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**Biogas: the way forward**

The biogas initiative was launched in Pakistan as early as the 1980s. In the meantime, almost nothing of significance has happened; a few thousand family sized biogas units have been installed, thanks to the RSPN and others’ action or lack of it.

By comparison, India has installed 4 million units and China six million household units. This translates to one biogas unit per every 10 households and one out of every 10 households in India.

We need biogas, especially, in our rural areas. Pipeline gas provides gas only to 20 percent of the population, while 80 percent remain and will remain unserved. Our rural areas will remain without gas, despite great potential, if a reasonable initiative is not launched.

Although biogas was initially conceived for households, nowadays it is a significant industrial solution. Today, large plants costing $20 million are being installed. Germany has 5000 of such units injecting gas into gas networks and producing electricity. In Norway, Sweden and Denmark, Bio-CNG has been fuelling buses for more than a decade now.

To give the readers an idea of biogas potential, only Karachi has equivalent of two gas fields of 30 mmcfd each – one in the Landhi cattle colony and one in solid waste dump. Landhi has 400,000 cattle; the area pollutes both land and sea and spreads disease as well. Municipal Solid Waste (MSW) has been a liability as well – 16,000 tons per day of MSW, containing 50 percent wet food waste. Converting it to biogas may be able to finance the MSW project costs, if not in full then significantly. A Landhi cattle colony biogas-to-electricity project has been talked about for about two decades now. The project has now been changed to fuelling green buses by converting biogas to bio-CNG. Will it happen this time?

There is also talk of generating electricity out of senselessly burning solid waste to produce electricity in Karachi. The threat and risk is air pollution caused by burning solid waste. Poor countries like Pakistan have more wet waste than dry waste culminating into a low heat content. An alternative solution could have been to produce biogas and inject it into the grid (after cleaning and upgrading) or/and fuel public transport buses and even private transport. Incineration is old fashioned and risky. Besides, MSW burnt electricity is expensive 10 USc per kWh as opposed to solar of 4 USc per unit.

Interestingly, cow dung has traditionally been considered as the only traditional source of biogas. No more; today, biogas can be produced from all kinds of waste: crop waste, animal slaughter, poultry, food and vegetable waste and agro-industrial waste etc. Rice stubble is a menace which is burnt in the winter, on both sides of the border, practically shutting down Lahore, Haryana and Delhi. India has gone ahead with a project producing biogas out of rice stubble; the biogas produced will be injected into the nearby gas grid and supply gas to the adjoining areas. There is no move yet in this respect in Pakistan, although SMEs are having to close their businesses in the winter. That’s an easy task if not a complete solution. Can SNGPL rise to the occasion?

Biogas is somewhat more expensive; it costs anywhere between locally produced natural gas and the more expensive LNG. Many CNG stations are being given gas on LNG rates. In India, bio-CNG is cheaper than normal CNG. Both dung and crop wastes are free, costing collection cost only.

Biogas costs in the two countries may not cost very differently. A bio-CNG plant in India costs $1 million or so in CAPEX but practically very little fuel or operating cost. In India, bio-CNG rates are IRs35 vs IRs42 per kg for conventional CNG. They plan to install 5000 bio-CNG plants in the near future. They have already started doing that and many such CNG pumps are already in operation.

Pakistan has a large sugar industry producing expensive sugar. Being water intensive, whether it should have been there at all is a controversial question. There are some 94 sugar plants, spread throughout Pakistan in Punjab, Sindh and Khyber Pakhtunkhwa. The sugar industry is a great pollutant, producing raw and dirty effluent and press mud-a solid waste. Despite EPA laws to the contrary, they divert their effluents into the water channel or divert it to agricultural land, purportedly providing fertilizer like material to the lands.

Only if environmental laws are applied, and effluents from sugar plants can be passed in digesters (anaerobic), a lot of biogas can be produced. In fact, effluent and press-mud mixed have very high biogas generation potential – three times higher than gobar. Untreated biogas can be supplied to the adjoining areas at reasonable costs or/and bio-CNG plants can be installed at or nearby sugar plants. One sugar plant can feed at least 10 CNG pumps. Ninety-four sugar plants can provide biogas to 10 nearby NG pumps. Make money and solve the problem as well?

Put together, there is a potential of 1100 mmcfd of biogas, compared to the 4000 mmcfd of local fossil gas production. And this is renewable; as long as there is life and bio-activity on earth, this level of biogas and even more would be there. Fossil gas will go away; already our gas resources are dwindling and are projected to be exhausted in almost ten years, causing shortages in the meantime, as is the case already. It is not a fairytale; it is already happening in the region and has happened in Europe and the US.

We have some 50 million cows and buffalos in Pakistan. There are 2 million households that have 4-5 cattle each. Practically, all of them should be able to install biogas plants; one million should be targeted for the next five years. There are more than 20,000 households which have 50 or more cattle. Community scale biogas plants can be installed without the need for biogas cleaning or upgrading. Local isolated gas distribution networks can be installed, using 2-3 inch plastic pipe. People and communities can do it themselves, if the legal framework and bank financing is available. A good-sized community biogas plant with network may not cost more than Rs5 million. It is peanuts compared to the cost of LPG Air Mix Plants.

There is one problem, however, in biogas. It contains 65-70 percent methane only, well enough for firing hearths at home or industry. It remains a stranded resource, unless it is cleaned up, removing CO2 and sulfur; then it can be injected into the gas grid or used as CNG or for producing electricity. Significant investment is required to do this; 1 mmcfd plants may cost as much as $20 million. Biogas-based electricity is facing competition from the much cheaper solar, which is much more widely and conveniently used (however, only in the day). As a gas, it may cost anywhere between normal gas and LNG.

What is the way forward; both gas companies. SNGPL and the SSGC may be tasked to install a few biogas-bio-CNG pilot plants. They may eventually find it so good that they may like to block the entry of others. Local communities and governments may be involved for smaller isolated gas grids. Bank and government credit and finance may be arranged by the federal and provincial governments.

Biogas has the potential to initiate a cycle of economic activity without foreign investments. It will mobilize local investors and communities and create employment along with cleaning the environment. One does not see an equivalent competitor to this concept. Biogas should not be rejected or neglected among the list of national priorities.

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