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Cleantech startups in India

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Abstract

Technology was dreamt up with the sole aim of providing an aiding hand to the human kind. But, somewhere during the whole process, human beings became so much self-involved that they lost track of other important things like the environment that the technology could help them with. Fortunately, some percentage of human race did take note of the situation and decided to change it by coming up with clean technology or cleantech. India is a land rich with natural resources but at the rate at which we're consuming, something needs to be done in order to conserve these natural resources for the future brigade.

Cleantech has emerged as an umbrella term encompassing the investment asset class, technology and business sectors which include clean energy, environmental and sustainable or green, products and services. In this paper an attempt is made to introduce the concept of cleantech startups; to briefly discuss why incepting cleantech startup important and to communicate the readers a list of successful cleantech startup operating in India.

Keywords: technology, cleantech, cleantech startups

Introduction

Cleantech often used interchangeably with the term greentech. The term has historically been distinguished from various definitions of green business, sustainability or triple bottom line industries by its origins in the venture capital investment community and has grown to define a business sector that includes significant and high growth industries such as solar, wind, water purification and biofuels.

Clean technology (clean tech) is a general term used to describe products, processes or services that reduce waste and require as few non-renewable resources as possible.

The Clean Technology Trade Alliance, a global initiative to drive the expansion of clean tech, defines it as "A broad base of processes, practices and tools, in any industry that supports a sustainable business approach, including but not limited to: pollution control, resource reduction and management, end of life strategy, waste reduction, energy efficiency, carbon mitigation and profitability."

Importance of cleantech startup

Start-ups are driving disruptive innovation and the growth of clean technology. They develop the technologies, business models, products, and services required to deploy and finance cost-effective cleantech solutions at scale. They create jobs and new opportunities for inclusive growth. 70% of renewable energy companies in the People's Republic of China were founded after 2010. 4 of top 10 global electric car manufacturers are less than 15 years old.75% of India's solar PV capacity installed by young entrepreneurs. New disruptive innovations are unlocking new big cleantech markets

Factors that drive for cleantech

Economic growth and sustainability are interdependent. With finite natural resources, ballooning population growth, increased urbanization and ageing and inadequate infrastructure, the status quo cannot be maintained and the value of investments cannot be preserved into perpetuity. Instead, companies have to respond to the need for cleaner, leaner and more sustainable products and services that will provide the best long-term shareholder value.

The following factors open up market for cleantech products and services:

- Overall population is still expected to increase rapidly, to 9.3 billion by 2050, mostly in developing regions of the world, further increasing pressure on limited resources, increasing supply challenges and creating price instability.
- As developing countries industrialize rapidly, global demand for resources is predicted to increase dramatically, leading to increased resource scarcity. Businesses are likely to face more trade restrictions and intense global competition for a wide range of resources that become less easily available. Scarcity also creates opportunities to develop substitute materials or to recover materials from waste.
- Increasing urbanization has a direct impact on how we consume resources. For example, it increases demand for electricity and leads to more stress on energy grids. By 2030 all developing regions including Asia and Africa are expected to have the majority of their citizens living in urban areas.
- Energy and resource independence have long been strategic imperatives for many countries. Long term access to sources of energy and raw materials such as oil, minerals, metals and biomass become more acute for economic security as populations rise, energy-producing regions destabilize, supplies dwindle and national security becomes an increasing priority. Biofuels are being sought by military forces worldwide today in an effort to ensure continued national security.
- Climate change is a force that will exacerbate many of these drivers. Eleven weather-related disasters cost the U.S. $110 billion in 2012.8 Moreover, predictions of annual output losses from climate change range between 1% GDP per year, if strong and early action is taken, to at least 5% per

year if policymakers fail to act.

- Consumer desire for cleaner, less toxic products has changed purchasing patterns and driven the creation of new materials. Americans are now integrating green products into their lifestyle, with 71% now considering the environment when they shop and 45% seeking environmental information about products they buy.
- Changing policy and regulatory requirements designed to address the impacts of an increasingly industrialized world—including air pollution, water pollution, loss of habitat, climate change and resource competition, among others— influence many investments and projects.
- In the face of growing constraints and increasing prices, corporations and consumers are seeking increasingly efficient ways to cut costs and increase efficiencies, especially in periods of declining revenue. As such, demand for technologies with high return on investment (ROI) and quick payback periods will increase.
- The number of relatively wealthy people (the middle class, essentially) is expected to increase. Individuals with more disposable income find themselves wanting to acquire more products, which grow scarcer.
- Risk mitigation, is also an important driver of cleantech infrastructure and innovation.

Table 1: successful cleantech startups and their attainments in India

S No.	Cleantech Startup	Founders	Year of Inception	Attainments
1	Husk Power Systems	1. Gyanesh Pandey, 2. Manoj Sinha, 3. Ratnesh Yadav 4. Charles W. Ransler,	2007	In just four years HPS has installed 84 mini-power plants, providing electricity to over 200,000 people spread across 300 villages, and employing 350 people operating across the state of Bihar. Each plant serves around 400 households, saving approximately 42,000 litres of kerosene and 18,000 litres of diesel per year, significantly reducing indoor air pollution and improving health conditions in rural areas. By extending village life beyond daylight hours, HPS promotes economic development by enabling businesses to stay open after dark and allowing children to study at night. HPS creates an ecosystem around each plant by providing income generation opportunities to local farmers and entrepreneurs. Additionally, it creates employment through its livelihood programmes such as the incense stick manufacturing program which largely employs women. This enables sustainable development within the communities HPS serves.
2	ONergy	1. Vinay Jaju, 2. Ekta Kothari 3. Piyush Jaju	2009	ONergy provides decentralized energy solutions with an entire range of solar products. The solutions are aimed at addressing energy demands of underserved households and institutions. Till date, ONergy has impacted 2,50,000 lives by providing solutions such as solar lanterns, solar home systems, solar water heating systems, solar inverters, solar street lighting, cookstoves, KW installations for households and institutions. ONergy has also launched new and innovative products such as solar TV, solar computer, solar micro grids and solar irrigation systems.
3	Karma Recycling	1. Aamir Jariwala 2. Akshat Ghiya	2012	Since their inception, they have collected over 100 thousand mobile devices through trade-in programs, and redistributed them around the country. They have empowered many who could not afford a brand new mobile device with branded smartphones at low cost, allowing them to enter the mobile conversation. Through mobile device re-use, tons of e-waste is continually being diverted from landfills. The aim is to extend the life of a mobile device as much as possible, and when it cannot be extended any further, to recycle it responsible. We have restored an impressive 95% of mobile devices we've collected. The remaining 5% are recycled responsibly according to their zero landfill policy. The services are offered through its proprietary platform called XchangeHub that provides efficient pricing and certainty of fulfilment.
4	Surya Power Magic	1. Abhilash Thirupathy 2. Karthic Ravindranath	2012	The company makes affordable solar water pumps for farmers in power deficit regions. A list released at Startup Konnect, held by Nasscom in partnership with TiE Silicon Valley and IIM Ahmedabad's CIIE India, featured Surya Power Magic in 36 startups from India and five startups from US for companies that are building products for social cause.
5	GIBSS	1. Arun Shenoy 2. Mandar Kaprekar	2009	Green India Building Systems and Services is a Mumbai-based cleantech startup that specializes in geothermal air-conditioning technologies for cooling. Other than Geothermal Air conditioning Systems, company also provides ultra energy-efficient innovations like Hot Water Co-generation and LED lighting Systems. It has headquarters in Mumbai and has offices in Delhi, Bangalore, Hyderabad and Singapore. The company claims 50-60% reduction in cost for users, as well as proportional reduction in carbon footprint for buildings. As of 2015, the company's technology is used in 400 buildings across India,
6	Greenway Grameen Infra Pvt. Ltd.	1. Neha Juneja 2. Ankit Mathur	2011	It engages in the design, manufacture, and distribution of fuel-efficient, smoke-reducing, affordable home energy appliances for rural consumers in India. It offers smart cook stoves and jumbo stoves. The company sells its products through retail shops including Paytm. While reducing smoke by 70 per cent, fuel use by 65 per cent and GHG emissions by 1.5 tons/year. Recently, company established country's largest biomass cook-stove factory at Vadodara in Gujarat.
7	GreenObin	1. Saurabh Jain, 2. Utsav Sharma 3. Nitin Goel	2009	It provides independent recycling and waste paper management facilities. The company extends its services to both industrial and commercial customers in NCR region. The waste management services include waste audits, security shredding and custom training. The company provides pick-up services to waste once it receives a request for the same. The request can be made at the GreenObin's website.
8	Gram Power	1. Yashraj Khaitan 2. Jacob Dickinson	2010	The startup provides cutting edge Smart Grid technologies to address the electrification challenges in developing nations. In March 2012, the startup set up India's first Solar Powered Smart Microgrid in the Rajasthan hamlet of Khareda Lakshmipura, providing energy for lights, buttermilk machines, televisions and fans. So far, the startup has brought smart grids to 30 remote areas in rural India through its Smart Microgrid solution. Its now bringing its technology to the national grid by managing power distribution with its technology for India's biggest private power distribution company The startup was selected among the top 10 Cleantech Innovations by NASA in 2011.

9	Mera Gao	1. Sandeep Pandey 2. Brian Shaad 3. Nikhil Jaisinghani		Mera Gao Power, which means "my village" in Hindi language, builds, owns, and operates micro grids in Uttar Pradesh serving off-grid villages with high quality, dependable lighting and mobile phone charging services. MGP's unique model is able to provide service to a typical hamlet for $1,000, making its lowest cost design the first commercially viable micro grid targeted at the rural poor.
10	Barrix Agro Sciences	1. Lokesh Makam	2011	This particular startup realised it real soon that in order to transform and provide an eco-friendly touch to the pest control measures being currently employed in agriculture, they will have to initially focus on doing extensive research.Following this strong emphasis on research principle, the startup has been successful in coming up with some unique next generation integrated pest management tools and produces. These products are highly effective, eco-friendly, good in performance, non-chemical based crop protection products that are also easy on pocket. The company's future plans includes developing a pest control methodology with dedicated personnel and a strong supply chain, so as to have a positive impact on ecology and society.
11	Avant Garde Innovations	1. Arun George		This Cleantech startup that claims to be India's first & only startup with 100% renewable energy commitment. It aim is to introduce innovative, affordable and sustainable solutions that take renewable energy self sufficiency and energy empowerment to the next level through a distributed and decentralized approach using pioneering strategies the world has not witnessed yet. The comparatively young startup is making wind turbine generators that are extremely easy on pocket but at the same time high on performance. The startup aimed for a market launch during 2016 with its first offerings as a highly affordable small wind turbine suitable for residential, commercial, agricultural, village electrification and other uses.
12	Ecolibrium Energy	1. Chintan 2. Harit Soni	2010	The company provides energy solutions to customers to increase operational efficiency, by minimizing energy costs and improving productivity. Technology by Ecolibrium involves setting up sensors in various parts of an assembly line and its cloud-based software system which analyses the data to find power inefficiencies and recommends ways to monitor/control them. In a span of 4 years, the company has marked its presence in India and South-East Asia, with more than 450 consumers. It also monitors 1400+MW and transmits 90+ million data points to its servers daily for analysis. In India, company has footprints in Ludhiana, NCR region, Hyderabad, Chennai, Bengaluru and Mumbai among others.
13	Tessol Thermal Energy Solutions	1. Rajat Gupta	2013	Mumbai-based TESSOL is mainly into logistics and intends to transform the way thermal energy is being produced and consumed in the world at present. The startup focus on technologies that have tremendous potential to impact current thermal applications in Agricultural, Commercial and Industrial facilities. Tessol is currently focusing on the cold chain sector – transportation as well as stationary storages using the cold plates technology. It uses the brand name 'PlugnChill' for this solution.
14	Azure Power	1. Inderpreet Wadhwa	2007	Azure is an independent power producer which builds, owns and operates solar power plants in India. It also produces and distributes solar power to commercial, government and utility customers in India. The company has actively been involved in developments in the solar sector The list of major projects which company bragged recently includes 100 MW solar power capacity project as a part of the National Solar Mission. The projects will be built in the Andhra Pradesh solar park. The company also signed an agreement with the Punjab government for setting up a 150 MW plant in the state, to be the largest solar power installation in the state.

Conclusion

The Cleantech startups in India is growing year on year, seeking to produce environment-friendly products which should benefit the natural environment by adopting clean production technology and using harmless or less harmful new techniques, energy resources, and technology.

The cleantech startups are an innovative opportunity that is in harmony with nature and the environment, which limits ecological risks and seizes economic opportunities. As such, it is an integral concept in sustainable development. In the face of its huge and growing energy needs and its environmental and energy security challenge, India needs to develop green technologies that will help the country to produce cleaner energy and to consume it more efficiently. Cleantech startups are seen by the country's leaders as future pillars of the Indian Sustainable Development.

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