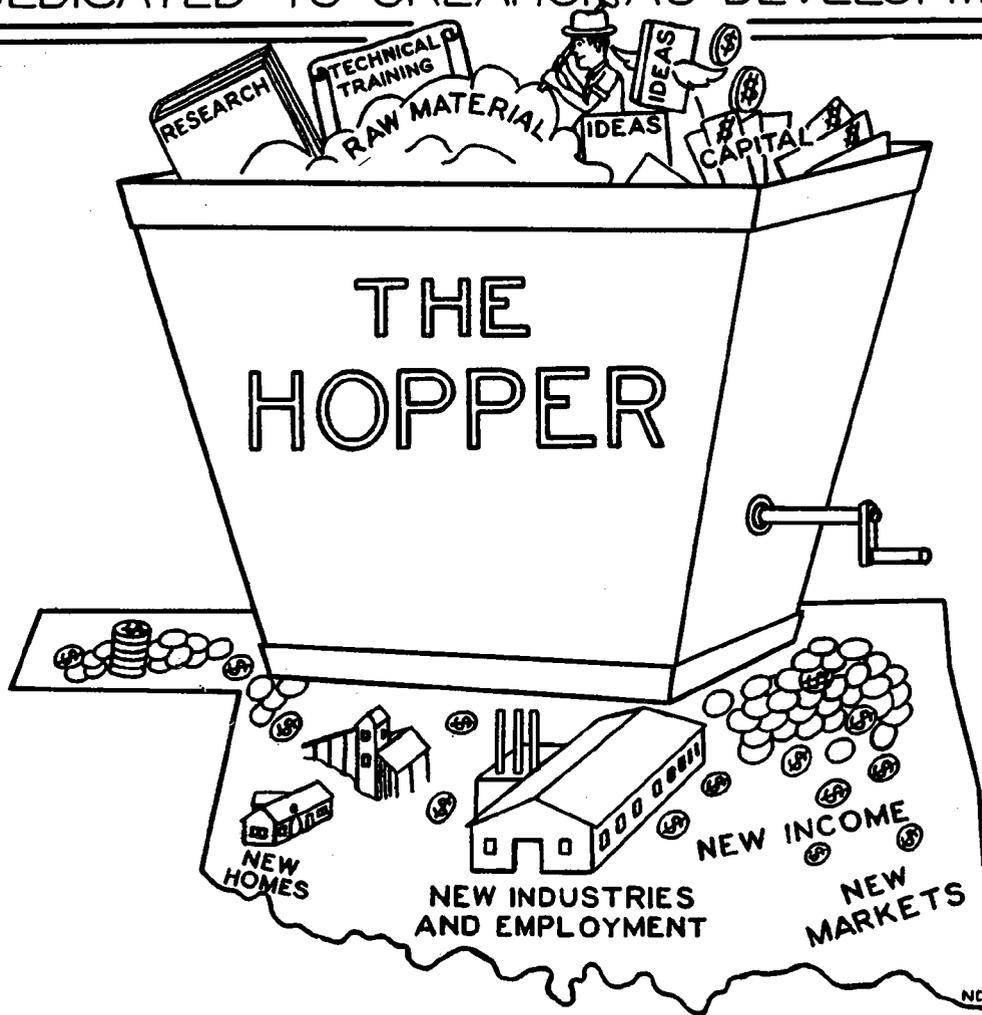


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THE GLASS INDUSTRY

Glass in Oklahoma

It is impossible to judge the size of the Oklahoma glass industry solely by the number of plants in operation. For example, the state of Oklahoma, with only 1.47 percent of the U. S. population, is estimated to produce approximately 15 percent of the window glass of the nation. At the start of 1916 there were 71 window glass manufacturing firms in the United States whereas less than 10 firms supply the tremendous market of today. The size and importance of the industry can be most readily gauged by the fact that in 1944 Pittsburg Plate Glass reported the total United States annual output of sheet glass as being in excess of one billion square feet per year. Of the individual factories (numbering 14) only four are located west of the Mississippi River—one each in Arkansas and Louisiana, and two in Oklahoma.

The Oklahoma sheet glass plants are the American Window Glass Company at Okmulgee and the Pittsburg Plate Glass Company, Works No. 10, at Henryetta. The latter, the largest window glass factory west of the Mississippi River, reported in 1950 the weekly output of the Henryetta plant was sufficient to glaze 30,000 average six-room houses if all were used in residences. No figures are available on the amount of glass produced by the large American Glass Company which competes for glass business available in the fast growing trade centers of the Southwest, the West Coast, and the Northwest.

According to the 1950 Glass Factory Directory, five firms represented by seven factories produce the wire glass for the building trade of the nation. Four of these factories are located east of the Mississippi River. Oklahoma has the only wire glass factory between St. Louis, Missouri, and Fullerton, California. Southwestern Sheet Glass Com-

pany was organized in 1919 in Okmulgee; their products can be found in the stock of glass jobbers in practically every large city in western United States. Southwestern Sheet Glass Company's wire glass is an approved fire retardent and is regularly inspected by the Underwriters' Laboratories, Inc. In addition to different types of wire glass they also manufacture figured glass and heat absorbing glass.

Bottle and hollow ware factories are well represented in Oklahoma with a total of six plants in operation at the present time. Liberty, one of the oldest plants in Oklahoma, specialized in returnable glass containers for the dairy and carbonated beverage trade. Numbered among their many customers are manufacturers of dozens of nationally known products. Liberty bottles are in use in Alaska, Cuba, Puerto Rico, and 28 states of the Union. The Brockway Company using a furnace capable of melting 110 tons of glass in 24 hours, manufactures bottles of a variety of types: narrow and wide mouth food bottles, carbonated beverage bottles, wine bottles, narrow mouth pharmaceutical bottles, flavoring extract bottles, and prescription bottles. The remaining four plants (the two of Hazel-Atlas Glass Company, and one each of Ball Brothers Company, Inc. and Alexander H. Kerr & Company, Inc.) manufacture a more general line of containers--fruit jars, jelly glasses, bottles, and miscellaneous packers ware. It is impossible to get a present day breakdown of the percentage of total U. S. containers produced in Oklahoma. However, it is known that in 1939 the five container ware factories then operating in Oklahoma produced 20 percent of the total U. S. production of pressed ware, fruit jars, and jelly glasses. (packers ware and home pack). In 1939 this class of ware was produced by a total of 21 plants in the United States.

Eartlett-Collins, another early Oklahoma firm, is the only manufacturer of table glass ware west

of the Mississippi River. They are well-known in the Southwest for their line of popular priced table glass ware and beverage tumblers. The Corning Glass works specializes in coffee maker bowls; the Overmeyer-Perram Glass Company manufactures glass mail boxes, glass urn lamps, and other specialities in pressed and blown glass. The Scott Depot Glass Company is possibly the most diversified of all the plants, manufacturing communion glasses, hurricane chimneys, common lamp chimneys, reproductions of Venetian glass ware in swans, cornucopias, morning glories, and other types of ornamental vases.

The most certain thing about the future of the glass industry in the United States is that the peak of the demand for glass, men's most versatile creation, is not yet in sight. New knowledge gained and great developments made in creating new types of glass to answer specific needs were the direct result of war time demands on the glass industry of the nation. In turn, the research engineers have adapted the new glass to peace time uses. Many of the special types of aircraft glasses made for the bomber and fighter planes are now found in the giant passenger liners of the commercial air lines of the nation. The increase in the number of square feet of glass used in the family car and truck cab has provided additional comfort and safety for the occupants. The modern, stream-lined railroad train is one of the best examples of spectacular application of the new glass. The Vista Dome, the raised portion of the modern railroad passenger car, is not unlike an observation post from which the traveler can gain a new concept of the American countryside. The dome is enclosed with glass units made of Flexseal, safety plate, and Solex heat-absorbing glasses.

In the construction field such new products as Twindow and fiber glass insulation are the glass manufacturers' answer to the problems of annoying

drafts and heat loss occasioned with standard windows. Glass products, such as Foamglas and glass blocks, are among the important and widely used insulation materials that make it possible to modernize and air-condition industrial and business establishments. Architecturally, the trend is toward larger glazed areas in virtually all types of buildings.

The results of glass research are apparent to the most casual observer, as is the over-all increase in use of glass. The technicians appear to have as their goal "better 'glass' for better living". As this is being written, restrictions are once more going into effect on the use of many critical minerals. This in turn will be directly reflected in greater demands on the glass manufacturer.

To the Oklahoman, interested in the industrial future of Oklahoma and of the Southwest, the significant question is what part his state will play in this Glass Age. Oklahoma can offer the glass manufacturer one of the best groupings of natural resources ever offered any industry--vast deposits of glass sand, limestone, dolomite, and natural gas supply whose reserve is estimated at the close of 1950 to be in excess of 11,600 billion cubic feet. In addition, Oklahoma is near the center of the area containing 88 percent of the estimated gas reserves of the United States. With a net work of pipe lines, including several major trunk lines that cross the state, Oklahoma is reasonably certain to have natural gas for industrial use as long as it is available in any area in the United States.

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Errata: Oklahoma glass sand, by error in consulting an out-of-state reference, was on page 39 of the April issue of the Hopper reported unsuitable

for the manufacture of optical glass. The statement from this early reference is untrue, for a special grade of sand suitable for making optical glass has been marketed in the past from Oklahoma deposits. Sand containing less than 0.020 percent Fe_2O_3 has been shipped and some is known to have been used for the manufacture of optical glass. Production for this use, however, is extremely small and most of the glass sand from Oklahoma is used for making ordinary glass containers and flat glass such as window panes.

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Estimated Proved Recoverable Reserves of Natural Gas, December 31, 1950

Compiled from Reports on Proved Reserves of Crude Oil, Natural Gas Liquids, and Natural Gas, December 31, 1950, Volume 5, published jointly by American Gas Association and American Institute.

(Volumes calculated at a pressure base of 14.65 psi, absolute, and at a standard temperature of 60° F.)

	Millions of Cu. Ft.	Percent of total U. S. Reserves
Oklahoma	11,634,287	6.7
South West (Kans., N. Mex., Okla., Tex., La.)	163,353,134	88.0
Total U. S.	185,592,699	

Natural Gas Costs of Industries Manufacturing Stone, Clay, and Glass Products

Compiled from 1949 Gas Facts published by American Gas Association Bureau of Statistics.

Area	State	Rate per 1000 cu. ft.
East of Mississippi River	West Virginia	24.4¢
	Indiana	25.5¢
	Illinois	28.4¢
	Ohio	34.1¢
	Pennsylvania	34.7¢
	New York	58.1¢
West of Mississippi River	Louisiana	9.5¢
	Oklahoma	10.2¢
	Texas	11.2¢
	Arkansas	11.4¢
	Kansas	12.5¢
	Missouri	21.4¢
Pacific Coast	California	26.6¢

Proved Reserves of Oklahoma
Petroleum Gain in 1950

Estimated proved reserves of the United States made a gain of 618,909,000 barrels during the year 1950, according to a report of the Committee on Petroleum Reserves of the American Petroleum Institute. During the same period, proved petroleum reserves of Oklahoma gained 66,995,000 barrels. Oklahoma also showed net gains in the estimated reserves of natural gas liquids and in natural gas.

The estimates of the Committee on Petroleum Reserves and of the Committee on Natural Gas Reserves of the American Gas Association are contained in Reports on Proved Reserves of Crude Oil, Natural Gas Liquids, and Natural Gas, published jointly by the American Gas Association and the American Petroleum Institute. The estimates are given as of December 31, 1950. The report contains tables giving the estimates by states, totals for the United States, and includes estimates of new discoveries, revisions and extensions of old fields, and production for the year.

The following excerpts regarding the estimates are taken from the statements of the Committee on Petroleum Reserves:

"The estimates in this report, as in all previous annual reports of this committee, refer solely to proved or blocked-out reserves. They include only oil and natural gas liquids recoverable under existing economic and operating conditions.

"The estimates made for this report by your committee do not include:

1. Oil under the unproved portions of partly developed fields.
2. Oil in untested prospects.
3. Oil that may be present in unknown pros-

- pects in regions believed to be generally favorable.
4. Oil that may become available by fluid injection methods from fields where such methods have not yet been applied.
 5. Oil that may become available through chemical processing of natural gas.
 6. Oil that can be made from oil shale, coal, or other substitute sources.

"Proved reserves are both drilled and undrilled. The proved drilled reserves, in any pool, include the oil estimated to be recoverable by the production systems now in operation, whether with or without fluid injection, and from the area actually drilled up on the spacing pattern in vogue in that pool. The proved undrilled reserves, in any pool, include reserves under undrilled spacing units which are so close, and so related, to the drilled units that there is every reasonable probability that they will produce when drilled.

"The committee again wishes especially to stress the fact that its estimates of proved reserves cannot be used in measuring the rate at which these reserves can be produced with or without physical waste. Oil cannot be produced from the permeable rocks in which it occurs at any desired rate, because the flow of oil through the pores of the oil-bearing rocks is definitely controlled by the physical factors of the reservoir. As a matter of fact, today's known oil can be recovered only over a period of many years and at gradually declining annual rates. This has been widely demonstrated by past performance under all kinds of operating conditions. Therefore, only incorrect conclusions as to the life of these reserves can be obtained by dividing these reserves by the current rate of production."

The following is excerpted from the statements of the Committee on Natural Gas Reserves:

"The procedure followed in estimating and assembling the proved reserve figures were the same as those used in past reports. Proved reserves may be in either the drilled or undrilled portion of a given field. Where the undrilled areas are considered proved, they are so related to the developed acreage and to the known field geology and structure that their productive ability is considered assured. Proved recoverable reserves of natural gas are the reserves estimated to be producible under present operating practices. Since the estimates are made by fields, the recovery factors or abandonment pressures used in the calculations were governed by the operating conditions in each individual field. Proved recoverable reserves of natural gas liquids are those contained in recoverable gas reserves."

It may not be amiss to point out again that Oklahoma holds an enviable position with respect to reserves of mineral fuels. It has been said before, and cannot be repeated too often, that Oklahoma has an abundance of all three. That is, we have ample reserves of crude oil, natural gas, and coal--the dominant sources of fuel and power.

With an estimated 55,000,000,000 tons of coal reserves and located in the heart of the major oil and gas producing region of the United States, Oklahoma offers industry the highest possible insurance of energy for fuel and power over a long period of time.

The following table is compiled from the various tables contained in the report, and gives the estimates dealing with Oklahoma:

Estimated reserves of crude oil, natural gas liquids, and natural gas in Oklahoma

	Crude oil	Natural Gas* Liquids	Natural Gas
	barrels	barrels	thous. of cu.ft.
Proved reserves as of December 31, 1949	1,329,918,000	234,030,000	11,625,979,000
Changes in proved reserves due to extensions and re- visions	193,331,000	61,897,000	486,813,000
Proved reserves discovered in new fields and in new pools in old fields	37,531,000	4,922,000	121,163,000
Production, 1950	163,867,000	20,946,000	607,918,000
Proved reserves as of December 31, 1950	1,396,913,000	279,903,000	11,634,287,000
Net increase of reserves, December 31, 1950, over December 31, 1949	66,995,000	45,873,000	8,308,000

* includes condensate, natural gasoline, and liquified petroleum gases.