



**National Chemical Laboratory**

(Council of Scientific & Industrial Research)

Dr. Homi Bhabha Road, Pune – 411 008, India



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## Publication and Science Communication Unit

Press release

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### **CSIR / NCL signs Technology Transfer Agreement with The Godavari Sugar Mills Ltd (GSML), Mumbai**

An agreement for transfer of a technology for chemical fractionation of sugarcane bagasse to its constituent polymers and chemicals was signed on July 16, 2008 between CSIR / NCL and GSML, Mumbai, at Pune.

This agreement will enable CSIR/ NCL and GSML to further jointly develop a commercially viable technology based on the results of laboratory work and pilot plant demonstration. GSML was an industrial partner of the project beginning 2002 in a public-private partnership mode under NMITLI programme of CSIR. GSML is planning to make substantial investments into scaling-up the process and validating the technology at a commercial level.

The process developed by a team of scientists led by Dr A.J. Varma at NCL consists of a novel method to fractionate bagasse, a by-product of sugar production, into its constituent polymers, namely, cellulose, hemicellulose, and lignin. Each of these is a platform material used to produce, in turn, a variety of industrially useful materials and chemicals. These materials can replace several synthetic materials made from petrochemical sources. The importance of the project also stems from the fact that about ninety million tons of sugarcane bagasse is produced every year and can provide a valuable source of raw material for obtaining value added materials. A 100 kg / batch demonstration unit has been designed by NCL and installed at GSML, Sameerwadi, Karnataka. There are only two or three such processes currently in demonstration around the world.

The uniqueness of NCL's process lies in the fact that it involves a minimum number of chemical steps. High pressure steam has been made use of to loosen the constituents of bagasse and convert the physical structure of the remaining mass into a form that enables quicker reactions downstream. According to Dr Varma, a senior scientist at the Polymer Science and Engineering Division of NCL, this work is expected to benefit an emerging field of research known as "secondary agriculture", wherein hitherto considered "waste products" from agriculture can now be converted to value-added products replacing several petroleum based products

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Communication  
channels

Phone  
+91-20-2590 2034/ 2025 (O)  
+91-20-2590 2530 (R)

Fax  
+91-20-2590 2680

Website  
[www.ncl-india.org](http://www.ncl-india.org)  
e-mail: [pk.ingle@ncl.res.in](mailto:pk.ingle@ncl.res.in)

The demonstration of this process within the confines of a sugar production unit marks the first step towards validating the concept of a “sugar biorefinery”. In the future, a “sugar” manufacturing unit will produce a range of chemicals and materials as well as energy and steam in an “integrated” manner akin to a modern day petroleum refinery, bringing in its wake significant efficiencies. Sugar may indeed, one day, become one of the many products such a “biorefinery” will produce. NCL and GSML are continuing to work together to further elaborate this vision and put in place other “building blocks” of a biorefinery.

It is also pertinent to note that a biomass (bagasse) fractionation unit, such as the one installed at GSML, is also a necessary pretreatment operation in many biomass to ethanol conversion process. NCL and several other partners are currently involved in a programme of research aimed at developing efficient enzymatic conversion process of biomass (bagasse) to ethanol.

	
<p>Pre-fractionation plant at GSML, Sameerwadi</p>	<p>Dr. S. Sivaram, Director, NCL and Shri Samir Somaiya, Executive Director, GSML exchanging the agreement document</p>

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**Notes to Editor:**

**The New Millennium Indian Technology Leadership Initiative (NMITLI)** programme of CSIR is the largest public-private-partnership in R&D domain in India. It seeks to build, capture and retain for India a leadership position in technology by synergising the best competencies of publicly funded R&D institutions, academia and industry. NMITLI has so far evolved fifty-seven networked projects in diverse areas viz. agriculture & plant biotechnology, general biotechnology, bioinformatics, drugs & pharmaceuticals, chemicals, materials, information and communication technology and energy. These projects involve eighty industry partners and two hundred seventy R&D centres. Approximately 1700 researchers are engaged in these projects. NMITLI has carved out a unique niche in the innovative space of R&D project identification and management in India in public-private partnership mode and has become a model for other funding agencies within India for emulation

**National Chemical Laboratory (NCL)** ([www.ncl-india.org](http://www.ncl-india.org)), Pune, India is a research, development and consulting organisation with a focus on chemistry and chemical engineering. It has a successful record of research partnership with industry. National Chemical Laboratory (NCL) is a flagship laboratory of the Council of Scientific & Industrial Research) which is the largest network of publicly funded research institutes in India.

**The Council of Scientific & Industrial Research (CSIR)** ([www.csir.res.in](http://www.csir.res.in)) is the premier industrial R&D organization in India, constituted in 1942, is an autonomous body registered under the Registration of Societies Act of 1860. CSIR aims to contribute to industrial competitiveness, societal welfare, strong S&T base for strategic sectors and advancement of fundamental knowledge. CSIR is recognised as one of the world's largest publicly funded R&D organisations having linkages with academia, R&D organisations and industry. CSIR's 38 laboratories knit India into a giant network that impacts and add quality to the life of each and every citizen of India. CSIR's R&D portfolio embraces diverse areas such as aerospace, biotechnology, chemicals...indeed, almost the ABC-Z of Indian Science!

**The Godavari Sugar Mills Ltd. (GSML)** ([www.somaiya.com](http://www.somaiya.com)) has been contributing to the industrial development of India for more than six decades. The Company operates two fully integrated sugar mills in Karnataka and Maharashtra. GSML is among the top ten Sugar complexes in India. The Company is one of the largest producers of industrial alcohol and a pioneer in manufacture of alcohol based chemicals.