

## CO-GENERATION IN JAPAN (Based on a study done in Tokyo)

By Imtiaz Issadeen

The increase of small household Cogeneration systems in Japan is largely attributed to the availability of very reasonably priced self contained equipment that is being marketed by Gas companies.

In gas cogeneration, city gas is used to power engines, turbines and fuel cells to generate electricity, and the resulting thermal energy used to produce steam and hot water. Gas cogeneration systems are used for a variety of purposes, including in factories, supplying hot water and steam in hotels and hospitals, heating and air conditioning of buildings, and heated swimming pools.

Gas cogeneration systems reach a total energy efficiency up to 70% ~ 80%. It is also attracting attention as a clean, environmentally friendly gas cogeneration systems that can be tailored to meet specific customer needs.

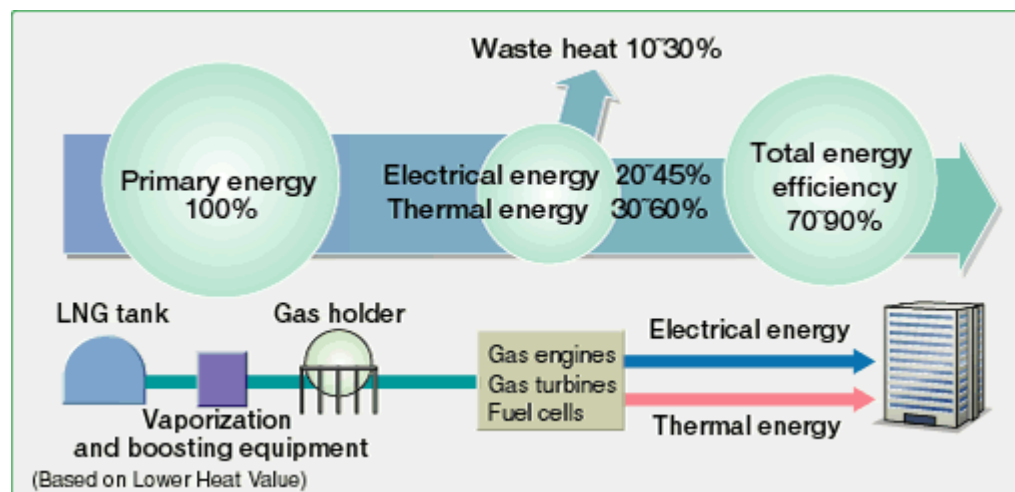


Image from Tokyo Gas site

However with all LNG supplied and sold in Japan being imported from overseas sources, with regular cost increases seen over the past several years. Yet the guarantee of supply continuity is not assured and can be adversely impacted on by several external factors.

Shipped LNG supplies can stop during a conflict, calamity, strike or fire. Thus making this a source heavily reliant on external factors.

Gas utilities are taking active anti-earthquake measures by introducing earthquake-proof gas facilities and automated gas shut-off systems.

Methods for cutting off gas supplies include shutting down the governor within the target block, shutting off valves installed in medium-pressure conduits, and stopping gas delivery at gas plants or gas tanks.

Some gas providers have set up shutoff systems capable of immediate shutoff by means of block-by-block remote shutoff or automatic seismosensitive shutoff systems.

Seismographs have been installed and used as benchmarks for shutting off

gas supplies in times of an earthquake.

Here too Japan is at risk due to the high seismic activity that takes place in Japan at frequent intervals.

Thus having a system in place by which gas supplies are cut off without delay if the level measured with a seismograph exceeds the given limit is essential.

#### **NEGATIVE ASPECTS of COGENERATION**

1. Fuel costs is constantly rising globally
2. Japan relies 100% on imported LNG (Australia and Russia).
3. Exchange rates impact on the cost of LNG
4. Electricity from the grid has on the other hand come down in price and would be around 25 to 40% cheaper than co-generated power.  
*(Further cost studies are recommended if more accurate information is needed).*
5. Tokyo Electric Company (TEPCO) will purchase excess power but at their wholesale purchase price which could be about 30% of the cost incurred in producing the electricity using cogeneration.
6. Noise from the generators could impact on homes nearby.
7. Even if heat is recovered using thermal transfer systems, the final exhausts will flow towards the homes with any Southerly wind.
8. Obtaining permits from the City Engineers for co-generation may be a very difficult exercise.
9. Cost of infrastructure for Co-generation, cost of periodic equipment service and other capital expenditure could be colossal.