

## NATURAL GAS IN THE FUTURE \*

By Edward F. Kulas, *Commercial & Industrial Supervisor, Hartford Gas Co.*

THE natural gas industry is in the space age. The emphasis placed upon sending rockets to the moon has precipitated interest in developing compact, highly efficient means of producing electric energy. At the present time, there are over 50 large industries in the United States which are expected to spend approximately \$60 million in research in this field alone. Currently, there are four devices being explored to convert gas energy directly into electric — without moving parts:

1. *The Thermoelectric Generator* — by heating the juncture of dissimilar material, electric energy is produced. There are many applications of the Thermoelectric Generator, such as: gasoline powered radios, gas safety pilot equipment, and many others are promised for the near future.
2. *The Thermionic Generator* — this device is similar to a vacuum tube containing two plates. The tube is heated from one side, oxidizing the gas, and producing a flow of electricity. Generators are being developed to strap the exhaust portion of the rockets and produce electricity for the guidance system of the rocket.
3. *The Magnetohydrodynamic Converter* — has the advantage of producing megawatts of electricity from relatively small equipment. At the present time, there is much research and development needed before actual use can be made of this equipment.
4. *The Fuel Cell* is a super-efficient storage battery which utilizes the direct conversion of natural gas into electric energy. Natural gas is fed into the anode and air is supplied into the cathode. Two electro-chemical reactions take place simultaneously — converting natural gas energy directly into electricity.

The possible applications of the fuel cell are astounding. The gas industry foresees for the near future a unit no larger than a suitcase, supplied with natural gas, producing all of the energy required for the home-heating, air conditioning, electricity, etc. No moving parts, long life, low maintenance, silence of operation, and complete dependability are the main advantages of this type of system.

---

\* Presented at the 81st Annual Meeting of The Connecticut Society of Civil Engineers, Inc., Cheshire, Conn., April 22, 1965.

The fuel cell is in the future but there are many installations in the country today taking advantage of on-site power generation. These installations are called "Total Energy" applications in that all of the energy required for a shopping center, industrial plant, etc., is supplied from a natural gas engine or turbine. Natural gas fired reciprocating engines or turbines are used to produce electricity directly. The heat of the engines is utilized for heating and cooling needs — thus, increasing the over-all efficiency. There are, at the present time, 200 jobs in this country alone utilizing the "Total Energy" concept. Dependable power and economical operation are the main reasons for their increased popularity. The gas industry foresees a tremendous increase in the use of natural gas for on-site power generation and increased technology of producing electricity from natural gas.