The given technological innovation deals with production of nanocellulose from cotton linters and other cellulosic biomass. Production of nanocellulose is an energy intensive process that affects its scaling up for commercial production. In spite of being many processes available for energy reduction, they are limited to pilot scale and not yet reached the commercial production. Our technology is primarily focused for reduction of energy consumption in an eco-friendly way towards production of nanocellulose cotton linters in an energy efficient way.

Benefits / Utility
This technology will lead to eco-friendly pre-treatment process for the production of nanocellulose. Reduction in energy consumption to the tune of 40% will make it attractive in commercial point of view. While the existing technologies are focused on wood based nanocellulose, present technology is primarily focused on cotton fibres / linters.

Country
India

Scalability
Current scale of operation: 2.5 kg per day Proposed pilot scale: 10 kg per day Potential scale of operation: 100 kg per day

Business and Commercial Potential
Business Potential: Nanocellulose is being developed for applications in pulp and paper production, scaffolds in tissue engineering, biodegradable food packaging, polymer reinforcements, anti-microbial films, flexible electronics, pharmaceutical applications, nanofilters. The current volume of production is 350 tonnes per year which is estimated to be 1667 tonnes per year in 2017 (Survey by Futures Markets Inc, 2012). As of now, no production units are available in India.

Market Response: In the recently concluded Entrepreneurship Development Programme on nanocellulose (11-13 March 2013 at CIRCOT, Mumbai), 23 entrepreneurs showed interest towards this

Potential investors to this technical innovation
- Pulp and paper industries
- Composites manufacturers
- Medicine and life sciences
- Nanofilters manufacturers
- Cotton ginneries and cottonseed oil mill industries
- Paint Industries

Financials

VALUE OF THE TECHNOLOGY

Project cost = Rs. 100.22 lakhs
Innovating team/organization’s margin 15% = Rs. 15.00 lakhs
Revenue to be generated by tech commercialization =
Rs. 75.00 lakhs
Tech commercialization fee to be charged from one licensee =
Rs. 15.00 lakhs
Financial Required:
Fix assets (Land and Building) = Rs. 7.20 lakhs
(Rental charges till BEP i.e., 24 months) = Rs. 48.505 lakhs
Machinery = Rs. 41.815 lakhs
Others =
Pre-operative expenses = Rs. 2.70 lakhs

Limiting factors for large scale commercialization
Lack of well-defined fields of application for nanocellulose -Lack of awareness among the stake-holders about the product

Social impact of the technology
Enhanced farm income because of value addition to cotton linters and other cellulosic biomass of agricultural origin
Job creation by establishment of new agro-based industries
Novel and high-strength bio-based material for various applications

Any other relevant information
The pilot plant under establishment at CIRCOT, Mumbai will be the first of its kind in India to produce nanocellulose from various biomasses including cotton linters, sugarcane bagasse and wood pulp with an estimated capacity of 10 kg per day.