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ENERGY HIGHLIGHTS

Federal Reserve Bank of Dallas April 1985

Changes in Energy Markets Reduce Regional Effects of Energy Price Movements

In the past, movements in energy prices were assumed to have the largest effect on residents of the Upper Midwest and the Northeast. Households in those regions used more petroleum and total energy per capita than households in other regions. Shifts in consumption patterns, caused by major increases in energy prices and by natural gas deregulation, have changed this situation. Now, changes in energy prices—such as those resulting from additional taxes on oil—can be expected to have more equal effects on residents of different regions.

Energy Conservation

Between 1973 and 1982, average energy prices rose over 300 percent in the wake of a 719-percent increase in the price of crude oil. In response to higher energy costs, the trend toward increasing per capita energy consumption was reversed, and per capita residential energy consumption fell 8 percent between 1973 and 1982.

The reduction in consumption was especially strong in areas that used large amounts of energy. Chart 1 illustrates the changes in per capita residential energy consumption for three Census divisions: New England, the East North Central, and the West South Central. Between 1973 and 1982 per capita energy consumption declined in all three divisions, with the largest reduction, 22 percent, registered by New England. By 1982, in fact, per capita residential energy consumption in New England was 5 percent below average consumption in the West South Central.

Fuel Switching

Higher prices for oil and natural gas also resulted in a shift in the mix of fuels consumed in the residential sector. In all three divisions, per capita (and total) residential petroleum consumption fell (Chart 1). Petroleum consumption in New England fell from 53 percent of residential energy consumption in 1973 to only 35 percent in 1982. Consumption in the other divisions also became less oil-intensive.

Fuel switching is more apparent if electricity consumption is apportioned to the fuel used to generate the power (Chart 2). Increases in oil and natural gas prices had the largest total effect on households in New England and the West South Central and led to the most fuel switching. Oil fell from 66 percent to 41 percent of the fuel used to generate electricity in New England, while natural gas declined from 87 percent to 59 percent of the fuel used by electric utilities in the West South Central. The smallest decline in per capita consumption of oil and natural gas was registered in the East North Cen-

(Continued on back page)

Falling Oil Prices Induce Early Phaseout of Windfall Profit Tax

The windfall profit tax has moderated the effect of falling oil prices in reducing domestic oil exploration and development. After-tax oil company revenues have declined relatively less than oil prices because part of the decline was offset by lower tax liability under the Crude Oil Windfall Profit Tax Act of 1980. Recently, however, windfall profit tax payments decreased as a fraction of oil revenues, reducing the insulation of producers from falling prices. As a result, producers will bear a greater share of any further price declines. In turn, price changes will have a greater effect on drilling.

Tax on Windfall Profits

The windfall profit tax was enacted in order to extract from oil producers some of the increased revenue gained as domestic oil prices rose after decontrol. The law established three categories (tiers) of oil, to which slightly different taxes apply. These tiers simplified the classifications used for oil price controls. The tax is applied to the difference between the actual price received for a particular category of oil and the base price established for that tier by the law. The base price for each tier is set to approximate the price that oil in the category would have received had oil price controls continued. The Tier 1 and Tier 2 base prices are allowed to rise at the rate of inflation, but the Tier 3 base price rises at an an-

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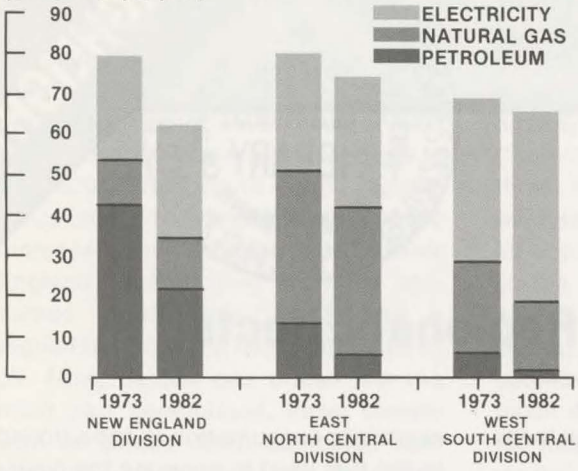
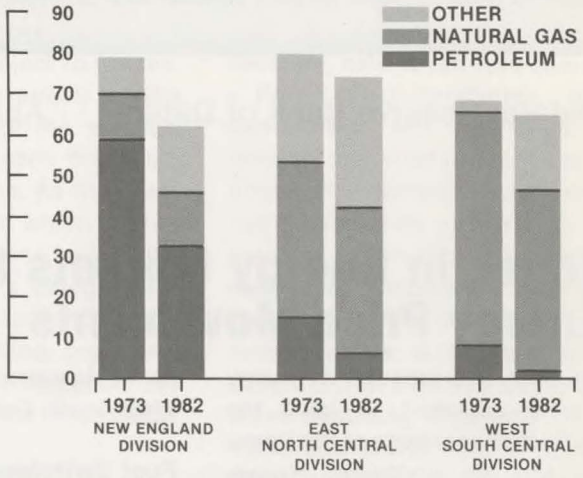
Chart 1
Per Capita Residential Energy Consumption
(Million Btu per year)



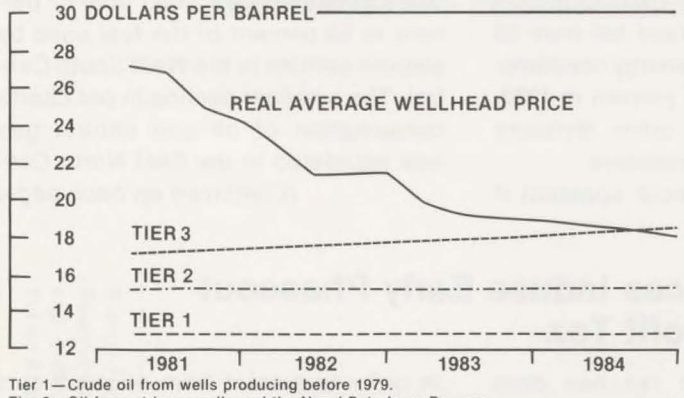
SOURCE: U.S. Department of Energy.
NOTE FOR BOTH CHARTS: New England Division (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont), East North Central Division (Illinois, Indiana, Michigan, Ohio, and Wisconsin), West South Central Division (Arkansas, Louisiana, Oklahoma, and Texas).

Chart 2
Per Capita Residential Energy Consumption With Electricity Consumption Attributed To Fuel Input
(Million Btu per year)



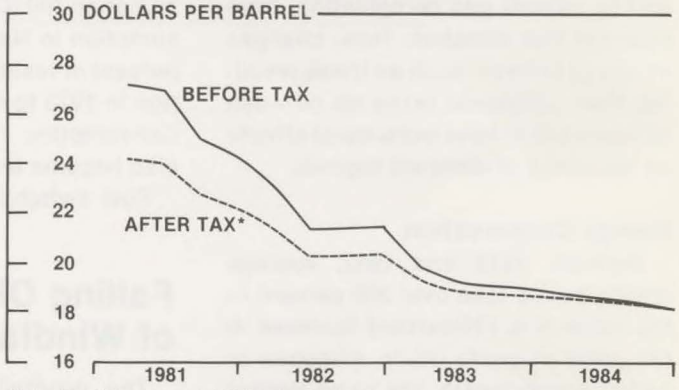
SOURCES: U.S. Department of Energy.
Federal Reserve Bank of Dallas.

Chart 3
Base Prices Under The WPT and Real Price of Domestic Crude Oil



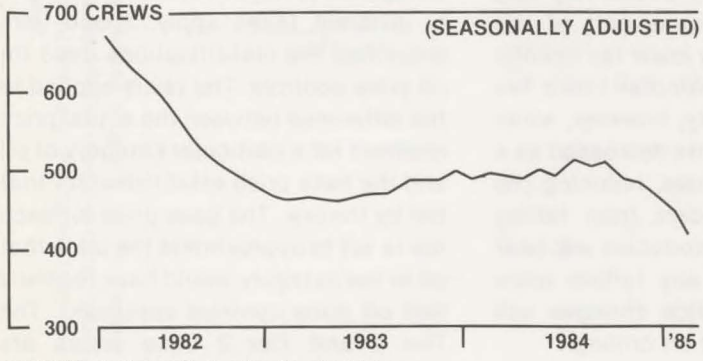
Tier 1—Crude oil from wells producing before 1979.
Tier 2—Oil from stripper wells and the Naval Petroleum Reserve.
Tier 3—Newly discovered oil, heavy oil and incremental tertiary oil.
SOURCE: U.S. Department of Energy.

Chart 4
Domestic Crude Oil Prices Before and After Windfall Profit Tax



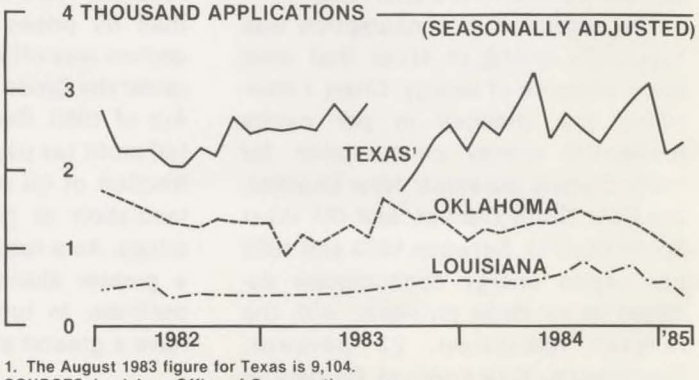
*Using Tier 3 base price and 22.5 percent tax rate.
SOURCES: U.S. Department of Energy.
Federal Reserve Bank of Dallas.

SEISMIC CREW COUNT



SOURCES: Society of Exploration Geophysicists.
Federal Reserve Bank of Dallas.

WELL PERMIT APPLICATIONS



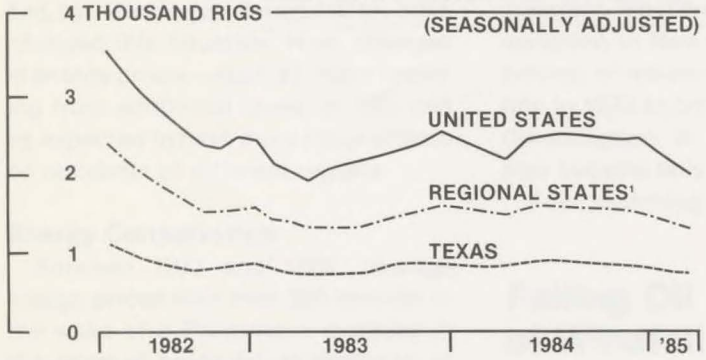
1. The August 1983 figure for Texas is 9,104.
SOURCES: Louisiana Office of Conservation.
Oklahoma Corporation Commission.
Texas Railroad Commission.
Federal Reserve Bank of Dallas.

ENERGY BRIEFS

Firmer oil prices have abated the decline of the Eleventh District energy sector, but the industry shows few prospects for significant improvement. Much uncertainty about the future path of prices remains.

- A number of demand factors make further downward pressure on oil prices possible. The main influence is the normal seasonal downturn in demand each spring. Another is the settlement of the British coal miners' strike; the strike had added half a million barrels per day to crude oil demand in recent months. Continued production discipline by the Organization of Petroleum Exporting Countries and lower than normal inventories of crude oil and petroleum products in the United States and Europe could offset these pressures, however.
- Pessimism about the outlook for oil prices has reduced drilling activity. Even after adjusting for the normal seasonal downturn, the rig count fell 9.8 percent in Texas and 19.4 percent in the nation during the first quarter. Recent firming in oil prices has not arrested the decline.
- Well permit applications and the seismic crew count, both leading indicators of drilling, suggest that an upturn in drilling is unlikely. Well permit applications in February fell on a year-to-year basis in Texas, Louisiana, and Oklahoma. The U.S. seismic crew count, like the rig count, is also declining.
- The effects of depressed drilling have spread to employment in oil field machinery manufacturing. Through February, this indicator had declined for four straight months in Texas. On a year-to-year basis, however, employment in this sector was 8.1 percent higher in February.
- Higher product prices have helped reverse the long slide in refining employment. This indicator has risen slightly in Texas in December, January, and February. Employment in this sector remains below its level a year earlier, however. Refinery production in the state increased in December although less strongly than in the nation.

ROTARY DRILLING RIGS RUNNING



1. Louisiana, New Mexico, Oklahoma and Texas.
SOURCES: Hughes Tool Company.
Federal Reserve Bank of Dallas.

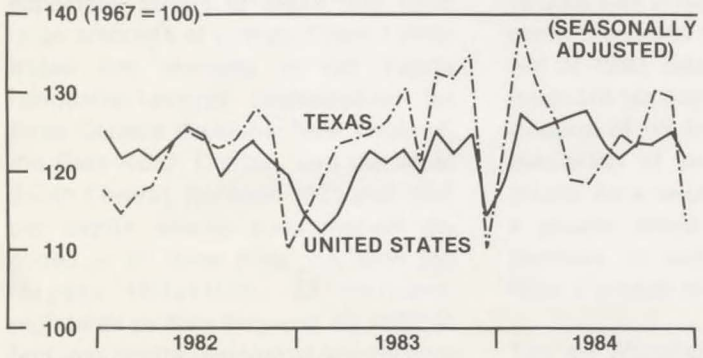
CRUDE OIL PRODUCTION AND NATURAL GAS EXTRACTION

(Seasonally Adjusted)

	Percent change from previous quarter 1984				Daily average 1984:Q4
Oil	Q1	Q2	Q3	Q4	Thousand barrels
Texas	3.2	-1.0	0.1	-0.6[2]	2,455[2]
Regional states[1]	3.6	0.2	0.1	-0.6[2]	4,535[2]
United States	0.2	0.7	0.5	0.7	8,845
Gas					**Million cubic feet**
Texas	2.9	-1.6	-1.5	-0.6[2]	16,488[2]
Regional states[1]	5.1	-1.1	-1.4	0.3[2]	40,541[2]
United States	0.3	-1.9	-1.1	0.1	46,334

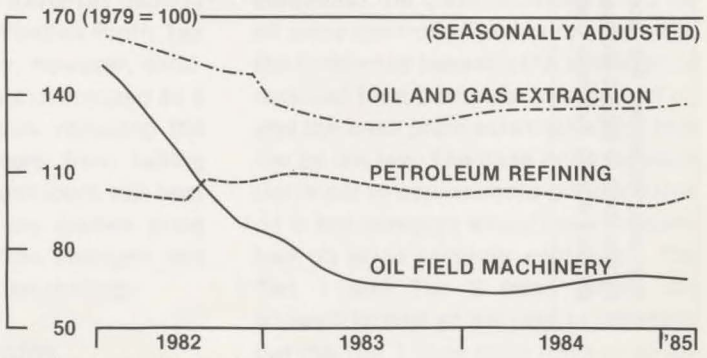
1. Louisiana, New Mexico, Oklahoma, and Texas.
2. Preliminary figures.
SOURCES: U.S. Department of Energy.
Federal Reserve Bank of Dallas.

REFINERY PRODUCTION



SOURCES: Board of Governors, Federal Reserve System.
Federal Reserve Bank of Dallas.

TEXAS ENERGY EMPLOYMENT



SOURCES: U.S. Bureau of Labor Statistics.
Federal Reserve Bank of Dallas.

Energy Markets (cont.)

tral, which relied almost exclusively on coal for electricity generation.

Price Deregulation

Natural gas deregulation contributed to the equalization of energy price effects on households in different regions. When oil prices rose in the 1970s, West South Central households faced lower average energy price increases than households in New England because they primarily consumed natural gas, which had a regulated price held below the price of oil. Now, natural gas prices, for the most part deregulated, move closely with oil prices. With combined consumption of oil and gas becoming more similar in the different Census divisions (Chart 2), the regional effects of oil price movements are more equal today than in 1972.

—Ronald H. Schmidt and Roger H. Dunstan

Falling Oil Prices (cont.)

nual rate of 2 percentage points above inflation. Windfall tax rates currently vary from 22.5 percent to 70.0 percent.

The windfall profit tax is scheduled for elimination in 1991, but falling oil prices have meant that some oil already is no longer subject to the tax. Chart 3 presents base prices for the three tiers of oil and the average wellhead price of domestic crude oil, all adjusted for inflation. As the chart shows, the difference to which the tax applies has declined since early 1981. In fact, for Tier 3 oil, a category accounting for most exploratory and much development drilling, producers no longer pay the tax because the market price of this oil has fallen below its base price.

Effect on Drilling

With the windfall profit tax in effect, federal tax payments have fallen along with oil prices, dampening the decline in after-tax oil prices and moderating the concomitant decline in drilling. This effect is apparent in the before-tax and after-tax prices received for Tier 3 oil (Chart 4). Although both series have declined, after-tax prices, which are more relevant to the drilling decision, have fallen less sharply.

For Tier 3 producers, the U.S. Government will no longer share, through the windfall profit tax, in any future price declines. Furthermore, the rising base price of Tier 3 oil and the eventual elimination of the tax will mean that producers in this tier will benefit more fully from any future price increases. As a consequence, producers of Tier 3 oil may alter their decisions regarding exploration, development, and production. With *de facto* repeal of the windfall profit tax for Tier 3, drilling could become more responsive to changes in price.

—William T. Long III and Stephen P. A. Brown

Energy Highlights is published quarterly by the Federal Reserve Bank of Dallas. Additional copies of most issues and subscription information are available from the Public Affairs Department.