

The World's Most Advanced Method of Making Town Gas

Hitchin: Eastern Gas Board 1963-74

Cadwell Lane :Hitchin, Herts, England

The set of three different methods of producing Town Gas, at high pressure, enabled gas to be sent down from Hitchin to Tottenham in North London, and up to Kings Lynn and Norwich, in East Anglia, made the site the most advanced gasworks in the world. **See Figures.**

All the processes used a variant of “steam reforming” where steam was reacted with a hydrocarbon at high pressure and at a temperature of around 750°C, to produce a gas containing hydrogen, methane and carbon monoxide.

After cooling the gas to about 400°C, the gas was further modified to get rid of most of the carbon monoxide, which is highly toxic, replacing this with more hydrogen.

The great advantage of steam reforming was that it was extremely clean and, being automated, like a modern chemical plant, needed the minimum of manpower. An old fashioned gasworks, would have needed about 1000 men with a few women in admin and catering. Hitchin managed with about 50, with seven people on each shift actually running the three plants.

Fuel costs were lower than coal. The plants could be built in just over a year. And they were highly efficient turning over 90% of the energy in the “feedstock” into gas. The cost of gas making was more than halved, when using British Gases' own breakthrough, the CRG process. The introduction of steam reforming, used in every other Gas Board in Great Britain and Northern Ireland, saved the Gas Industry, which was on a downhill slope.

Three Different Processes

All the processes, incorporating steam reforming furnaces, used a catalyst held in cast stainless steel tubes, that were held and heated within the furnaces.

Otto Peak Load Reformer

This was different to all the other processes, in using butane, a gaseous hydrocarbon, as feedstock. Although expensive to run, because of the cost of butane, the plant could be started up from cold in a few hours. The furnace in this case was cylindrical in shape, the tubes lining the inside wall, heated by a single central burner

ICI Reformers

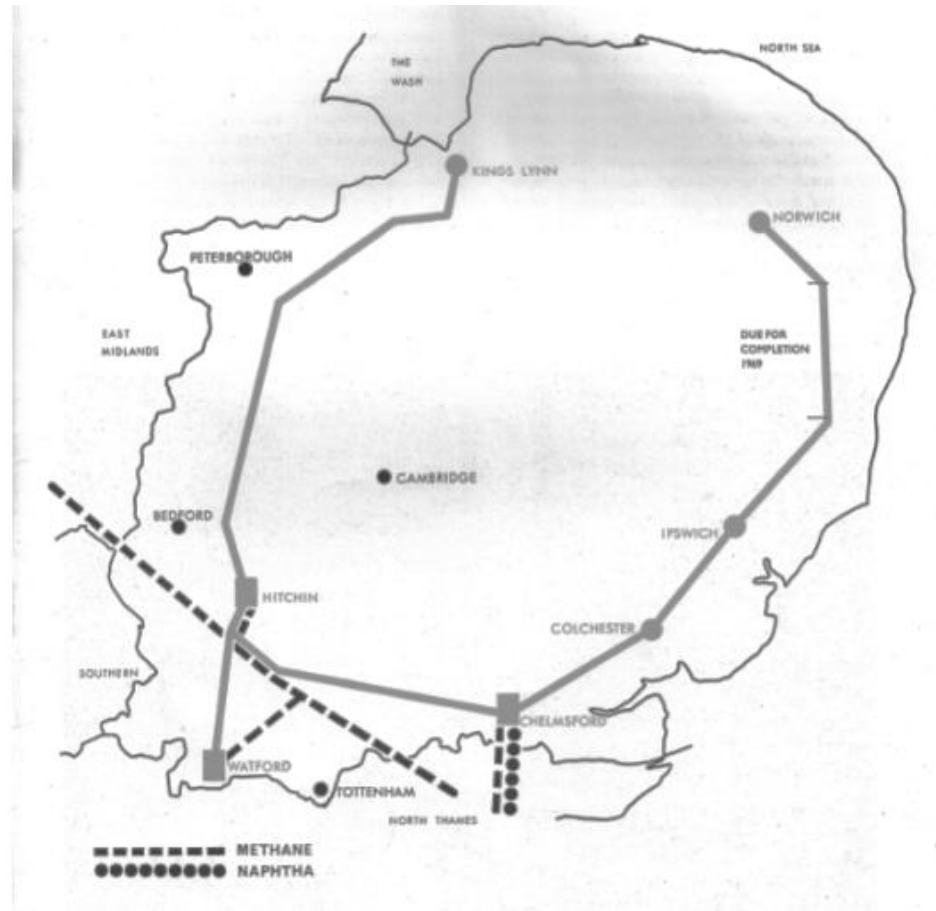
There were four furnaces about 30 metres long, 10 metres wide and about 20 metres high. Four rows of tubing ran along the length of the furnace, the heat coming from downward firing burners in the roof.

This type of reformer had been conceived by ICI Billingham, on Teesside, hence the name, who had developed a catalyst that could work with naphtha. This is essentially a low grade petrol, unsuitable for modern motor vehicles. ICI used the process to make hydrogen, but for Town Gas, the calorific value was too low. Expensive butane had to be added to the gas leaving the site. Note the butane storage tanks.

CRG Process and Reformers

British Gas's Midlands Research Station overcame this drawback by inventing the Catalytic Rich Gas (CRG) process which worked alongside the ICI reformers. The CRG produced a gas containing more methane and less hydrogen, enabling the plant to dispense with the butane addition. The CRG and related British Gas processes have been sold all over the world. I worked on this plant for a short time

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Eastern Gas, one of the British Gas “Area Boards” supplied town gas to the whole of East Anglia and parts of North London. It had three sites operating steam reformers, Hitchin, Watford and Chelmsford. Towns like Bedford and Cambridge would have been operating old fashioned gas works. The same was true of places like Colchester and Kings Lynn, but these were connected into the medium pressure pipeline running at about 250 psi, getting gas from the reformers

The dashed line shows pipelines carrying methane at 70 bar pressure from Canvey Methane Terminal. This could be used instead of naphtha as a feedstock for steam reforming. However, because of the expense this was rarely, if ever done. The dotted line shows naphtha from refineries on the Thames being sent by pipeline to Chelmsford.



Rail Siding
for
Unloading Trains
Carrying Naphtha

Naphtha Tanks

Naphtha Tank

Compressor
Building

Butane Storage
Spheres

Admin Offices

Otto Reformer

ICI Reformers (4)

Diesel Generator Building

CRG Reformers (2)

East Coast Mainline

