This is not the first energy transition in living memory: the story of the change from town gas to natural gas

Introduction

The transition from fossil fuels, such as natural gas and oil, to renewables, such as wind and solar energy, is a crucial step to achieve net zero emissions of greenhouse gases. 40% of Manx emissions are related to the heating of buildings and, therefore, in the future we will no longer be using oil- and gas-fired boilers in our central heating systems. Options to replace these include using electricity from renewable energy schemes or using hydrogen from electrolysers, again powered by renewable energy. In both cases, new boilers will be needed and, in the case of hydrogen, a new gas distribution system. Whilst this may sound daunting, this is not the first time a major transition from one form of heating (and cooking) has occurred. The entire British Isles changed from town gas to natural gas - starting in the late 1960's in the UK, finishing in the early 2000s on the Isle of Man. This transition went remarkably smoothly with a rolling program where whole cities were converted in less than a week.

Background

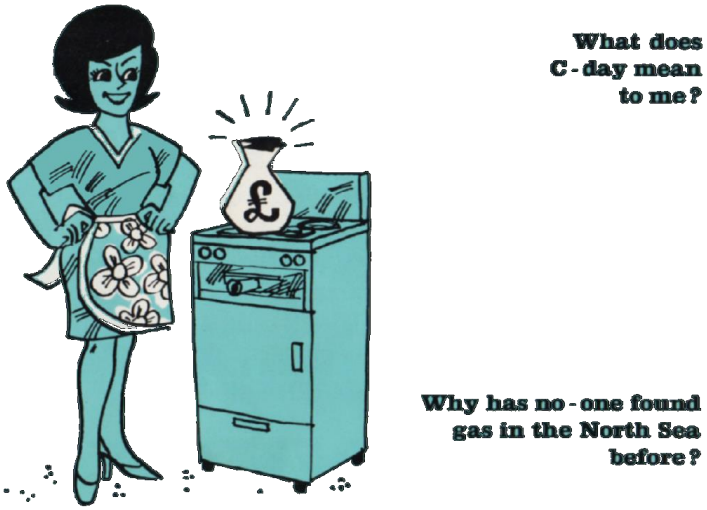
Town gas (or coal gas) is composed primarily of hydrogen and carbon monoxide and is produced by heating coal in the presence of oxygen and steam. Town gas was first produced by William Murdoch in 1792 who used it to light an entire house. With the UK being a major coal producer through most of the 20th century, town gas was developed on a large scale for cooking, heating and industrial uses, despite disadvantages like the fact that carbon monoxide is poisonous and that the production process is polluting.

The demise of the town gas industry came with the discovery of natural gas (methane) in the UK-part of the North Sea in 1965. The first gas was brought onshore in 1967 and thereafter began a 10-year process to convert town gas to natural gas, a much cheaper and cleaner resource, with superior heating properties. Gas-fired power stations also became favoured over coal-fired plants as they are inherently more efficient and produce virtually no smoke.

What did the conversion entail?

Any domestic appliance fuelled by town gas such as cookers and boilers had to be either converted to natural gas or replaced, the latter case for those typically over 15 years old. The conversion of the newer appliances was of varying complexity, some needing replacement dampers, aeration sleeves, air baffles and gas jets. At the same time, a new pipeline infrastructure was built across the UK, not only to bring the gas to shore and to process it but also to distribute it around the country.

Much later, in 2003, a natural gas pipeline was built to the Isle of Man, connected with one transporting gas from Scotland to Ireland. Prior to that most gas was brought to the Island by ship as LPG (liquefied petroleum gas).



UK Conversion Scheme

Approximately 40 million domestic appliances were converted for 14 million customers between 1967-1977. The UK Government organised nationwide advertising campaigns on TV, radio and newspapers. Thousands of new gas fitters were trained and sent to every household before the conversion day so that replacement parts could be ordered in advance or, if the cooker or boiler was too old to upgrade, a new appliance was offered. British Gas ran showrooms in every town and city to deal with queries and sell the appropriate equipment. The incentive was that natural gas would be cheaper. Nonetheless, rental and hire purchase agreements were offered for customers who could not buy outright.

The projects were organised into discrete sectors with the (town) gas turned off for several days whilst the work was carried out before the new (natural) gas supply was turned on. Some towns in regions like Cornwall had a temporary supply of natural gas brought in by road until all areas in the sector had been converted. Only after everywhere was ready could the gas main be turned on.

Cambridge was the first town to be converted, supposedly due to having a high number of suicides carried out using poisonous town gas.

The number of appliances that were converted peaked in 1971/72 with 2.3 million appliances converted or replaced in 12 months. The project ended in 1977 having cost £600 million (equivalent to £2.9 billion in money of today) and was clearly a successful project.

Natural gas on the Isle of Man

The last town gas produced on the Isle of Man was in 1971, with liquefied petroleum gas (LPG) taking its place. LPG was supplied via the existing town gas networks but was blended with air to lower its calorific value close to that of town gas. LPG was phased out in two stages, initially in 2002/2003 around the Douglas region, when the new pipeline was opened, and then in 2010-2012 when the rest of the Island was connected to the network.

2002-2003 Project

Manx Gas and Primeshade engineers converted approximately 15,000 LPG customers in Douglas and Onchan from LPG to natural gas in the first stage. This was a complex process which included dividing up the new distribution system, surveying all appliances, making sure parts were ready at the correct time and switching on the supply of natural gas on the conversion day. The project received some criticism about the difficulty of contacting those in charge and the fact that certain customers were left without gas fires and cookers for weeks.

2010-2012 Project

In 2010, Tynwald voted to spend £23.5 million on pipelines to provide natural gas to all areas of the Island. A new 19km long pipeline was completed in 2011 to supply 6,800 properties in Ramsey, Kirk Michael and Ballaugh. This was the start of a 2-year conversion project for the rest of the Island. The work was carried out by Gas Safe registered engineers. Sectors comprising 75-100 properties, both homes and businesses, were converted at the same time, following a pre-conversion survey to identify issues. Each customer received a minimum 1 month notice of when the conversion would take place, plus reminders leading up to conversion day.

Following feedback from the 2002-2003 project, a blue bus - the Manx Gas mobile support unit - was used as a drop-in centre for the public who wanted to find out more about the process. It also offered a secure key-holding service for customers who were away from their property during the conversion process, whilst allowing engineers to carry out work with minimum disturbance. The entire project was completed successfully by December 2012, coming in under budget at £19.5 million (£22.6 million in money of today).

Conclusion

There is concern about the cost and technical feasibility of large infrastructure projects associated with the energy transition. However, history shows us that, if society is to progress, change is inevitable and it can occur relatively smoothly when it is properly planned.

Prior to the 1970's, the gas used in homes was a mix of hydrogen and carbon monoxide so it is interesting to note that one of the future options for emissions-free fuel is hydrogen, albeit produced from electrolysis using green energy rather than coal.

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