

NANOTECHNOLOGY COMPANIES IN ENERGY SECTOR AND ITS BUSINESS PURVIEW IN INDIA

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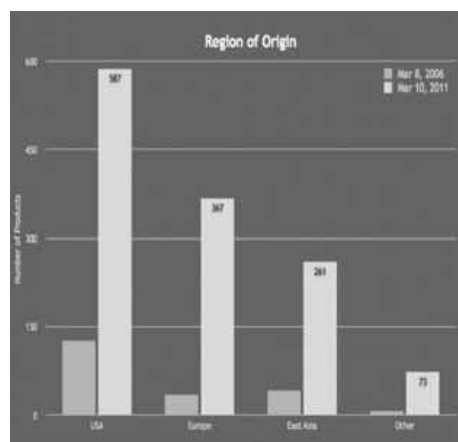
ABSTRACT

After more than twenty years of basic and applied research, Nanotechnologies are gaining in energy sector also. Nano-scale materials now are in electronic, cosmetics, automotive and medical products etc. However, it has been difficult to find out how many "Nano" consumer products are on the energy market and which merchandise could be called "Nano." According to the project on emerging Nanotechnology (PEN), there are currently 1317 products, produced by 587 companies, located in 30 countries. In this paper we will study nanotechnologies companies related to energy sector and its business purview in India.

Keywords: PEN, NANO, UK, USA, NSTC.

I. NANO-TECHNOLOGY PRODUCT'S COUNTRIES

The United States have the most products, with a total of 587, followed by companies in Europe (UK, France, Germany, Finland, Switzerland, Italy, Sweden, Denmark, The Netherlands) (367), East Asia (including China, Taiwan, Korea, Japan) (261), and elsewhere around the world (Australia, Canada, Mexico, Israel, New Zealand, Malaysia, Thailand, Singapore, The Philippines, Malaysia) (73). Australia, Canada, China, Denmark, Finland, France, Germany, Israel, Italy, Japan, Korea, Malaysia, Mexico, Netherlands, New Zealand Norway, Austria, Philippines, Singapore, Sweden, Switzerland, Taiwan, Thailand, UK, USA, Central and Eastern Europe, Czech Republic, Lithuania, Poland India



1.1 Nano companies at different countries

Well over 2000 companies worldwide already involved in Nanotechnology at the latest count, over 2200 companies from 48 countries are involved in Nanotechnology research, manufacturing or applications - a number that keeps growing at a considerable pace. With more than 1100 companies, the U.S. is home to roughly half of all Nano- technology firms. 670 companies are in Europe, 230 in Asia and 210 elsewhere in the world. Within

1.2 Nanotechnology companies and Business purview in India

Europe, Germany is represented with 211 companies, followed by the U.K. with 146 companies. Over 270 companies are involved in the manufacture of raw materials such as Nano- particles, Nano fibers and -wires, carbon Nano- tubes, or quantum dots. More than 340 companies are active in life sciences and pharmaceutical fields. The vast majority with well over half of all companies are involved in manufacturing instruments, devices, or advanced materials and components. World's 2216 companies which are involved in Nanotechnology business [4].

1158 Nanotechnology companies in USA

224 Nanotechnology companies in Germany

157 Nanotechnology companies in UK

85 Nanotechnology companies in Canada

62 Nanotechnology companies in Japan

50 Nanotechnology companies in Australia

50 Nanotechnology companies in Switzerland

40 Nanotechnology companies in India

1.3 Nanotechnology companies in PR China

1.4 Nanotechnology companies in France

28 Nanotechnology companies in South Korea

27 Nanotechnology companies in Sweden

27 Nanotechnology companies in Spain:

26 Nanotechnology companies in Netherlands

25 Nanotechnology companies in Finland

23 Nanotechnology companies in Israel

19 Nanotechnology companies in Italy

18 Nanotechnology companies in Denmark

18 Nanotechnology companies in Singapore

14 Nanotechnology companies in Austria

13 Nanotechnology companies in Russia

- 11 Nanotechnology companies in Taiwan
- 8 Nanotechnology companies in Czech Rep
- 4 Nanotechnology companies in Iran
- 3 Nanotechnology companies in Mexico
- 5 Nanotechnology companies in New Zealand
- 3 Nanotechnology companies in Turkey
- 2 Nanotechnology companies in Malaysia
- 2 Nanotechnology companies in Norway
- 1 Nanotechnology companies in Poland
- 1 Nanotechnology companies in Lithuania
- 1 Nanotechnology companies in Thailand
- 1 Nanotechnology companies in UAE

II. NANO-TECH COMPANIES OF INIDA

2.1 Nano-technology Companies in Delhi and NCR

- Dabur Pharma [New Delhi] one of the company's delivery systems in the most advanced stages of clinical development is a novel drug delivery system for Paclitaxel. Because of the better safety and pharmacokinetic profile, the polymeric. Nano-particle delivery system is seen as a potential super generic.
- Mittal Enterprises [New Delhi] The company manufactures ultrasonic instruments like Ultrasonic Interferometer, other laboratory, and scientific instruments
- Reinste Nano Ventures [Noida] A manufacturer of Nano-materials
- Kemflo [New Delhi] Kemflo water purification system has launched kemflo silver Nano model, its purification capacity is 8-10 Ltr per hrs and storage tank capacity is 8 Ltr. Maximum duty cycle is 75 Ltr per day. It is a reverse osmosis system and it has used a sediment activated carbon coated with nano silver as a filter cartridges.
- White hawk™ [New Delhi] White hawk researched and adopted latest Hexa Nano Silver (HNST) and double purification technology to purify water, which gives pure, healthy and safe drinking water free from bacteria, viruses, dissolved impurities, undesirable salts, toxic chemicals, pesticides and heavy metals with balanced materials
- **NSTC (Nanoscience and Nanotechnology consortium) [Noida]**
A uniquely positioned body that acts as a Nanotechnology platform, NSTC brings together various stakeholders in the Nanotechnology arena and binds them together, enabling them to reach their final destination. NSTC has been performing this role to past six year. NSTC work area: technology transfer, facilitation of global and local business opportunities, training and education, publication and collaborative process in nanotechnology
- Purocom [New Delhi] Purocom came into existence in 1992. Nano silver appears to be a powerful natural

antibacterial prevented against infections. As a catalyst, it reportedly disables the enzymes needed by bacteria, viruses & fungi for their oxygen metabolism. It kills over 650 different bacterial species

- Lucent water bottle [Noida]
- Lucent is using Nanotechnology filtration technique for purifying the water.
- Royal blue water bottle Royal blue is using Nanotechnology filtration technique for purifying the water
- PROVEDA HERBAL'S [New Delhi] The body care™ (By Nature) Proveda herbal's is making nano technology facial kit
- Ranbaxy pharmaceutical Ranbaxy Laboratories Limited (Ranbaxy), India's largest pharmaceutical company, is an integrated, research based, international pharmaceutical company, producing a wide range of quality, affordable generic medicines, trusted by healthcare professionals and patients across geographies. Ranbaxy today has a presence in 23 of the top 25 pharmaceutical markets of the world. The Company has a global footprint in 46 countries, world-class manufacturing facilities in 7 countries and serves customers in over 125 countries. Ranbaxy sunscreen is also making nanotech TiO₂ based sunscreen.

2.2 Nano-technology Company in south and south west India

- Bilcare [pune] Bilcare has developed a unique security technology called non Closable. The technology innovatively exploits the intrinsic nature of Nano and micro-structured composites together with their magnetic and optical properties to provide a foolproof security system
- Cranes Software [Bangalore] Cranes Software International Limited is a company that provides Enterprise Analytics and Engineering Simulation Software Products and Solutions. The company also focuses on niche research programs in some promising emerging technologies like MEMS and Nanotechnology
- Icon Analytical Equipment [Mumbai] The company is a distributor of analytical instruments, with a focus on Nano- technology and related analytical techniques
- Micro materials (India) [Bangalore] Micro materials (P) Ltd. is a Bangalore based company focused on developing innovative Nano and micro technologies and materials catalysts. The new generation catalysts are the result of a radically new-patented process
- Mp3s Nanotechnology [Mumbai] The company's activity is the manufacture of equipment and chemicals based on Nanotechnology. Its products include equipment for textile wastewater recycling in dyeing and other process
- Nano Cutting Edge Technology NanoCET [Mumbai] Contract Research and New Product Development Work involving Bio-stabilized Nanoparticle technology
- NanoBio Chemicals [Belgaum, Karnatka] The mission of NanoBio Chemicals is to be the foremost producer of high quality Nano- particles using patented technology and custom synthesis of complex peptides and biochemical

2.3 NanoFactor Materials Technologies [Bangalore]

NanoFactor Materials Technology has a patent pending technology for synthesis of Carbon Nano-tubes

- Quantum Corporation [Bangalore] Quantum Corporation (QCorp) is the parent company of group of

companies, head quartered in Bangalore, India. QCorp was established in 2007 with a vision to create world class Nano-materials and Nano-composites with strong Intellectual Property that are changing the properties of products across the globe. QCorp has developed high quality Smart Polymers, Nano-materials and Nano-composites as core materials for manufacturers in Telecommunications, Electronics, Drug Delivery, Conductive films, Lighting and Energy industries - without the need to change their existing processes

- Quantum Materials Corporation [Bangalore] The company manufactures carbon Nano- tubes and grapheme
- Kenstar [Aurangabad, Maharastra] Kenstar has launched the water purifier, which has Kills diseases causing bacteria & virus. Using Nano Silver Ceramic Balls in the purification of water
- Jyothy Laboratories Ltd [Mumbai] A Jyothy laboratory is making Nanotech detergent powder
- Prakruthik Health Care Pvt Ltd [Hyderabad] Prakrutik Health care Pvt ltd. Has launched herbal medicine and cosmetic cream Candila health care limited [Ahmedabad] Candila Health Care ltd.has launched nano gel for pain relief for bones Raymonds [Mumbai] Raymonds is an nano textile company,it has launched Nanotech shirt and Nanotech trouser in its park avenue parx brand Arvind Mill's [Ahmedabad] Arvind Mill's is a nano textile company it has launched Arrow Nanotech Shirt and Nanotech trousers
- Velbio Nanotech [Bangalore] An R&D company in the Nano-bio and Nano-medicine area
- Yash Nanotech [Mumbai] Business information & consulting, arm of Yash Management & Satellite Ltd in Nanotechnology. It aims to provide global Nanotechnology business intelligence and consulting services to industries and investors worldwide Hindustan Unilever Ltd. [Mumbai] Hindustan Unilever Ltd. has Launched Sunsilk nano complex shampoo
- Saint-Gobain Glass [Chennai] The company manufactures SGG NANO, a high performance coated glass with advanced energy efficient solar control and thermal insulation (low e) properties. This Advanced Solar Control and Thermal Insulation (low e) Glass is manufactured by deposition of multiple layers of highly specialized Nano-metric metallic oxides
- U-Shu Nanotech [Vadodara] A consultant company is providing services to the Nanotechnology community in India

2.4 Nanotechnology Companies in East India

- United Nanotechnologies [Kolkata] Manufactures Nano particle - based coatings
- Tata chemicals [Haldia, W.B] The Tata swach water purifier developed by Tata chemicals a part of Tata group in India The Swach was designed as a low cost purifier for Indian low income groups, who lack access to safe drinking water Tata swach win gold at the award ISDA (Industrial designed society of America) design of the decade
- Auto Fibre Craft [Jamshedpur] AFC Powders is a company involved in manufacturing specialized Nano-materials. Currently it is manufacturing Nano-size Silver Powder for use in electronic applications for e.g. making conductive inks and pastes, RFID. This product is RoHS compliant.

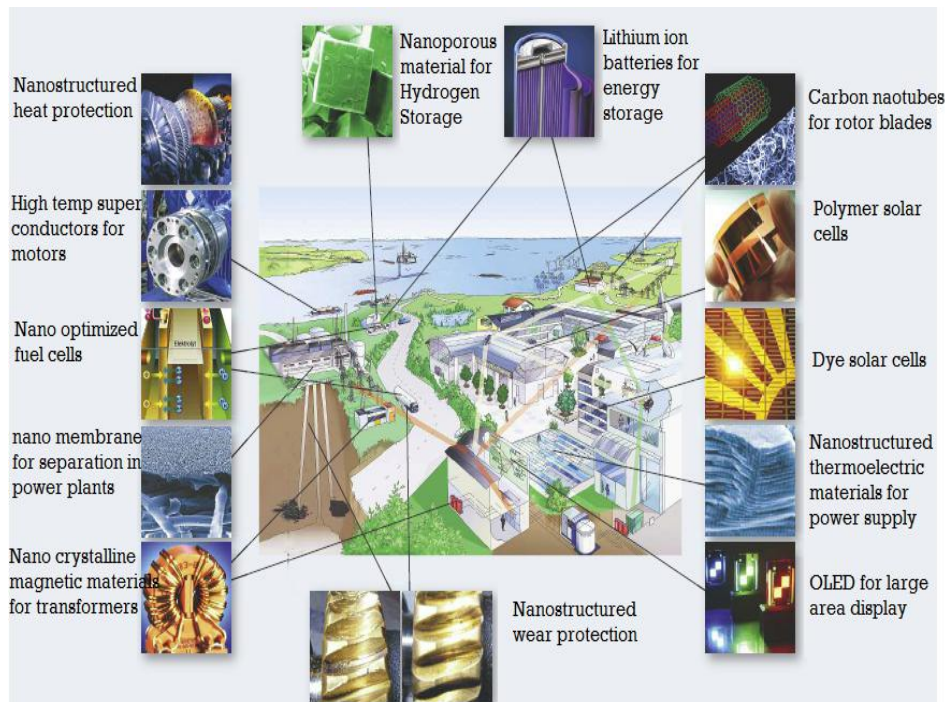
2.5 Nanotechnology Companies in North India except Delhi and NCR

- Bee Chems [Kanpur] a chemicals company focused on the silica and alumina industries. Manufactures various grades of Nano Silica products
- Eris Technologies [Mohali] Eris Technologies is a software development company that also provided industrial training in areas like Nanotechnology.
- Certification in Nanotechnology covers course in applied Nanotechnology where the dimensions and tolerances in the range of .1nm to 100nm play a critical role. The course covers Nanotechnology basics, manufacturing process, and lithography, CNT, Nano-computers, Nano-medicine and Nano-diamond.
- Nanoshel [Panchkula] Nanoshel makes more than 50 types of Nano-materials, among which the main products are Nano-tubes, SWCNT's, MWCNT's, Nano-particles
- Neo-Ecosystems [Dehradun] The company is specialized on researching and production of metal Nano-powders
- St. Botanica [Panchkula ,Haryana] St.Botanicais a nanotechnology company it has launched nano technology breast cream and Botanica Cupidrex Serum for Men/
nitrides by a process of magnetically enhanced Nanotechnology-based cathodic sputtering under vacuum conditions

III. BUSINESS PURVIEW

Nanotechnology has enormous potential to change society. The yearly investment of global Nanotechnology research and development to the medical treatment, tools, more efficient energy (production, storage and transmission), production of lighter material, stronger material, better access to clean water, more effective pollution(reduction and prevention) is \$9 billion per year. These are just a few of the more significant ways in which people are discussing using the technology it helps to improve products and production processes with better characteristics or new functionalities "in coming years. Products based on Nanotechnology are expected to impact nearly all industrial sectors, entering into the consumer market in large quantities" after more than twenty year of basic research and applied research, Nanotechnologies are gaining in commercial use. Nano-scale materials now are used in cosmetic, electronic, automotive and medical products., Some Nanotech products are given with their price, country of origins, company and products picture. there are about 1300 + products available in the global market For more product we can visit at www.Nanotechproject.org and for some Asian products we can go at www.alibaba.com As of March 2011, the products has grown by nearly 521% (from 212 to 1317 products) since it was in March 2006 [4].

3.1 Application Possibilities of Nanotechnology in Energy Sector



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