks from gasoline to diesel. The crash in international prices in 1985, the economic growth of the 1980's and 1990's, along with the decline in vehicle fleet fuel efficiency in recent years pushed gasoline and diesel demand back up.

Fuel use shows a cyclical rise and fall through the year (Tables 12a and 12b; Fig. P6, below). Use tends to rise during the summer months and taper off during the winter. Diesel use also shows a modest peak in the spring, and a greater one at the end of the summer, possibly due to agricultural sector use. The winter trough in fuel use is more than a third lower from the summer peak. This seasonal pattern is caused both by variations in the use of Montana's one million vehicles and by the increase in tourist traffic during the summer.

The price of gasoline has been rising over the last decade, most significantly in the last few years (Table P13 and P14; Fig. P7) The price of gasoline can vary significantly around the state, a fact that is masked by the data, which only are available as statewide averages. (Complete data on the Montana price of diesel were not available.) The price of gasoline has a cyclical rise and fall, just like demand for gasoline; however, price lags demand, with peak prices tending to appear after the peak driving season (Fig. P8).

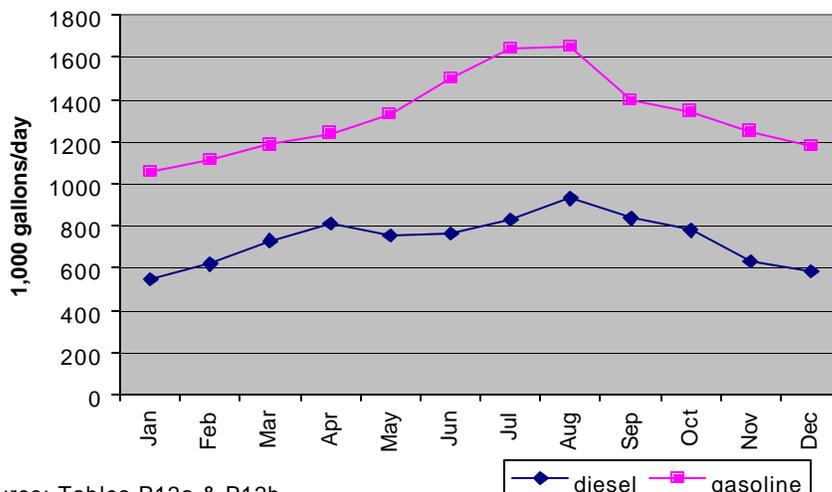


Note: Prime suppliers are those who provide product to local distributors or retailers.

### Comments on the data

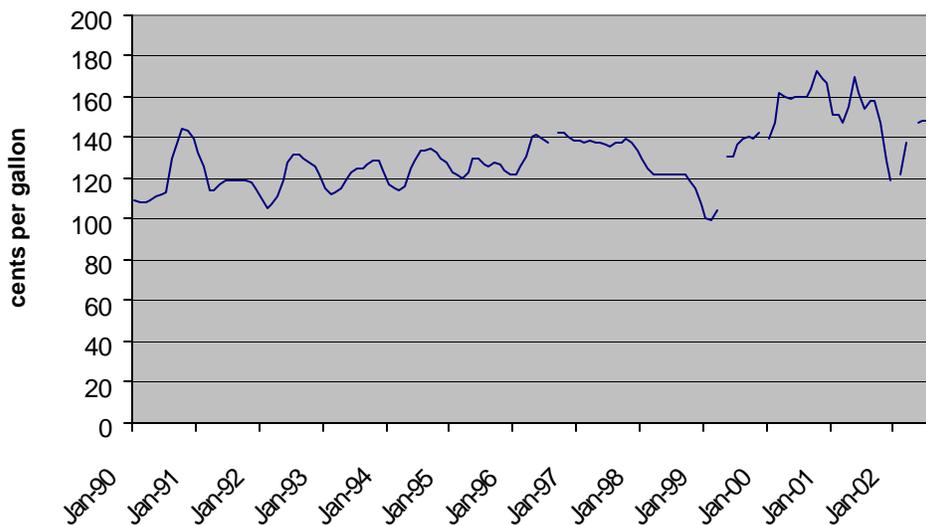
Data for this report come from a variety of sources, which don't always agree exactly. In part this is due to slightly different data definitions and methods of data collection. The reader should always consider the source and context of specific data.

**Fig. P6. Average Monthly Sales by Prime Suppliers, 1990-2001**



Source: Tables P12a & P12b

**Fig. P7. Retail Price of Gasoline, 1990-2002\***



\* Average of all grades of gasoline statewide, in nominal dollars (some data missing).

Source: Table P13

