

# **Centre of Excellence in Nanotechnology** **Ahmedabad, Gujarat.**

## **About Nanotechnology**

Nanotechnology is the study of production and manipulation of materials at atomic, molecular and macromolecular scales, where properties differ significantly from those at larger scale. Nanotechnology has proved to be the greatest impulse to technological and industrial development in the 21st Century and has been recognized as an emerging technology that is set to play a pivotal role in various industry segments. Nanotechnology offers immense promise for developing new technologies that are more sustainable than current technologies. Nanotechnology industry has been growing at a rapid pace with rising applications in sectors like electronic, energy, healthcare, personal care sector etc. The global market for nanotechnology was valued at nearly \$20.1 billion in 2011 and total sales are expected to reach \$48.9 billion in 2017 after increasing at a five-year compound annual growth rate (CAGR) of around 20% during 2012 – 2017.

## **About Green Nanotechnology**

Green nanotechnology can be described as the development of clean technologies, "to minimize potential environmental and human health risks associated with the manufacture and use of nanotechnology products, and to encourage replacement of existing products with new nano-products that are more environmentally friendly throughout their lifecycle." Green nanotechnology provides a strong foundation for products and processes that are safe and have a low net environmental impact, being energy efficient, reducing waste, lessening greenhouse gas emissions and using renewable materials. Green nanotechnology has many applications including Chemical & Pharmaceuticals, Food Processing, Paper, Electronics & Domestic Appliances, Auto, Ceramics, Color and Optics, Energy, Oil & Gas, Glass, textiles etc. Despite significant private and public investment in nanotechnology, progress moving the nanomaterials from the laboratory to industrial production has been slow and difficult. Scientists, engineers and entrepreneurs, however, continue to move forward, grappling with challenges that range from the technical to the regulatory and everywhere in between. However, there are many issues which needs to be addressed to develop the processes and products using green nanotechnology.

## **Vision**

Enabling Indian Industry to adapt Green chemistry / nanotechnology in developing green processes / products to reduce the environmental pollutions and make the resources more sustainable.

## **Core Purpose**

To encourage knowledge and experience sharing and conduct collaborative research with various industries and academic institutions to promote innovations and initiatives, creating awareness among the end-users, facilitating the technology and training related needs of the industry through national and international networking and to establish policies and standards for nanotechnology processes etc.

## **About Us**

CII in collaboration with Government of Gujarat has established a Centre of Excellence in Nanotechnology (COENT) at Ahmedabad, Gujarat where world renowned experts would be developing cutting-edge nanotechnologies in the state-of-the art labs equipped with latest instruments. The theme of the centre is to develop clean and green nanotechnology processes for different industrial applications. The centre proposes to apply the superior physical, chemical and biological properties of nanomaterials and strive to reduce the environment pollution and cost of production by adapting green chemistry and green engineering based approaches based on renewable or natural materials in the areas of health, automotives, sustainable energy, textile, dyeing, food supplements etc. The centre aims to identify and use supercritical fluid (SCF) based reaction

engineering technology to synthesize nanomaterials at laboratory scale to demonstrate the proof-of-concept followed by a modest size pilot plant demonstration.

## Objectives

- To produce the nanomaterials by reducing the cost of production and environment pollution by adapting green chemistry and green engineering based approaches.
- To identify and use supercritical fluid (SCF) based reaction engineering technology to synthesize nanomaterials at laboratory scale
- To demonstrate the proof-of-concept by a pilot plant demonstration based on green nanotechnology.
- To conduct collaborative research with various industries and academic institution in India and abroad
- To play a key role in advocating issues to the Government and regulators to establish policies and standards for nanotechnology processes and in chartering the road-map ahead.
- Creating awareness among the end-users and consumers on nanotechnology.
- Facilitating the technology requirement and other related needs of the industry through networking.
- Facilitating the training needs of the start-up companies.

## Partners

- Government of Gujarat
- Industry
- Universities and Institutes
- Society
- Global organizations

## Services and activities

### 1) Projects, Advisory & Training Services

- To facilitate collaboration and technology transfer between academia and industry.
- To identify the nanotechnologies developed by concerned institutions and R&D labs, technology evaluation, scale-up and finding industrial partners for the same.
- Provide paid services to Industries in their technology evaluation, feasibility, scale-up and commercialization etc.
- Provide training to the industries / students on processes, instruments etc.

### 2) Policy Advocacy & Research

- Sector specific concept/white paper and policy watch
- Central & State level
- Involvement of all stake holders
- Consensus driven & Easy implementation

### 3) Information & Demonstration Center

- Awareness raising programmes on green nanotechnology
- Demonstration of innovative green nanotechnologies
- Enabling next practices by promoting joint ventures, delegations and good practice projects

- Enable international partnerships
- Networking and stakeholder involvement

#### 4) Events



One day workshop on “Green Nanotechnology and Modern Industries” at CII House, Ahmedabad on 25<sup>th</sup> October, 2013.

#### Contacts

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