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# The Alternative Bagasse Cogeneration Program



*Bagasse handling unit at Godavri Sugar's 24 MW bagasse cogeneration plant in Karnataka, Photo: Sandeep Tandon*

Biomass cogeneration projects using renewable fuels are environmentally friendly and carbon-neutral, in contrast to coal-fired power generation which is a source of high levels of particulates such as sulfur, nitrous oxides and other greenhouse gases. As these projects are located in rural areas, they also help to both drastically reduce transmission and distribution losses. Every 1 MW of electricity fed from bagasse cogeneration project is equivalent to 1.67 MW fed by a coal-fired power plant. To encourage increased and efficient use of biomass and sugar cane waste (bagasse) at sugar mills, USAID/India launched the Alternative Bagasse Cogeneration (ABC) program in 1995.

Support was provided in the form of grants and technical assistance to nine private sugar mills that came forward to invest in cogeneration. USAID engaged the U.S. Department of Energy's National Energy Technology Laboratory to provide technical assistance, supervision, training and performance evaluation, and the Industrial Development Bank of India to manage the project's investment-related activities.

USAID offered a conditional grant of US\$40,000 per Megawatt (MW) to the private sugar mills for installing and operating high-efficiency biomass cogeneration (the size of cogeneration plants ranged from 12 MW to 24 MW). USAID's commitment helped nine private sugar mills to achieve financial closure with the banks at commercial terms. USAID provided a combined financial assistance of US\$7.2 million for the nine projects and technical assistance and training worth US\$2 million to promote bagasse cogeneration in India. USAID's equity contribution was leveraged to generate an additional 20 times more in funds from local banks and project developers. The active participation of a number of local banks in lending to these projects helped to build the banks' capacity to understand the bagasse cogeneration business. The presence of engineering firms, equipment suppliers and banks also helped in ensuring continuity of the concept after USAID support ended.

The partners worked together to overcome the difficulties of project implementation. This included the hurdles of signing power purchase agreements with local state electricity boards with obsolete policies that discouraged private power from being fed into the grid. Power sector reforms in India encouraged local power production, and slowly one state after another has adopted power sector reform.

These USAID projects set a precedent by demonstrating a business model based on high-efficiency 270-day cogeneration using sugar cane waste and other biomass fuels. As a result of the USAID program, additional bagasse cogeneration capacity is being developed on purely commercial terms throughout India. In 2003, when USAID assistance in this sector ended, the nationwide installed capacity of biomass and bagasse cogeneration projects stood at 381 MW out of which 195 MW was contributed by projects supported under the ABC initiative. Five years later, the total installed capacity has gone up nearly 4 times to 1,253 MW. Given that the current installed capacity of the total biomass/bagasse based distributed generation is only 20% of the total estimated resource, the potential benefits of more projects is vast.

For more information contact Sandeep Tandon, email:  
[sandeep\\_tandon@yahoo.com](mailto:sandeep_tandon@yahoo.com).