

THE GAS INDUSTRY PRESENT AND FUTURE *

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THE story of man's progress since creation of the universe has been the story of the search for energy and its efficient utilization. Energy comes in many forms, some only dimly perceived by man at present. We are just beginning to hear about nuclear energy, plasmas and other cosmic forces which will attract much of our attention in the future.

Although gas traces its history back to the 19th century and next year will celebrate its sesquicentennial marking 150 years of service to the country, the industry has undergone revolutionary changes in the last 20 years — changes which have produced a vital exciting industry so different from what it was in the past that it can truly be called new. Gas today is meeting and even anticipating the challenge of space and has stepped with full force into a super-demanding world to become the nation's 6th largest industry.

About 1930 the dynamic natural gas industry known today was born with the development of strong, light, steel pipe capable of withstanding great pressure for the transportation of gas over considerable distances. Construction of long-distance pipelines started in the mountain states, moved both east and west, was delayed for a time by World War II, but finally reached the northeast in 1952. Now for the first time a form of natural energy could be delivered directly to consumers without the inefficient conversions of energy previously required. In addition, it was clean, convenient, available on demand, sensitive to precise control, required no handling or storage, left neither smoke nor ash, developed maximum heating capacity instantly, and cost less than manufactured gas. No wonder that gas consumption in the United States has increased seven-fold in the last three decades while total consumption of energy has doubled.

Let me review with you the events of the early 1950's which led to the arrival of natural gas in New England. About the turn of the decade two corporations were formed, each seeking to build a natural gas pipeline to serve the concentrations of population in New England. These two companies were Algonquin Gas Transmission Company and Northeastern Gas Transmission Company, a wholly owned subsidiary of Tennessee Gas Transmission Company, later merged into the parent. The New England market was divided between the two pipelines. Many thought the decision

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to split the market a political rather than an economic decision. The price tag for additional assurance of supply with two pipeline systems was an increase of 20 to 30 per cent in the wholesale cost of gas at the time of an extremely competitive retail "battle of the fuels." Neither Maine nor Vermont have received the benefits of natural gas, so most of the facts I shall relate about New England include only the states of Connecticut, Massachusetts, New Hampshire and Rhode Island. When natural gas arrived these four states had only 117,000 gas heating customers. This number has increased $4\frac{1}{4}$ times to approximately one half a million. Because of a relatively low heating saturation in New England ten years ago, this rate of adding heating customers is more than twice the rate at which gas heating customers are being added in other sections of the United States where more than 90 per cent of the gas utilities' customers heat with gas.

Ten years ago the two pipelines in New England delivered 590 million therms of energy to their customers and by last year deliveries had multiplied 2.73 times to 1,619 million therms. In 1954 residential customers in Connecticut and Massachusetts paid 25 cents per therm. As a result of the large increase in use of gas for residential heating, the average residential rate had decreased by 20% to just under 20 cents per therm last year.

I have related these possibly boring statistics to lay the foundation for a calculation of the benefits of natural gas to the nearly $1\frac{1}{2}$ million residential customers in New England. In the last decade these customers have saved nearly a quarter of a billion dollars — 245 million to be exact — in the purchase of natural gas at the declining prices year by year compared with the rates which applied in 1954. Since 1960 New England has been free of increases in pipeline rates for gas purchased and, in fact, the pipelines have made several reductions since that time reflecting to a large extent lower or stabilized well-head prices. This would seem to indicate the start of a period of price and cost stability in the 1960's not heretofore enjoyed since the advent of natural gas.

A friend of mine, who is a compulsive worrier, asked me if I didn't think that this country is running out of things to run out of. I told him I didn't think so because the things we're always supposed to be running out of haven't run out yet, including natural gas. To allay anyone's concern about this item, I would like to point out that at the end of 1964 proved recoverable reserves of natural gas in the United States reached almost 300 million trillion cubic feet, enough to last for 20 years at present estimated annual usage rates without any new discoveries. Ultimate recoverable natural gas reserves are estimated by gas industry scientists at well over 1,000 trillion cubic feet. These reserves are indicated by the improving technology for exploiting oil fields, the yet unrealized potential

of the offshore areas, and the still scarcely touched sedimentary basins of much of central North America, from Mexico to the Arctic.

Now that regulatory problems are being resolved, the gas industry's growth potential is coming into clearer focus. The industry now can look forward to a stable cost of gas, adequate supplies, lower pipeline costs, improved labor utilization, and vigorous promotion to meet a more mature and competitive market.

We are finding new applications for spurring the use of gas each day. New equipment is being developed that can compete with the electric power industry and oil industries as well. Strong research and promotional efforts are being pooled to prove the economic potential of gas in the market place. The most significant current example of this can be seen at the industry's exhibit at the New York World's Fair. At the 1939 Fair, gas heating was inaugurated. At the current Fair, gas air conditioning is being similarly launched. Gas won over electricity for 80% of the current Fair's air conditioning load, 90% of the space heating and water heating, and 99% of the cooking load.

I cannot help but mention one of the greatest contributions that has been made to the progress of the new, modern gas industry in the United States. Thanks to the leadership of a dedicated group of citizens, including officers and directors of our company, Constitution Plaza in Greater Hartford came to reality, and with it The Hartford Steam Company, subsidiary of Hartford Gas, serving chilled water and steam for heating and hot water to many buildings through an underground system of insulated pipes in downtown Hartford, thus carrying the conversion of natural energy one step further. The economics of large-size equipment, diversity and space saving now benefit these downtown customers.

Our steam and chilled water plant which started out as a \$4,000,000 project will, in the summer of 1965 — in just three short years — have doubled in size and equipment, with plans in the future to serve additional customers including the new Hartford National Bank building and the newest redevelopment project — Bushnell Plaza. Our primary business is the sale of gas and we face a peak during the winter months which is much higher than the minimum day during the summer months. We, therefore, have the problem of smoothing out the 12-month curve by increasing the sendout in the summer. The idea of using gas under boilers to generate cooling and heating service from a central plant was one step to the solution of this problem plus having the added benefit of giving impetus to the company's sale of gas-fired heating and air conditioning equipment to existing new domestic and commercial customers.

Natural gas is the most convenient, efficient and economical source of heat energy; it is the cleanest fuel, and there is an adequate supply for all purposes now foreseen. Because gas is ideal for home heating, its residential market has been and will continue to be the industry's basic load. To increase this summer load, the industry is engaged in an all-out effort to sell gas air conditioning. While gas has dominated the residential heating market, electricity has dominated the air conditioning market. Now, total whole-house comfort conditioning with control of humidity and temperature is available with natural gas the source of energy. Lack of moving parts promises ease of maintenance and low summer gas air conditioning rates make most attractive the cost of operation.

Recently, a new dimension has been added to storage technology. It is the LNG or Liquid Natural Gas Plant which freezes natural gas (methane) to 260 degrees Fahrenheit and stores it under pressure at 1/600th of its normal volume. This new storage facility can be a highly engineered pressure tank above ground, or an "inground" pit making use of natural rock formation at ground level. LNG plants will make storage possible in such areas as New England where there are no natural underground reservoirs.

Of the basic fossil fuels, gas, being the only one that is virtually 100 per cent combustible, is the best for fuel needs in the great urban areas bothered with air pollution. The most significant example of this is in Los Angeles, where climate conditions and air pollution result in dangerous smog. No longer is permitted the use of any fuel other than the highest grade of fuel oil and natural gas. The chief cause of air pollution from fuel combustion is the sulphur content of the fuel. Natural gas is the only fossil fuel with a negligible amount of sulphur. Regional attacks on this problem are getting underway in many urban areas. This will create new opportunities for gas including gas-fired incineration.

One of the features of the World's Fair "Festival of Gas" are the newest models of gas ranges. To improve its competitive position in the domestic cooking market, the gas industry has introduced the infra-red burner which offers the advantage of greater cooking speed and directed heat rays. Since there is no heat diffusion, the kitchen remains cool. Improved controls are being added to gas water heaters, dishwashers and clothes dryers and clothes washer-dryer combinations. So-called "kitchen walls" will combine range, refrigerator-freezer and other large utility appliances in a single unit. A gas clothes dryer with a lint incinerator, under glass burners, improved smokeless-odorless gas disposers for trash and garbage, plastic dish-makers are here or will be here within a short time.

Natural gas, the work horse of the home, is also moving outdoors. The rebirth of the soft glow of the gaslight is being noticed more and more with more gaslights in service today than in the 1890's. Gas outdoor grills with the infra-red burner will make your rotissing or barbecuing easy without the fuss and bother of starting a charcoal fire. Gas infra-red heaters on the patio will enable you to lengthen the outdoor season or to eat your Christmas dinner outdoors in comfort if you so desire.

One of the most promising developments for long-term growth in the commercial and industrial field, is the concept of total energy from gas. In this type of power package, natural gas supplies the energy for electricity or other mechanical drive from a gas-fueled engine or turbine, while normally-heated wasted engine exhaust heat is recovered for heating and cooling buildings or for industrial processing.

Can natural gas make electricity without the use of a conventional generator? Yes, it is possible although this method is still experimental. In this process, natural gas passes into a fuel cell system where the air and gas re-act to produce electricity. The fuel cell is somewhat like an ordinary storage battery but, unlike the battery which must be recharged, this fascinating device continues to produce electricity as long as gas and air are supplied.

This, then, is the gas industry — a vital, growing part of the American economy and full of potential. A modern industry whose aim is to serve the nation better.