

Ways to increase energy efficiency

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Improving the efficiencies of old power plants can save a large quantity of natural gas every year, and thus make the task of supplying fuels to meet the 2021 power generation target much easier. The average efficiency of power plants in Bangladesh can easily be enhanced by 5 percent by 2021.

The increases in the prices of grid electricity and gas for captive generation coupled with the shortage of gas supply have made industrialists aware of the need to conserve energy and achieve greater EE. A recent JICA study has found that the Energy Intensity (EI) of the economy measured as primary energy consumed divided by GDP has recorded a 33 percent decrease as can be seen from Figure 2.

This clearly indicates increases in EE. However, unfortunately, it also indicates that the growth in the economy is occurring in only non-energy intensive industries such as garments. If this trend continues, it is highly unlikely that Bangladesh will reach its declared

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power generation goal in 2021. An analysis of historical EI (kgoe/1000 USD) of several countries has found that during fast economic growth period of most countries, the EI increases before reaching a plateau. As the country begins to achieve developed country status, the EI starts to fall and the economy shifts from manufacturing and production to services.

The fall in EI resulting from EE improvements is certainly a good thing even though in Bangladesh it is the result of shortage of gas supply to industries. In recent years two major things in terms of improving EE has been taking place in Bangladesh. One is the use of efficient boilers and the other is the practice of cogeneration. An audit of several industries found that many industries now have boilers that are more than 80 percent efficient. A study conducted by Titas Gas Distribution

Company five years back had found boiler efficiencies as low as 65 percent, with the average around 70 percent. The scope of boiler efficiency improvement still exists because the average efficiency, which is now around 75 percent, can easily be increased beyond 80 percent. Since boilers consume more than 50 percent of all the gas going to industries (not including gas for captive generation), concentrating on boilers is a very prudent approach. Combustion control and increased insulation are the two simple measures that can be applied to most boilers. For large sized boilers adding condensate recovery and return can greatly enhance efficiency. A concerted effort undertaken by SREDA in conjunction with TITAS and Bakhrahad Gas Companies can greatly improve the situation.

Cogeneration is the other option that can be widely promoted.

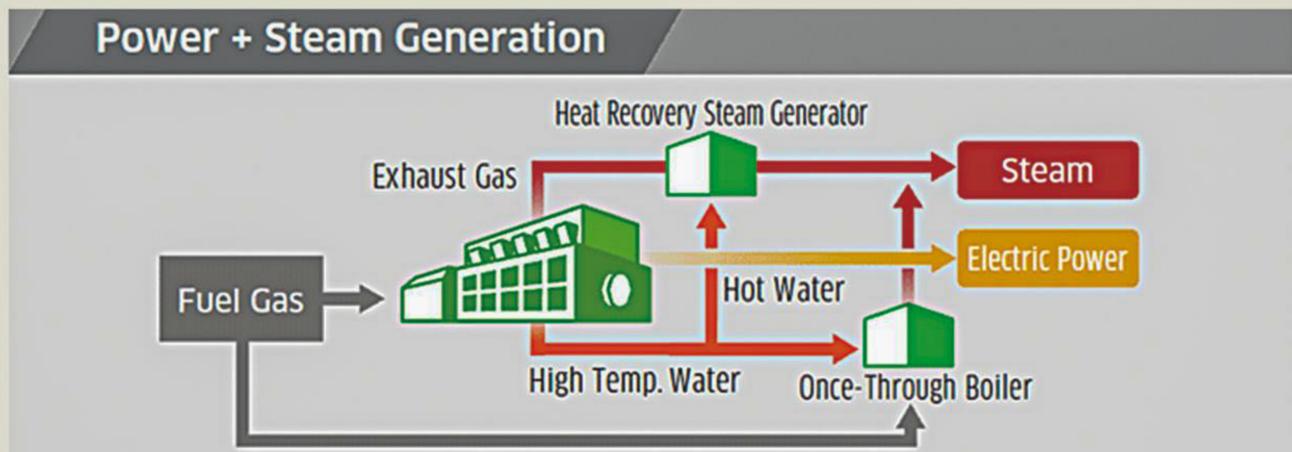
Cogeneration, as the name implies, is the simultaneous production of heat and power (see Figure 3). Bangladesh is unique in having a large quantity of captive power generation. This is extremely rare because in most countries industries are compelled to buy power from the grid. The shortage of electricity and highly unreliable supply in the mid-nineties forced the government to allow captive power generation. The low price of gas and tax-free import of gas generators fuelled the growth of this sector. Today more than 2000 MW exists as captive power in industries. The government is failing to reverse this decision because it is not able to supply reliable electricity.

The generation of power in situ affords a great opportunity to practice cogeneration. At present more than 80 percent of the captive generators are venting their flue-gas directly to the

atmosphere. If 35 percent of the heat is assumed to be converted to electricity, then 65 percent is wasted. A technique known as waste-heat recovery allows this wasted heat to be put to good use. As much as half of the wasted heat can be recovered in the form of steam, which can be put to various uses such as process heat or cooling through the use of an absorption chiller. In effect waste heat is free energy. Cogeneration can save a lot of gas presently used in these industries for boilers and chillers. The severe shortage of gas has compelled many on their own initiative to practice cogeneration. More than 200 waste heat boilers and another 200 absorption chillers have already been set up. Potential to set up at least similar number of cogeneration projects still remains.

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FIGURE 3: COGENERATION (SIMULTANEOUS PRODUCTION OF HEAT AND POWER)



SOURCE: KAWASAKI ([HTTPS://GLOBAL.KAWASAKI.COM/EN/ENERGY/SOLUTIONS/DISTRIBUTED_POWER/](https://global.kawasaki.com/en/energy/solutions/distributed_power/))

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