

## CHP/Co-gen Plant The silent revolution, on way in Electricity Market



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### About the Author

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The very mention of a power plant immediately brings to mind gargantuan plants belching out massive amounts of smoke from their bellies. And great stretches of land littered with transmission towers and cables taking the electricity generated to end-users.

All this may soon become a relic of the past. There is a silent revolution going on behind the scenes of utility industry deregulation. This idea that is being worked on is generating power where it is needed most.

Large power users are quietly evaluating various options in a rapidly changing marketplace and discovering that on-site power generation - especially co-generation or CHP is an efficient, effective and economical means of cutting costs and ensuring high quality power and heat production while reducing dependence on traditional power suppliers.

Traditionally, large fossil-fuel burning power generating plants produce, along with the electricity, a lot of valuable heat energy that is dissipated into the atmosphere. Thermal plants also generate large volumes of poisonous exhausts that contain particulates of carbon dioxide and sulphur dioxide. The power generated at these large central generating stations is then distributed across wide expanses through transmission lines.

One problem with such transmission is the large scale loss of power for technical reasons and because of theft. Globally, India has among the highest rates of loss of power during transmission - 40 per cent, compared to 10 per cent in the UK and 20 per cent in Sweden.

All these factors have forced the US and European governments to question whether large scale power generation and transmission is necessary at all. Legislation in Europe is moving towards refusing permission for such large scale power plants and, in its place, installing smaller and more efficient co-gen / CHP plants.



Co-generation (or co-gen) is the simultaneous production of electricity and thermal energy from a single fuel source. Thermal efficiency can further be used for Generation of hot air / steam or drive chillers for cooling application. It is also commonly referred to as 'CHP' or 'combined heat and power'. It can be achieved through turbine/engine run on gas / liquid which produces electrical power as well as heat in the form of hot gas which is further converted into steam / hot water or used for driving chiller for space air conditioning or process chilling.

Co-gen plants can achieve thermal efficiency between 70-95 per cent compared to the 30-40 per cent in traditional coal based power plant



As a result, the cost of producing a unit of electricity through a co-gen / CHP plant is much lower than that producing electricity by the state electricity boards and typically, a co-gen plant can produce power at Rs.2.00 - 2.50 per unit, after providing credit for the steam and chilling produced, against Rs. 4.00 - 5.50 per unit cost of most electricity boards. This, however, clearly assumes that the heat energy co-generated gets effectively utilized

Generally, co-gen plants are ideal for industries such as paper and boards, cotton spinning, glass and ceramics, bulk chemicals and petrochemicals, and rubber tyre plants as well as space heating and cooling required in commercial building. Five Star Hotels, universities, large hospitals, computer data center etc

These industries commercial building require heat energy for activities such as heating/drying, refrigeration, etc., apart from the electrical energy.



Though relatively smaller in size, co-gen plants are growing in importance outside India. In Europe, barring a few countries, all countries have made it known that co-gen plants will be given preference over traditional power plants. The aim is to keep the environment clean. Co-gen is being increasingly looked upon as an alternative means of generating power. Apart from the polluting effects of large power plants, the impact of transmission of high voltage power on the health of people, is a propelling reason for the growth of co-gen.

**In countries like the Netherlands, nearly 40 per cent of the total power generation will be based on the co-gen route by end-2000.**



In the US and European countries, CHP proposals are promoted through various incentives and tax breaks that assume that fuel is a national wealth and needs to be used in the most efficient way and in a way that is environment-friendly too. Co-gen plants produce less than half the amount of carbon dioxide that coal-based power plants do.

The concept of co-gen is yet to pick-up in India, since awareness is limited and there is no serious promotional drive from the government. In fact, most electricity boards discourage companies that propose producing their own power for fear of losing their stranglehold on the consumers and losing revenues.



India needs to review its entire power plant type, size and location, looking into the changed scenario of a large number of liquefied natural gas terminals coming up along the western and southern coast of the country. New power-intensive industrial plants which need energy in the form of heat as well as power can very well re-locate their plants in the vicinity of these LNG terminals/trunklines and gain the advantage of lower-cost and more efficient power.

LNG/pipe natural gas retail/bulk marketing company should lay gas pipeline across major towns/industrial estates and fix right price of gas, which will benefit both buyer and seller.

The government should look at this issue dispassionately and, in the larger interest of the society and country, formulate policies that will encourage co-generating plants, including standby support through SEB grid, power wheeling and trading.

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**Reference:**

<http://www.greenbusinesscentre.com/casestudy.asp>