

**Report of the Working Group on
“Effectively Integrating Industrial
Growth and Environment
Sustainability”**

Twelfth Five Year Plan (2012-2017)

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Introduction

Industrial Growth in India

India has experienced rapid industrial growth since the enactment of the economic liberalization policies in 1991. Economic liberalization has accounted for a substantial impact on the manufacturing industry through an increase in the presence of manufacturing units, from 98,379 in a pre-liberalization period of 1987 to 1,40,355 industrial units in 2007 reflecting a 42.67% growth during this 20 year period, and a rise in the production capacity and output within individual manufacturing facilities.

The impact of the dual growth consequences introduced above, is shown by a consistent 8% compounded annual growth rate of the Index of Industrial Production during the period of the 10th Five Year Plan, 2002 – 2007. This growth has carried forward into the 12th Five Year Plan despite a reduction in 2008-09 owing to the global financial crisis, as evidenced in Table 1 below. The Construction and Mining & Quarrying sectors, which impacts and are in turn is impacted by the needs and demands of the Manufacturing sectors, have also shown similar corresponding growth rates to the Manufacturing Sector.

Sector	2005-06	2006-07	2007-08	2008-09 ^{PE}	2009-10 ^{QE}	2010-11 ^{AE}
Manufacturing	10.1	14.3	10.3	4.2	8.8	8.8
Construction	12.8	10.3	10.7	5.4	7	8
Mining & Quarrying	1.3	7.5	3.7	1.3	6.9	6.2
GDP at Factor Cost	9.5	9.6	9.3	6.8	8	8.6

Table 1: Rate of growth at factor cost at 2004-2005 prices (per cent) (Source: *Economic Survey of India, 2010-11, Ministry of Finance*). **PE: Provisional Estimate, QE: Quick Estimate, AE: Advanced Estimate**

Industrial Growth and the Environment

This rise in growth in the resource intensive Manufacturing sector is enabled and facilitated by an ever-increasing rate of material use leading to manifold impacts to the environment. The cost of environmental damage has been estimated at approximately \$32 billion as per figures identified by the National Productivity Council of India. The contribution of the manufacturing sector to environmental degradation primarily occurs during the following stages:

- Procurement and use of natural resources
- Industrial processes and activities
- Product use and disposal

Procurement and Use of Natural Resources

The first stage essential to any manufacturing process is procuring raw materials. Procurement processes tend to require the use of hazardous substances to extract natural resources. Mitigation and control measures for these polluting substances tend to be ineffective and inefficient, leading to ecological imbalances in the surrounding natural environment through air emissions, effluent run-off and improper disposal of solid wastes. Environmental damage is also spread through excessive procurement of natural resources which inevitably leads to an amount of spoiling of the environment. Rapid extraction can cause irrevocable changes to the local area where mitigation impacts to reduce the effects are not implemented.

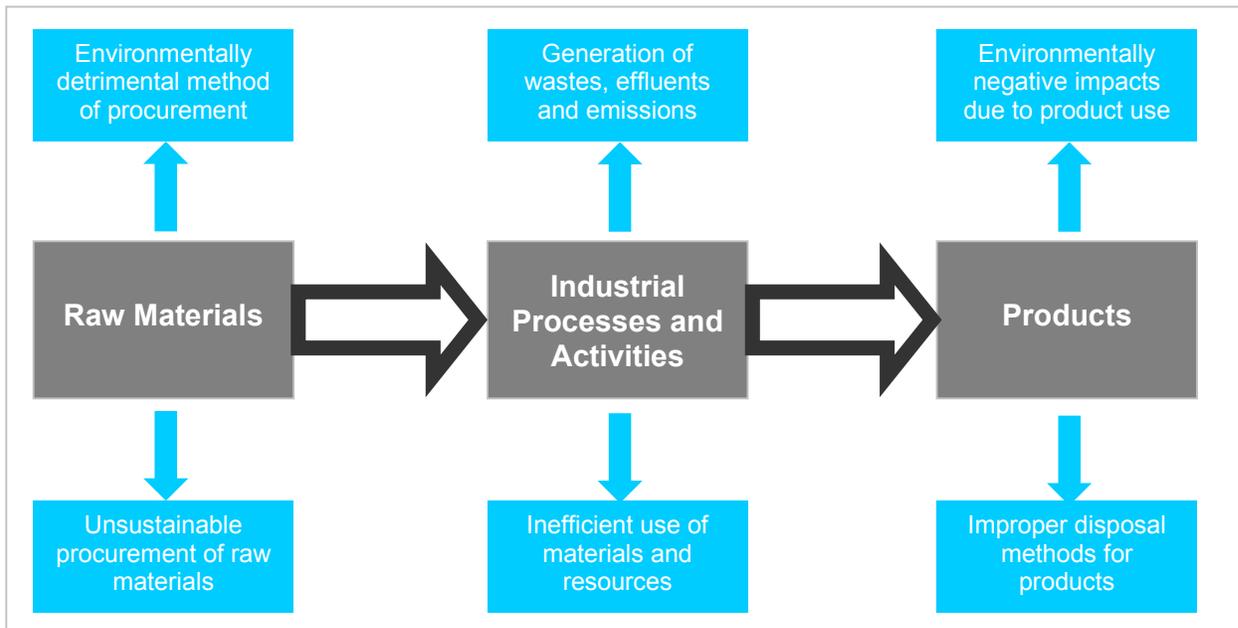


Figure 1: Major Environmental Impacts in the Manufacturing Industry

Industrial Processes and Activities

Industrial processes and activities consume materials and resources for manufacturing products generating emissions, effluents and solid wastes. Finite amounts of natural resources and raw materials used in the manufacturing industry can create resource security issues where the country faces the possibility of exhausting these resources if they are used unsustainably. The need for sustainable consumption of resources by employing efficient industrial processes and activities also helps alleviating the overall environmental impacts of a company by reducing wastage of resources, which directly reduces the production of wastes, emissions and effluents. Pollution control measures have to be incorporated in industrial processes to ensure wastes, emissions and effluents are treated and disposed in a manner to have none or minimal environment impacts at the end of the process.

Product Use and Disposal

The environmental impact during a product's use is determined by the manufacturer, who is directly responsible for polluting effects brought about due to the use of the manufacturer's product. The environmental responsibility of a manufacturing company does not end with the manufacture of a product. Initiatives like the Extended Producer's Responsibility, promoted by the Government of India, have made controlling environmental impacts of a product's disposal a regulatory aspect for manufacturing industries to comply to. Environmentally positive disposal methods stress a focus on the re-use and recycling of the product or its components to reduce direct wastage and use of raw materials.

Consequences of Environmental Impacts

The air, water and land are affected through the environmental impacts created through the operations of manufacturing units.

Air Pollution

Industrial air borne emissions emitted from various industries are a cause of major concern. The primary air pollutants attributed to industry are sulphur dioxide (SO₂), suspended particulate matter (SPM), oxides of nitrogen (NO₂) and greenhouse gases (GHGs). Air emissions are primarily generated through the combustion of fuels for energy production. SO₂ is formed when sulphur-containing fuels like coal and oil are burned. In the same vein, NO₂ and GHG emissions are attributed to fuel combustion for energy generation in motor vehicles, power stations and furnaces. GHGs are also emitted as a result of process-based reactions something that is significant in the Cement and Iron & Steel sectors.

SPMs are generated primarily through smoke from domestic, industrial, and vehicular sources. Monitoring studies show that SPM levels in most urban areas are considerably higher than the acceptable level as per the National Ambient Air Quality Standards. Continuous monitoring of air pollutants has been implemented, with the initial focus on major metro cities, with plans to expand monitoring to the 43 critically polluted clusters identified under the Comprehensive Environmental Pollution Index (CEPI).

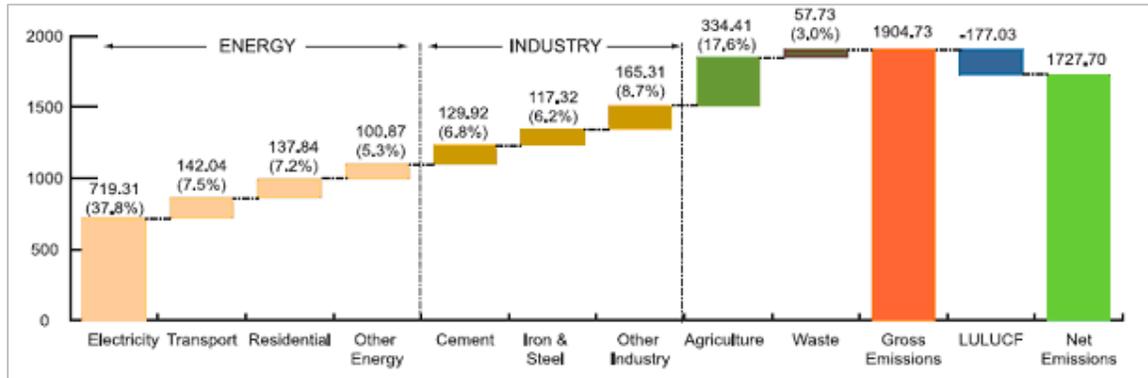


Figure 2: GHG Emissions by sector in India in 2007 (million tons of CO₂ equivalent) Figures on top indicate the emissions by sectors and in brackets indicate % of emission of the category with respect to the net CO₂ equivalent emissions. (LULUCF: GHG removals from changes in forest land, crop land, grass land, etc.)

India has a commitment under the United Nations Framework Convention on Climate Change (UNFCCC) to monitor its complete GHG emissions. The above graph, gives the entire overview of India's GHG emissions in 2007. The GHG emissions from the industry sector amounted to 405.86 million tons of CO₂, 0.15 million tons of CH₄ and 0.21 million tons of NO₂, which amounted to 412.55 million tons of CO₂ equivalent.

Water Security and Pollution

India faces a two-fold issue in water security: decreasing water availability and increasing water pollution in groundwater and surface resources. An increasing population and greater industrial activity is putting pressure on present water sources. Per capita water availability has reduced significantly from 1,816 cubic meters per capita in 2001 to 1,588 cubic metres in 2010. Water resources constitute either of surface water resources and groundwater resources. Surface water resources constitute largely of rivers and lakes, most of which are rain-fed and not perennial throughout the year. As a result, groundwater sources are vital especially during periods of lean rain spells. Replenishment of groundwater sources faces considerable strain without effective measures to assist the regeneration of groundwater sources. To address this, regulatory measures have seen authorities mandating water intensive industries to undertake actions, such as aquifers, to appropriately refill groundwater sources.

Water pollution comes from three main sources: domestic sewage, industrial effluents and run-off from activities such as agriculture. Wastewater from industrial activities is often contaminated with highly toxic organic and inorganic substances, some of which are persistent pollutants and remain in the environment for many years. As per 2009 figures, wastewater generation from industry has been estimated to be 55,000 million m³ per day, of which 68.5 million m³ are dumped directly into

local rivers and streams without prior treatment. The government has given provision for the establishment of Common Effluent Treatment Plants (CETP) during the 11th Year Plan which has been effectively piloted with 142 CETPs set up with government assistance. The CETP scheme can be expected to be expanded further in terms of numbers and technological capabilities to reduce water pollution in the duration of the 12th Five Year Plan and beyond.

Environmental Status of Industries

The Central Pollution Control Board has identified 17 highly polluting industries, the majority of which are manufacturing industries.

S. No.	Industrial Category	Complying	Defaulting	Closed	Total
1	Aluminium	8	-	-	8
2	Cement	175	22	80	277
3	Chlor-Alkali	27	1	4	32
4	Copper	5	-	-	5
5	Distillery	176	29	34	239
6	Dyes and Intermediates	62	3	30	95
7	Fertilizers	79	7	35	121
8	Iron & Steel	56	3	10	69
9	Oil Refineries	19	-	3	22
10	Pesticides	61	18	26	105
11	Petrochemicals	44	1	11	56
12	Pharmaceuticals	291	32	75	398
13	Pulp & Paper	104	33	47	184
14	Sugar	377	69	66	512
15	Tannery	103	8	38	149
16	Power Plant	198	27	19	244
17	Zinc	6	-	-	6
	Total	1791	253	478	2522

Table 2: Status of large and medium industries in 17 highly polluting industrial sectors (as of June 2010)

It is pertinent to mention that the above data reveals that only 71 % of the total industries in the 17 categories have adequate pollution control facilities to ensure compliance with regulations found defaulting with respect to pollution control. The remaining industries have been found to be in non-compliance with regulations mandating pollution technology, out of which 478 units have been closed down, due to ineffective redressal to address the issue of ineffective pollution control technologies.

Although most large industries do comply with regulations as they have the financial capacity to install pollution control technologies, smaller companies tend struggle to achieve conformance with the law. It is imperative to take into account the environmental impacts that occur along a manufacturing organization's upstream and downstream value chain, i.e. its suppliers and buyers, as this does have an impact on the creation of products and services of an organization.

The upstream value chain for a majority of larger manufacturing organizations tends to constitute largely of Micro, Small and Medium Enterprises (MSMEs). MSMEs are an integral part of the Indian industry which contributes 8% of the country's GDP, 45% of the manufactured output and 40% of the country's exports. MSMEs are important for achieving the national objective of growth with equity and inclusion, as they are an integral source of jobs having a much higher labour to capital ratio than in larger industries.

MSMEs can have a significant impact on the environment as they are generally liable to be equipped with obsolete, inefficient and polluting technologies and processes. 70% of the total industrial pollution load of India is attributed to MSMEs. Regulatory mechanisms to ensure compliance are ill-suited towards MSMEs, as they are tailored more towards larger industries, creating a scenario where MSMEs are unable to comply with regulations and wherein regulatory authorities face a difficult situation to close such industries as closure will lead to a drop in production, lead to worker unemployment losing their livelihood, and affect the growth of the manufacturing sector.

New technologies leading to cleaner processes and operations are not proceeding at a fast enough pace to address the urgent need for environmental protection India has recognized. The current ecosystem does not encourage and facilitate the mainstreaming and scaling up of new technologies for widespread use mainly due to a lack of financial support, resources and government assistance. Leveraging various sources of knowledge to create better technology, e.g. educational institutions and manufacturing companies, are almost nonexistent even though the potential impact through such a collaboration would almost certainly lead to mutually beneficial advancements.

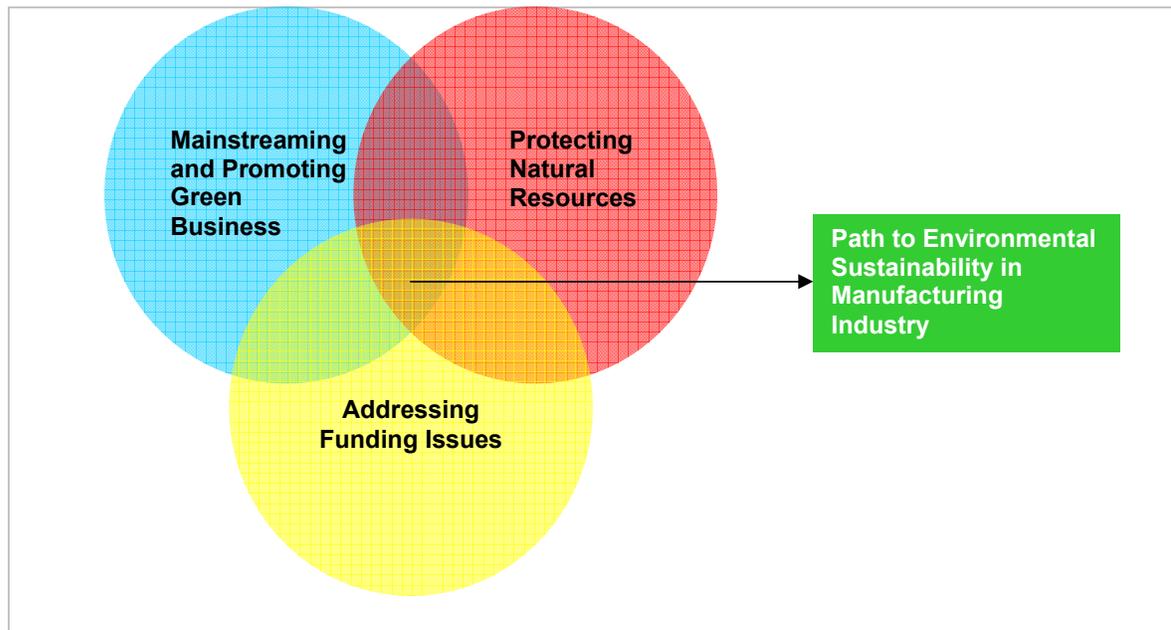
Key Priorities for India in the Next Five Years

By October 2011, India is expected to have a National Manufacturing Policy which will aspire to create 100 million additional jobs in the next 10 years. This aim will be achieved by increasing the Gross Domestic Product (GDP) share of the manufacturing sector from the current level of 16% to 25% by 2025. The country will need to ensure that the environmental impact and effects arising from this increase in manufacturing activities is addressed and controlled without affecting increased industrial growth.

The pressing root causes of environmental issues in the manufacturing industry have been identified previously. The Working Group advocates the need for India to achieve “Rapid Ecologically Sustainable Industrial Growth”, which would require a transformation towards green manufacturing and adoption of environmental sustainability practices by manufacturing companies, and has accordingly identified 3 cross-cutting strategic paths where immediate focus is required to align environmental sustainability within the manufacturing industry:

- **Mainstreaming and promoting green business:** Green business denotes that an organization employs efficient and clean practices, technologies and processes within its operations to lessen its adverse environmental impacts. Green business has to be made attractive. An environment has to be created wherein being green is not viewed as just an obligatory expectation of a company, but as an area of primary focus for the company to develop further and be recognised as a leader. Green business should be good business.
- **Protecting natural resources:** It is a clear understanding that natural resources have to be prolonged to their fullest use to maintain the aim for continual economic growth and lessen environmental impacts. This involves reducing wastage in operations, utilising waste products through recycling and recovery practices to further ensure the long-term availability and usefulness of natural resources.
- **Addressing funding issues:** A major stumbling block on making green business widespread in the manufacturing industry is the lack of financial resources. The primary focuses of funding of the Working Group looks at R&D for developing clean technology and processes and assisting MSMEs, a major source of industrial pollution, to replace existing obsolete and inefficient systems. R&D funding assistance will look at leveraging the knowledge of educational institutions with the experience of manufacturing industries to create technologies

that can be viewed as cutting edge and advanced. MSMEs have limited financial resources and therefore tend to employ cheap yet inefficient technologies that invariably lead to non-compliance with regulations. Funding needs to be made available for assisting MSMEs to implement effective technologies within their own premises and also with building common environmental protection infrastructure within MSME industrial clusters



Under these 3 strategic paths to promote and ensure environmental sustainability in the manufacturing industry, the Working Group has identified 7 recommendation areas with specific strategies and targets:

1. **Green Products:** Promoting and creating market demand for green products, where requirements for a product to be deemed as a green product will be mandated through National Standards on Green Products.
2. **Green Buildings:** Promoting and creating market demand for the construction and utilization of green buildings
3. **Sustainable Environment Management in MSMEs:** Forming tailored and scale-specific compliance mechanisms and measures to ensure compliance in MSMEs
4. **Environmental Regulatory Reforms and Market Based Instruments:** Reforming the environmental regulatory system and mechanism, by strengthening regulatory institutions and existing regulations, and through the formation of new industry focused policies to improve environmental conditions

5. **Organized Waste Management and Recycling Industry:** Promoting a national recycling industry within the currently unorganized recycling sector, with a particular focus on mainstreaming research and design to recycling and recovery technology and mainstreaming them to industry.
6. **Green and Clean Technology Fund:** Formation of green and clean technology fund for funding research and design of green and clean technologies, and promoting green entrepreneurs.
7. **Disclosure on Performance:** Promoting disclosure of the environmental performance of a company, in line with national benchmarks for resource usage and waste generation.

These 7 recommendations tie-in with the 3 strategic paths for environmental sustainability as given below:

Recommendations of Working Group	Strategic Paths for Environmental Sustainability		
	Mainstreaming and Promoting Green Business	Protecting Natural Resources	Addressing Funding Issues
Green Buildings			
Green Products			
Green and Clean Technology Fund			
Environmental Regulatory Reforms and Market Based Instruments			
Organized Waste Management and Recycling Industry			
Sustainable Environment Management in MSMEs			
Disclosure on Performance			

Working Group Recommendations

Section 1: Organized Waste Management and Recycling Industry

Introduction

A consequence of India's higher economic growth is increased consumption of the natural resources and increased waste generation that contributes to ecological degradation, which is estimated at around 5% of India's Gross Domestic Product (GDP). Some of the key areas of waste generation are liquid waste, Industrial waste including hazardous wastes, municipal wastes and e waste.

Recycling of materials is and has been a prevalent and constant activity in India but has been largely confined to the unorganized sector without significant external support to improve and mainstream recycling.

The opportunity and market potential for waste management & recycling in India is very high but can only be achieved through an organized recycling industry driven by proper policy guidance from the Government. Organizing recycling and waste management activities will help to create respectability towards the sector where activities showcasing the potential business opportunities will attract investors and service providers from India and globally to foster support and mainstream recycling and waste management. The integration of the vast workforce presently involved in handling of recycling and waste management in the unorganized sector is essential for the success of the organized waste management and recycling industry, creating inclusive growth.

An organized waste management and recycling sector can lead to:

- Environmental benefits through reduced virgin material consumption, waste generation and waste disposal leading to reduced air, water or land pollution
- Creation of jobs and higher inclusive economic prosperity in the recycling and waste management sector.
- Health & safety impacts to employees arising from recycling and waste management processes will be reduced, where organized activities and operations will facilitate the adoption and integration of cleaner and safer technologies in the sector.

Key Recommendations

To facilitate the creation of an organized waste management and recycling sector, the Working Group has identified the following key recommendations during the period of the 12th Five Year Plan.

National Recycling Program (NRP): The NRP will be an overarching framework to create and mainstream the organized waste management and recycling industry. Under the NRP structured frameworks and guidelines for recycling industry will be developed to integrate it with the existing waste management rules & guidelines. Industry and sector specific recycling standards will be developed under the NRP.

Public - Private Partnerships: Public Private Partnerships to establish facilities for reuse, recycling and reprocessing of wastes from various sectors should be encouraged by providing incentives and ensuring the process for setting up PPP facilities is conducive for widespread implementation

Dumpsites: Development / rehabilitation of dumpsites should be based on scientific assessment of contamination of soil and groundwater and projected future impact based on expected modeling scenarios.

Polluter Pays Principle: A polluter pays principle should be enforced to industries that are non-complying to hazardous waste and chemicals regulations

Research and Development: R&D plays an important role in waste management to identify recycling opportunities and scientific method of waste management. The government should allocate fund for promoting R&D activities in identifying new technologies for waste management & recycling and for scaling up of developed technologies in an industrial context.

Institutional Upgrade: Local institutional bodies must have their capacity built on recycling and waste management, with regards to increase the awareness of practices and technical capacity of recycling and waste management technologies.

Reduced Material Waste Generation: Reduced waste generation should be targeted in a two fold manner of:

- Developing and implementing strategies for their recycle, reuse, and final environmentally benign disposal.
- Promoting biodegradable recyclable substitutes for non-biodegradable materials

Sector Specific Recommendations

Alternate Fuels: At present, annually 50,000 tons (approx) of wastes are used as alternate fuel, which is less than 0.1% of total thermal energy consumption in cements industries in India. The scope to increase this use is extremely high. The usage of high-calorific values wastes (hazardous / non-hazardous) as alternate fuel in cement industries should be promoted and encouraged

Utilization of Non-Hazardous Waste: Non-hazardous wastes, namely fly ash, bottom ash and red mud should be utilized for the manufacture of cement and construction materials.

Stakeholder Engagement

The responsibilities of the various stakeholders for instituting an Organized Waste Management and Recycling Industry are listed below:

Stakeholder	Responsibility
Government	<ul style="list-style-type: none"> ▪ Develop structured framework and guidelines for recycling industry ▪ Develop standards to support recycling & recovery of products ▪ Emphasize the need for strengthening the capacities of local bodies ▪ Promote waste to energy, co-Processing and waste exchange activities ▪ Promote organised recyclers' associations ▪ Encourage R& D in recycling & recovery of material ▪ Increase consumers awareness on 4R (reduce, reuse, recover, recycle) concept
Industry	<ul style="list-style-type: none"> ▪ Practice extended producers' responsibility (EPR) ▪ Invest in developing recovery technologies ▪ Practice co-processing, waste exchange activities ▪ Practice 4R concept – reduce, reuse, recover & recycle ▪ Making India's unique recycling workforce organized
Consumers	<ul style="list-style-type: none"> ▪ Waste management at community level ▪ Opt for recycled / recyclable / bio-degradable products ▪ Participate in extended producers responsibility programs

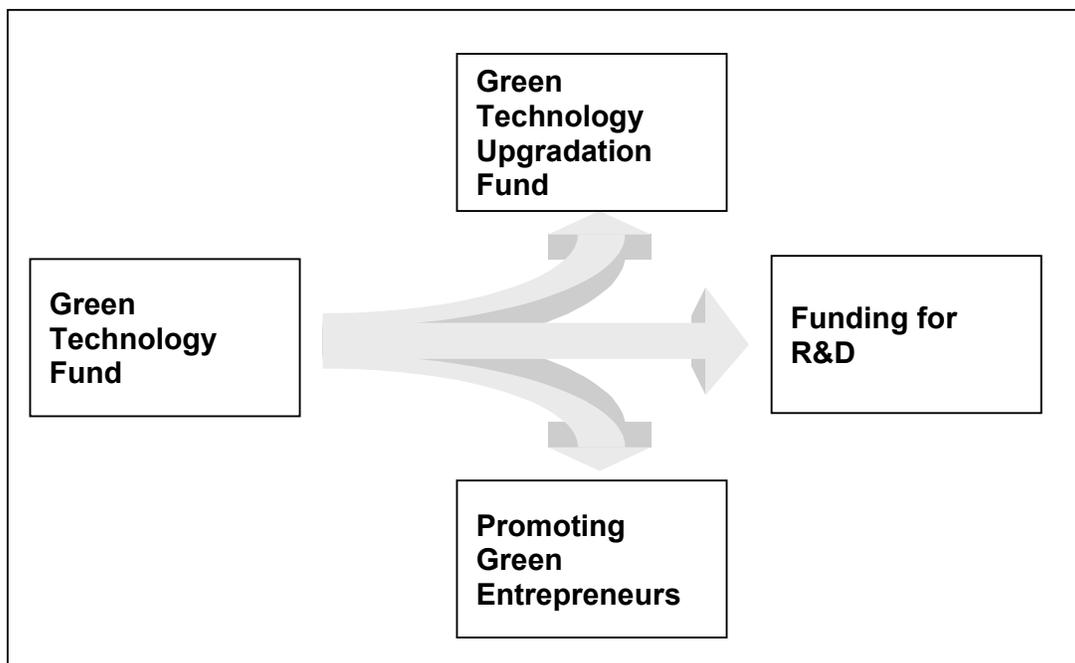
Section 2: Green Technology Fund

Introduction

One of the key drivers for implementing clean & green technology projects in industry is the availability of attractive finance. The government of India has already set up the Clean Energy Fund by levying a 'clean energy tax' of Rs.50 per ton of domestic and imported coal. This fund has been earmarked for developing and implementing clean energy projects.

It is recommended to establish a Green Technology Fund which will support projects, programs, policies and other activities to promote green initiatives in the country. This fund can be in the form of a focused investment vehicle for companies investing in green technology / processes and companies engaged in environmentally supportive businesses such as alternative energy, green transport, water and waste management, and sustainable living. **It is recommended to allocate an amount of Rs. 25,000 crores towards the "Green Technology Fund" over a period of five years.**

It is further suggested that the Green Technology Fund be categorized for use under three approaches. Allocation of this fund for different categories is detailed below:

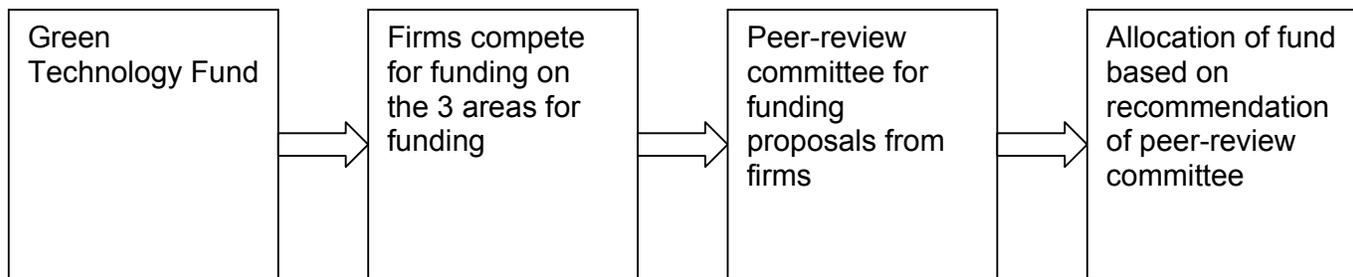


Private investors would seek to appropriate the gains of privately developed technologies which would reduce the potential and viability for such technologies to be implemented in a widespread manner in industry. The development of certain technologies can have a high risk potential and uncertainty on the Return of Investment that deters private players from investing in such technology by themselves.

Public funding would reduce the risk potential and encourage the participation of private investors in supporting the development of new clean technologies and would support societal gains by ensuring mainstreaming and widespread implementation of the developed technologies in industries

Mechanism of Green and Clean Technology Fund

The proposed mechanism for the fund is detailed below:



The Green Technology Fund will be funded by the Government. Firms or individuals will compete for funding as per the 3 areas of funding: **Green Technology Upgradation Fund, Investments in Research & Design, and Green Entrepreneurs**, providing proposals for the activities planned for which funding is required.

A peer-review committee, which should be completely independent and not part of any ministry or the government, will then deliberate on the proposals submitted to finalize the projects for which funding will be allocated.

Funding will be allocated to the selected projects. Private investors may also contribute funds to the selected projects, the amount of which may be capped to a proportion of the entire activity.

Key Recommendations

Recommendation 2.1:

Promotion of Green Technology Upgradation Fund

The Green Technology Upgradation Fund specifically aims at facilitating the implementation of energy efficient & environment friendly processes or equipments. This fund can be disbursed through nodal banks and prime lending agencies. This fund should be available for implementing green technologies in all kinds of industrial sectors.

The approach & methodology of Technology Upgradation Fund (TUF) of the Textile sector, which has been successfully implemented, can be followed in implementing Green Technology Upgradation Fund.

Key activities for promoting Green Technology Fund are:

1. Government to allocate Rs. 15,000 crores (60% of overall fund) over a period of five years for green technology upgradation, out of which 95% will be provided as concessional loan and remaining 5% will be provided as grants for various developmental activities in setting up the fund. Concessional bank loans can be available through a network of nodal banks & financial institutions.

Recommendation 2.2:

Investments in R & D

Investments in R&D are necessary to promote and ensure widespread implementation of Cleaner Production technologies in different sectors, through the allocation of funds from the Green Technology Fund. The funding can be categorized for different activities under R&D based on the sector specific need identification, designation of an appropriate agency for conducting R&D and annual allocation of funds to carry out R&D activities:

Funding to companies can be provided in the form of

- Equity - With an upper limit on the investment amount, with suitable exit clauses
- Grants - In the form of matching grants for industry, with an upper limit on the amount provided, with an optional clause to include academia and/or specific research institutions in project implementation

Key activities for facilitating investments in R&D are:

1. To allocate funds to the extent of Rs. 6,000 crores (25% of overall fund) for R & D related activities over a period of five years. This amount is to be disbursed partially in the forms of equity and grants.

Recommendation 2.3: Promoting Green Entrepreneurs

Green entrepreneurs are those companies that develop technologies and processes that result in cleaner production/ activities. Recent environmental concerns have created a large demand for such ‘green’ products and processes, and consequently, there has been increased investment in green companies.

Key activities for promoting green entrepreneurs:

1. It is recommended to disburse an amount of Rs. 4000 crores for promotion and development of green entrepreneurs, in the form of equity and loan with low interest rate.
2. Allocate about 5% as grants for various developmental programs for promoting Green Entrepreneurs like training & mentoring of identified entrepreneurs etc.
3. Supporting financial incentives and tax benefits may also be given to green entrepreneurs as feasible.

Stakeholder Engagement

The following table outlines the responsibility of each stakeholder (Government, Industry and Consumers) for proper enforcement of Green Technology Fund:

Stakeholder	Responsibility
Government	<ul style="list-style-type: none">▪ Setting up of the Green Technology Fund for clean technologies covering all sectors▪ Concessional bank loans through network of nodal banks & financial institutions▪ Loan or partial risk guarantee schemes▪ Investment in R&D▪ Incentive schemes for Green Entrepreneurs

Stakeholder	Responsibility
Industry	<ul style="list-style-type: none"> ▪ Implementing clean technologies ▪ Green product development ▪ Emphasis on R& D of green products / manufacturing ▪ Support vendor development activities (invest expertise and sometimes capital too)
Financial Institutions (Including Venture Capitals)	<ul style="list-style-type: none"> ▪ Invest risk capital in new green projects/products ▪ Overall financial monitoring and financial impact analysis of supported projects
Consumers	<ul style="list-style-type: none"> ▪ Opt for green (environmentally friendly/ bio-degradable/ recyclable) products ▪ Pursue career in Green jobs

Section 3:

Green Products

Introduction

One of the ways to achieve ecological sustainability in India in a large scale manner is through the promotion of Green Products. Utilizing the power of consumer franchises is the most important way of increasing and mainstreaming the use of green products. Consumers include all market participants like government, industry and domestic consumers, which have the potential to generate strong multiplier effects which will emerge when consumers exercise a preference in favour of an environment friendly product.

Although there have been several criteria proposed to measure 'greenness' of products in different industries, there is no widely accepted global or national standard for defining a product as Green.

Definition of Green Product

Green products are those that have less adverse impact on the environment or are less detrimental to human health and ecology than their traditional equivalents. Green products might typically be produced completely or partially, from recycled components, be manufactured in a more energy & water efficient way, be manufactured with no toxicity in the process or product and be supplied to the market with less packaging. While defining a product on an ecological front, the following are some of the approaches suggested by the Working Group, to define a green/eco-friendly product:

- Any product which has minimal or no impact on the environment based on a Life Cycle Assessment (LCA) study through a Cradle to Grave approach of a product
- Comparison of the environmental performance of a product with National / International benchmarks with its respective product category
- Products which are more water efficient, energy efficient in their use and manufacture (e.g. BEE rated electrical appliances, products marked with carbon / water footprint etc), produced from recycled materials, have no hazardous substances present in the product, utilize a minimum amount of natural resources and being bio-degradable, recyclable / reusable or renewable in nature within a specified time frame.

A product termed as being Green should have a combination of a few or all of the above key characteristics:

It is also to be noted that, the attributes of 'greenness' of a product varies from sector to sector, based upon the materials used / processes adopted while manufacturing. It is the degree of greenness rather than the quantification of attributes which matter for consumers.

Existing Global Standards of Green Products

The suggested index of greenness for few industrial & few consumer products and classification provided by the International Organization for Standardization (ISO) and Asian Productivity Organization (APO) are given below:

Asian Productivity Organization (APO) defines Eco-Product as products and services that comply with environmental regulations and are environment-friendly. It includes not only industrial products but also consumable goods as well as products and services in the areas of agriculture, tourism and finance. A directory namely Eco-Product Directory has been developed by APO; where the products are classified into four categories; materials, components/ spare parts, products and services.

The International Organization for Standardization (ISO) classifies environmental labels into Type I, II and III to describe different types of information schemes for consumers. These schemes are aimed at influencing the consumer decision in favour of greener products.

- Type I is a multi-attribute label developed by a third party
- Type II is (typically) a single-attribute self-declaration developed by the producer
- Type III is a multi-attribute and third-party verified report card with quantitative environmental information based on a life cycle assessment.

Key Recommendations

The following activities will enable the promotion of green products in India:

Framework & Guidelines for promotion of Green products: Government to facilitate promotion of Green Products by developing a framework & guidelines for defining specifications for green products so that the Indian market moves in a more sustainable direction by encouraging the supply and demand of green products. The Ministry of Environment & Forests (MoEF) is currently working on classifying product specifications for specific product categories. This can be used as a platform to develop more green products.

Setting up of Autonomous Body for promotion of Green Products: It is suggested to develop an independent and autonomous body for promotion of “Green Products”. Both industry as well as govt. representatives will be part of the autonomous body. The core purpose of the autonomous body is to promote the manufacturing of Green Products, through implementing the “Green Standards / Guidelines”, as well as periodical review and update the requirements of the standards.

Promoting Green Public Procurement: Government is one of the largest purchasers of consumables and office equipment. The demand for green products can be created through government procurement. The MoEF is already working on developing Green Public Procurement guidelines. Each government department should fix minimum purchase of Green products based on the guidelines.

Promoting Green Products through Voluntary Rating programs: To encourage companies in Green Product Development, it is suggested to promote voluntary rating programs. Government need to support the development of the rating programs, which can be used to convey to the customer a company’s commitment towards environment as well as society. These ratings can be displayed on products and services of the company to help consumers make an informed choice. Existing laboratories / testing labs can be initially used to test various parameters of a product, while certify / rate as “Green Product”. Multiple organizations can be employed to rate a cross section of products.

Government and Industry Associations to take leadership role in promoting Green products: To promote the manufacture, import and export of green products in India, the foremost requirement is the joint effort by Government and Industry Associations to promote green products, assist in developing transparent “Green Standards / Guidelines” and recognize the products with

best environmental performance. The key suggestion is to identify top 100 products and set standards & guidelines for each product. The initial focus for deciding the product categories should be based on most used industrial products having maximum impacts to environment and most used consumer products.

Need Centers of Excellence to promote green products / green process:

There are several Research & Development works happening in pockets across India, mostly in isolation. Central knowledge networking agencies in the form of Centers of Excellence (CoEs) should be set up to develop green products as well as identifying green processes. Existing COEs need to first consolidate all that is happening across the country (can be sector specific) and then work on further knowledge / data enhancement.

Developing Life Cycle Inventory (LCI) data for India: Improving the environmental performance of products, processes and services is creating more business opportunities. Globally industries, regulatory organizations and scientists are getting more familiar with using Life Cycle Assessment (LCA) as a tool to quantify and analyze environmental impacts of technologies, products and services.

To declare a product as “Green Product”, LCA is one of the important tools. However, the present status of LCA in Indian industry is still at a nascent stage and the studies conducted so far are based upon international background data, since India-specific background data for creating scientifically sound Life Cycle Inventories (LCI) is currently not available. As a result, the use of international database to conduct LCA study for an Indian product can lead to inadequate / misleading results. Hence, development of India specific Life Cycle Inventory (LCI) database is need of the hour. It is suggested that Government should support the programs on creating awareness on LCA, as well as developing LCI database. Scheme should also be adopted to provide fiscal incentives to those companies / products, which are using LCA.

Program to promote green entrepreneurs: A front-runner approach should be considered to encourage and promote manufacturers of green products. This will lead the market towards ecologically sustainable growth. Through this approach, green product entrepreneurs will be provided incubation support, IP registration / issues, legal support. Products with the best environmental performance on the market should be identified and their manufacturers recognized. The Government should support programs on accelerating the growth of Green entrepreneurs. The suggested program should address the green business opportunities with skills, talent, technology, markets and money. Government needs to consider the provision of a differentiated and preferential set of incentives (fiscal or financial) to green entrepreneurs.

Export of Green Products: The Government of India has set the ambitious goal of boosting manufacturing as a percentage of India's gross domestic product to 25% from 16%. This will pave the way for the implementation of the new manufacturing drive in the country. As the demand for green products tend to increase multifold both at national and international level, the national manufacturing policy should focus on promoting the export of green products, the potential for which must be jointly explored by the government and industry associations.

National level program to create awareness on Green products: The key suggestion in promoting green products is to enhance and empower the consumers to make informed choice. Consumers need to be made aware of the availability and importance of purchasing green products. This can be built through having an institutional framework & market mechanism that would support the empowerment of consumers.

Stakeholder Analysis

Stakeholder	Responsibility
Government	<ul style="list-style-type: none"> ▪ Developing green standards (focal point for green products) ▪ Creating market demand for green products ▪ Create and operate autonomous body for green product promotion
Industry	<ul style="list-style-type: none"> ▪ Invest in R&D for green products & technology ▪ Cater to market demand for green products ▪ Shift operations towards green processes and technology
Consumers	<ul style="list-style-type: none"> ▪ Government consumers to have fixed percentage of green product procurement ▪ Shift focus to procurement of green products ▪ Participation in green labelling scheme and voluntary ratings scheme for green products

Section 4: Green Buildings

Introduction

India is witnessing tremendous growth in infrastructure development with the construction industry transforming into become one of the largest economic activities in the country in India leading to increased capabilities in buildings, infrastructure development and highway projects. The growth of construction industry provides impetus to other manufacturing sectors like cement, iron & steel, power and chemicals.

As the sector is growing rapidly, preserving the environment poses a variety of challenges yet also presents opportunities for various stakeholders. The construction sector therefore needs to play a responsible role towards preservation of the environment.

The gap between the supply & demand of energy and water is ever increasing. The building sector which is a significant consumer of energy and water can play a vital role in optimizing efficiency and thereby contribute in reducing the impact on natural resources.

Commercial Sector: In the forthcoming years, the major growth in construction sector will be witnessed in residential and commercial sectors at approximately 4 to 5 times the current rate. Demand will continue to grow specifically in the IT, Information Technology Enabled Services (ITES) and Hospitality sectors, but this growth will have significant impacts on natural resources

Residential Sector: Subsequently Indian residential sector has witnessed phenomenal growth over the last 15 years, primarily due to population increase, higher GDP, growing urbanisation, rise in income levels, changes in lifestyle and favorable public policies.

In 1961, the urban population of India was 78.9 million i.e. 18% of the total population. By 2001, it reached 285.5 million i.e. 27.8% of the total population. The urban population is predicted to rise to 550 million by 2030 or 42.0% of the total population. Urban growth combined with rapid growth in the country puts enormous pressure on housing requirements, urban infrastructure and services. The residential sector offers tremendous opportunities to reduce energy & water consumption.

Through the implementation of appropriate codes, standards and policies, it is possible to achieve significant reduction in energy and water consumption in the building sector. The country has already taken initiatives in this path by developing and introducing various standards such as the National Building Code (NBC), Energy Conservation Building Codes (ECBC) and Uniform Plumbing Code of India. The market driven voluntary green building rating programs have significantly transformed the way buildings are designed. Green buildings have the potential to save 40 to 50% energy and 30-40% water vis-à-vis the conventional practices.

With the introduction of the Green Building codes & standards, and the acceptance of the several rating systems for buildings pushing the efficiency bar higher and higher, there is a high and promising potential to reduce the carbon intensity in the building sector.

To translate such opportunities into tangible benefits various interventions will be required:

1. Encouraging public policies
2. Enhancing awareness & capacity building
3. Absorption of new trends & technologies.
4. Develop indigenous standards and codes and facilities for testing & verification.

Along these lines, the Working Group has identified recommendations for Green Buildings as enumerated in the next page.

Key Recommendations

The following activities will enable the promotion of green buildings in India:

- 4.1 Green Building Guidelines:** Minimum Green Building guidelines for all states should be developed for various types of green buildings, i.e. in commercial and residential buildings, which should be aligned with the multiple existing green building ratings systems in India.
- 4.2 Energy Conservation:** For commercial buildings, energy Conservation Building Code (ECBC) shall be made mandatory in all Tier-I cities by 2015; while the code is to be made mandatory all over the country by 2018.
- 4.3 Capacity Building:** Investments in capacity building of green developers, architects, manufacturers, evaluators / assessors is a significant and important factor. Green Building experts such as such as energy modelers, building commissioning agents have to also be developed with capacity building integral to ensure widespread take-up of green buildings. Capacity should be built through awareness workshops and training programs on Green Buildings and include a compulsory disciplinary course on Green Buildings for all architectural and engineering students
- 4.4 Incentives for Green Buildings:** Provide a package of incentives for all green buildings certified under IGBC, LEED, GRIHA or equivalent rating systems. The package may include the following incentives:
 - a. Allowance of high FAR by local municipal bodies
 - b. Easy regulatory clearances
 - c. Concession in property tax
 - d. Reduced bank interest rates and processing fee on loans taken for Green homes
 - e. Reduced power tariff e.g., Rs.0.25/ kWh
- 4.5 Incentives for Green Products and Technologies:** Provide special incentives for green building products & technologies through reductions in sales tax, excise duty and import tax (in case of high end technology machinery) which would facilitate more green products in the market.
- 4.6 Government Take-up of Green Buildings:** All upcoming government buildings to comply with the minimum green building criteria set by existing Green Building ratings systems in India.
- 4.7 Green Cities:** All upcoming new & satellite towns shall be designed as 'Green Cities'.

4.8 Laboratories for Green Building Materials: Accredited testing laboratories & facilities in the country to test green building materials and products should be set up and supported.

Stakeholder Analysis

Stakeholder	Responsibility
Government	<ul style="list-style-type: none"> ▪ Develop minimum Green Building guidelines for all states ▪ ECBC to be made mandatory for commercial buildings in Tier-I cities, by 2015 ▪ Capacity building of Green developers, architects, manufacturers, evaluators / assessors ▪ Provide a package of incentives for all certified green buildings ▪ Provide special incentives for green building products & technologies ▪ All upcoming government buildings to comply with the minimum green building criteria ▪ Develop accredited testing laboratories & facilities to test Green building materials and products ▪ Set-up a nodal agency to certify or rate green building materials and products ▪ All upcoming new & satellite towns shall be designed as 'Green Cities'
Industry	<ul style="list-style-type: none"> ▪ Develop minimum Green Building guidelines for all states ▪ Capacity building of Green developers, architects, manufacturers, evaluators / assessors ▪ Develop accredited testing laboratories & facilities to test Green building materials and products ▪ Design and construct all upcoming buildings as Green Buildings

Section 5: Environmental Regulatory Reforms and Market Based Instruments

Introduction

The 8% compounded annual growth rate of Index of Industrial Production (IIP) during 10th Five Year Plan and the expected high growth rate in the current plan period indicate a robust industrial growth going forward. Further, under the Planning Commission's National Manufacturing Plan it is envisaged to increase the sector's share to 25% of the Gross Domestic Product (GDP) by 2025, indicating a four fold increase from the current base. This rapid industrial growth however takes a significant toll on natural resources along with severe consequences for the environment and the surrounding communities.

The industry and power sector together account for significant share of natural resources - 20% of the fresh water consumption, 650 Million tonnes of coal and 45 million tonne oil equivalent of petroleum and natural gas. It has also led to considerable impact on forests and land-use. Further, the industry releases millions of litres per day of wastewater, causes significant air pollution, solid and hazardous waste disposal, and results in about 65% of the country's net greenhouse gas (GHG) emissions (2007). The extent of aggregate discharge of pollutants has hardly been quantified yet. Thus, the heightened pace of consumption of natural resources as well as the resulting pollution is leading to rapid degradation of the environment and at times a direct conflict with communities.

The pollution control boards are the frontline agency for environmental protection in the country. Their performance will largely determine how successfully India is able to overcome its environmental challenges. But a well-performing board requires a well-designed institutional structure armed with appropriate regulatory tools, clearly defined powers and responsibilities, and adequate resources (financial as well as human) to discharge its responsibilities.

Existing Environment Regulatory system: The environment regulatory institutions [Ministry of Environment and Forests (MoEF), Central/State pollution control boards, State level Environment Impact Assessment Authorities (SEIAAs), etc.] currently suffer from major capacity and resource constraints -- technical, legal, managerial and administrative. The skill sets of the SPCBs remain 'traditional' at best. The focus is on hiring engineers and scientists, while other technically skilled personnel like economists, programme analysts, social scientists, legal consultants, computer

professionals, communication experts, etc are ignored. Further, the boards' capacity has not commensurately increased with the number and variety of industries and the complexities in manufacturing processes.

The SPCBs are facing the problem of inadequate staff amidst an increasing number of industries that need to be regulated. For example, in Karnataka, the number of industries has increased 2.5 times over the five years (2001-02 to 2005-06), while the number of sanctioned posts has gone down from 769 to 675 during the same period.

The **primary responsibility** of the state pollution control boards is extensive monitoring and reporting to ensure compliance with the various environmental laws.

The low ratio of technical staff to the number of industries to be regulated implies that each staff member would be devoting less time monitoring industries as he/she is over-burdened with work. For example, in Gujarat Pollution Control Board, a technical staff had only 1.77 man-days to take care of an industry in one whole year (refer Table 1 below).

The number of days spent per industry by the technical staff in Karnataka and Maharashtra were found equally low at 1.72 and 1.23 man-days, respectively.

State Pollution Control Board	Technical staff		Scientific testing staff		Combined staff
	Number of industries per staff	Number of man-days per industry/ per year	Number of industries per staff	Number of man-days per industry/ per year	Number of industries per technical and scientific staff combined
Gujarat	176	1.77	109	2.87	68
Karnataka	193	1.72	552	0.6	142
Maharashtra	245	1.23	706	0.43	182

Table 1: Average work load of technical and scientific staff (2005-06) *Source: "Turnaround - Reform Agenda for India's environmental regulators" (Centre for Science and Environment, 2009)*

The institutions also lack accountability mechanism and are non-transparent. They operate largely on command and control regime which alone is not sufficient to safeguard the environment and ecological integrity of the country.

Secondly, the existing system of concentration based standards as a means of regulating air and water pollution does not help put a cap on the total pollution from an industry source or a cluster of industries. This most often leads to total pollution loads exceeding the carrying capacities of the environment and therefore, most environment media have pollution levels exceeding the norms. Not having continuous monitoring of key pollutants also hinders implementation of numerous other market based incentive schemes.

Further, no major incentive or disincentive is available for industry to reduce pollution load below the statutes in existing regulatory system. Performance of existing generous upfront tax benefits and capital subsidies has largely been found to be poor. It was estimated by CSE (2011) that the existing scheme of tax benefit through 100% Accelerated Depreciation for pollution control equipments as per Section 32 of Income Tax Act, led to total revenue foregone of Rs. 3000 crore in 2009-10 alone. Present incentive mechanisms based primarily on capital subsidy schemes are not leading to installation of cleaner technologies or improved operational performance.

Weakness in Environmental Clearance process: On the issue of environmental clearance, the current system of environmental clearance [based on Environment Impact Assessment (EIA)] does not take into account the cumulative regional impacts leading to poor environmental and resource planning. The EIA process is not found delivering in entirety because of weak institutional capacity and enforcement mechanism.

Cumulative impact assessment of the regions is missing in EIA reports leading to pollution loads exceeding carrying capacities. This is one of the main reasons for most manufacturing hubs becoming critically polluted. The absence of the regional assessment methodology is also leading to misallocation of precious resources like water. Poor opportunity for public participation during EIA process is also leading to subsequent local conflicts.

In addition, for the EIA process there is no comprehensive system for technology assessment and performance benchmarking while granting approval of upcoming industry units. If manufacturing's share of GDP is to account for 25% by 2025, then the stock of new industrial units will rise 4 fold over existing capacity and form the bulk of the industrial asset base. The asset base should not be encouraged with outdated technology or manufacturing processes.

Poor chemicals management and risk assessment: Old and obsolete chemicals, many of which are toxic are still being used in India without proper identification and approvals.

The present regulatory system under Ministry of Chemicals and Fertilizers principally covers the Indian Chemical Weapons Act 2000. As regards to the licensing policy, chemical products are delicensed except hydrocyanic acid & its derivatives, phosgene & its derivatives, isocyanates & di-isocyanates of hydrocarbons. Under various existing legal instruments inter-alia Environment Protection Act (1986), Insecticides Act (1968), Drugs and Cosmetics Act (1940) and Prevention of Food Adulteration Act (1954), handling and production of certain chemicals are regulated or banned.

Various ministries are currently involved in implementation of respective Acts and Rules related to chemicals management. Presently, 739 chemicals have been compiled by Central Pollution Control Board through the 'Material Safety Data Sheets (MSDS) project' giving details on toxicity and safety information of individual chemicals. This project covers the chemicals listed under 'The Manufacture, Storage and Import of Hazardous Chemicals (MSIHC) Rules 1989, amended in the year 2000 and the Public Liability Insurance Rules 1991.

Despite such isolated initiatives, there is no comprehensive and integrated framework system of identification and inventorisation of the several other thousands of chemicals used, their authorisation and assessment of impact of chemical pollution yet. In particular, the downstream industries or consumers are not fully aware of the risk and/or hazards in using different type of chemical based products.

The land, air, water are being contaminated with continued use of non-approved or obsolete toxic chemicals leading to adverse impacts on human health and ecology.

Key Recommendations

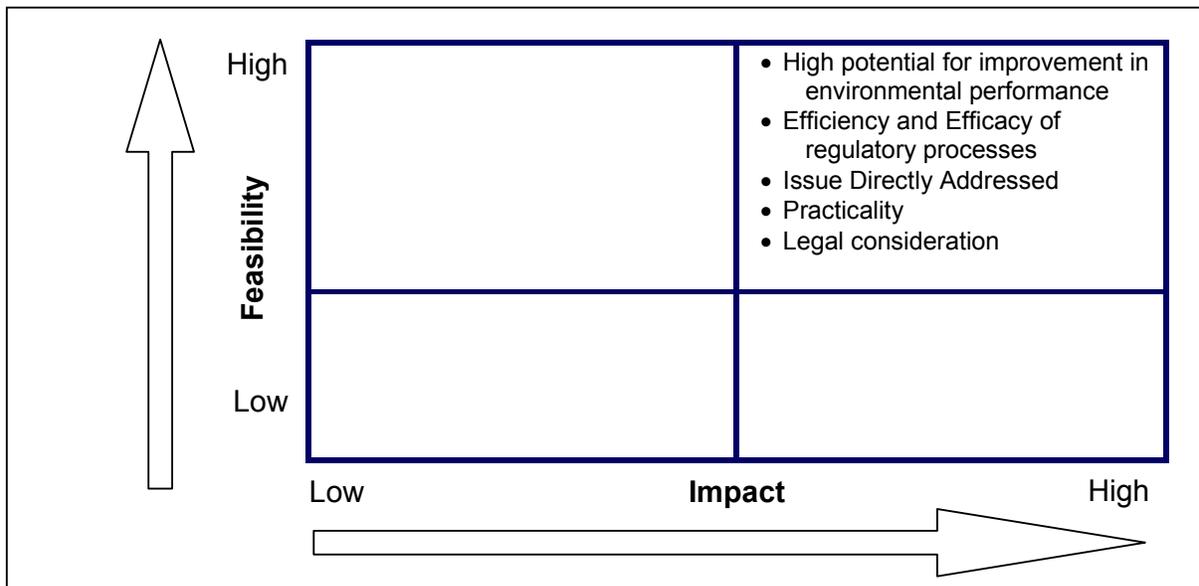
Under Environmental Regulatory Reform, the following three recommendations have been proposed:

- Strengthening regulatory institutions together with bringing institutional reforms such as moving towards load based standards and implementing polluters-pay-principle
- Reforming the existing environmental clearance process for cumulative impact assessment and introducing technology assessment while appraising new projects
- Establishing integrated chemical management policy and regulatory regime

Recommendation 5.1: Strengthening & Reforming Regulatory Institutions

In the short term, independent committee/s to be setup to assess the existing regulatory regime at all levels and recommend legal and institutional reform as well as a detailed agenda for strengthening the institutions. The outcome of the committee’s deliberations should be to develop an action plan for strengthening and reforming the existing regulatory institutions at both the Centre and the state-level during the 12th FYP. In particular, there is a need for introduction of technology to streamline regulatory actions – i.e. **smart regulating mechanisms**.

Feasibility – Impact Analysis



Stakeholder Analysis

Stakeholder	Responsibility
Government	<ul style="list-style-type: none"> ▪ Developing the Action Plan for the institutional reforms and strengthening ▪ Fund the institutional strengthening programme. Funding should be through performance based tools. ▪ Amend laws and establish new or reorient existing institutions
Private Sector	<ul style="list-style-type: none"> ▪ Participate and engage in the entire process
Civil Society and Educational Institutions	<ul style="list-style-type: none"> ▪ Participate and engage in the entire process

Implementation Agenda

Recommendation	Timelines	Resources	Indicators of success
Develop the action plan	March 2013	No major extra budgetary requirement	Development of measurable and monitor-able institutional strengthening action plan for all SPCBs/CPCB/MoEF
Implementation of the action plan	Medium term (12 th FYP duration)	<ul style="list-style-type: none"> ▪ Fund the institutional strengthening programme, funding should be linked with performance based incentives ▪ For funding, most institutions can be self-sufficient from revenues collected by water cess. In future, revenues could be generated from implementation of polluters-pay principle. ▪ For states with fewer industries, central government to support operational expenses. 	<p>Increase in monitoring by 100% by the end of the plan period.</p> <p>Improvement in compliance performance of industries.</p>
Implementation of transparency and accountability charter	April 2014	Improved online information sharing infrastructure	100% online processing of regulatory proceedings and actions with disclosure

Furthermore, two institutional reform measures to be brought about in the 12th FYP are moving towards load based standards and implementing polluters-pay-principle.

Recommendation 5.1a: Moving towards load based standards

There is a need to move towards the existing concentration-based regulation mechanism with load-based regulatory mechanism where every industry is capped on key pollutants released per day and a comparable pollution cap is also put on the industrial cluster.

With improved and cheaper instrumentation and communication technology, it is now practical and appropriate to move towards continuous monitoring to progress towards load-based standards. This mechanism also helps in establishing the

infrastructure base to implement polluters-pay-principle in future. A pollution trading scheme on this system is being piloted in Tamil Nadu presently.

The pollution load-based standards determine and limit the total amount of pollutant generated per day in an industry cluster to ensure a particular quality in the receiving environment media (air/water). The load-based standards then use the quota system for the amount of key pollutant allowed per day for the various industries in the system boundary. Permits are then issued to each industry as per the allowable limit. Against these permits, the individual pollutant released per day is monitored for compliance.

While this system limits the pollution per industry, it does not constrain the production within approved capacities and hence spurs industry to innovate for recycling and waste minimisation. The municipal corporations can also be imposed with load-based standards.

Box-1: Example of load-based standards for industrial clusters

The concept of load based standards requires specifying the caps in the form of Total Maximum Daily Loading (TMDL) into receiving air and water-bodies from all point source discharges falling within system boundary. Regulatory Authority then provides load-based standard permits for different industries based on defined methodology. Each industry must monitor and file discharge reports based on specified formats.

Step-1: Specifying the required Air and Water Quality in the receiving environment media

1a. For Air pollution based on National Ambient Air Quality Guidelines (NAAQ) 2009

Cluster	PM ₁₀	SO ₂	NO ₂	CO
	µg/m ³	µg/m ³	µg/m ³	mg/m ³
Cluster A	100	80	80	2

1b. For Water bodies, the desired quality to be maintained as per minimum quality Class B (outdoor bathing) as prescribed by CPCB (2008)

Cluster	Total coliform organisms	Dissolved oxygen	Biochemical oxygen demand	Nitrogen	Phosphorous
Units	Most Probable Number (MPN)/100 ml	mg/litre	mg/litre	mg/litre	mg/litre
Cluster A	Less than 500	More than 5 mg/litre	Less than 3 mg/ litre	To be defined	To be defined

Box-1 continued:

Step-2 For Air pollution the TMDL can be in the form of kg Particulate Matter (PM)/ day and kg SO₂/ day. Permits are then issued to individual industries on kg/day basis for point sources, after determining load allocation and the margin-of-safety.

Table 2: TMDL and load-based standards for air pollution from all point sources

Cluster name	Category	TMDL for Particulate Matter (PM) in environment kg PM /day	Industry name	Individual load-based standards* kg PM/day (permits)
A	Less critically polluted	5000	Industry#1	2500
			Industry#2	1500
			Industry# 3	1000
			Total	5000
B	Severely polluted	3000	Industry#1	1000
			Industry#2	1500
			Industry# 3	500
			Total	3000

**Non-point sources and margin of safety not shown for simplification*

For effluent discharge pollution, the TMDL can be in the form of kg Biochemical Oxygen Demand (BOD) per day or kg nitrogen per day. Permits are then issued to individual industries on kg/day basis for point sources, after determining load allocation and the margin-of-safety

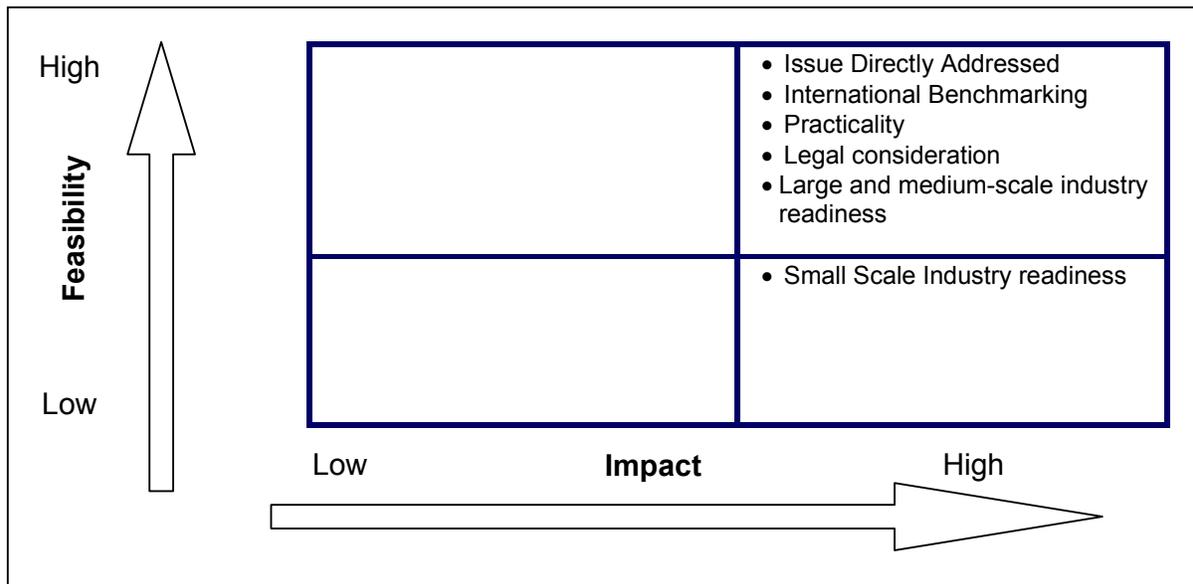
Table 3: TMDL for water pollution from all point sources

Cluster name	Category	TMDL for BOD kg/day	Industry name	Individual load-based standards* kg BOD/day (permits)
A	Severely polluted	500	Industry#1	40
			Industry#2	300
			Industry# n	160
			Total	500
B	Less critically polluted	1000	Industry#1	400
			Industry#2	100
			Industry# 3	500
			Total	1000

**Non-point sources and margin of safety not shown for simplification*

Step-3: When new industries are proposed in the cluster, then the load based standard should be gradually strengthened for accommodating other industries, while maintaining the receiving media environment quality.

Feasibility – Impact Analysis



Stakeholder Analysis

Stakeholder	Responsibility
Government	<ul style="list-style-type: none"> ▪ MOEF/CPCB to develop guidelines on load-based standards in consultation with other ministries, pollution control boards, industries and NGOs. ▪ MoEF to bring out notification ▪ SPCBs to issue Consent to Establish and Consent to Operate, as applicable with load-based standards. ▪ Capacity building for regulators and industries ▪ Compliance assessment and continuous monitoring by SPCBs ▪ Public disclosure of compliance performance and pollution level in the receiving media
Private Sector	<ul style="list-style-type: none"> ▪ Participate and engage in the entire process ▪ Implement continuous monitoring systems in facilities with periodic calibration mechanisms. ▪ Monitoring and reporting of pollutants on regular basis.
Civil Society and Educational Institutions	<ul style="list-style-type: none"> ▪ Participate and engage in the entire process ▪ Scrutinise the environmental performance along with the levels of transparency and accountability

Implementation Agenda

Recommendation	Timelines	Resources	Indicators of success
Develop guidelines for load-based standards	March 2013 (short term)	No major extra budgetary requirement	Guidelines developed and disseminated
Pilot implementation in 10 critically polluted clusters	March 2015 (medium term)	<ul style="list-style-type: none"> ▪ Incentives for financing continuous monitoring in industries to be given ▪ Capacity building for regulators and industries 	Pilot project launch and results monitored and disclosed Capacity building programme organised
Launch nationwide load-based standards	April 2015 (medium term)	Incentives for financing continuous monitoring in industries to be given	Launch of the program

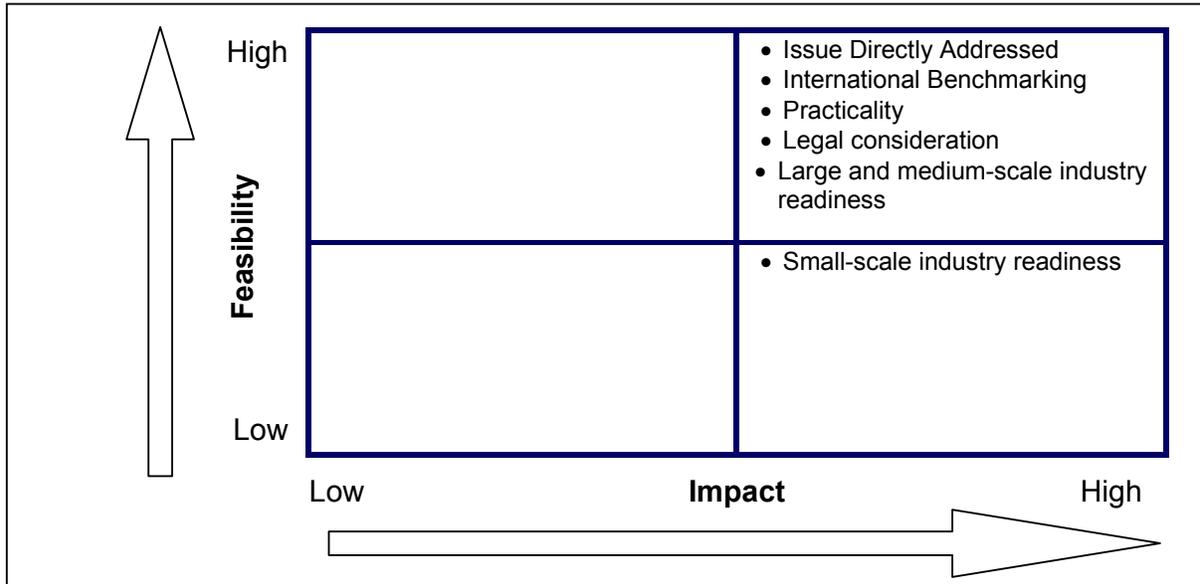
Recommendation 5.1b: Implement polluters-pay principle

Under this regulatory tool, specific pollution loads beyond a defined benchmark should be priced and paid for by industry. Where the pollution load is lower than the benchmark, the industries can be rewarded by **ex-post incentive mechanisms**. The revenue so collected from the implementation of polluters-pay-principle should be used for **environmental protection**, for **meeting the regulatory costs** of institutions and for **setting-up a clean technology fund** for the industries.

The Ministry of Environment and Forests (MoEF) along with pollution control boards will be required to come-out with sector-specific priority pollutants or area-specific priority pollutants to implement the polluters-pay-principle mechanism.

Resources such as fresh water drawal can also be priced at a level which enables innovation in recycling and water conservation. Establishing infrastructure for load-based standards at state/ cluster level is a prerequisite for implementing polluters-pay-principle.

Feasibility – Impact Analysis



Stakeholder Analysis

Stakeholder	Responsibility
Government	<ul style="list-style-type: none"> ▪ MOEF, Pollution Control Boards and Ministry of Finance in consultation with industry and NGOs to develop guidelines for implementing polluters-pay principle ▪ Bring out notification for implementation ▪ Capacity building for industries and regulators ▪ Set-up guidelines for clean technology fund utilisation for continuous monitoring instruments and green technologies
Private Sector	<ul style="list-style-type: none"> ▪ Participate in formulation of the mechanism ▪ Establishing infrastructure for continuous monitoring and reporting at state/ cluster level is essential to implement program.
Civil Society and Educational Institutions	<ul style="list-style-type: none"> ▪ Participate in formulation of the mechanism and engage in the entire process ▪ Scrutinise the implementation of the project for effectiveness, transparency and accountability.

Implementation Agenda

Recommendation	Timelines	Resources	Indicators of success
To develop guidelines for polluters-pay principle, including judicious water pricing	March 2013	No major extra budgetary requirement Establishing infrastructure for load based standards at state/ cluster level is a prerequisite to implement program.	Publishing of guidelines report
Legalisation	Dec 2013	Issue notification	Notification published
Launch nationwide schemes on polluters-pay-principle	March 2014	The revenue generated can be made neutral by setting up clean technology fund for the same sector/ industries.	Launch of the programme

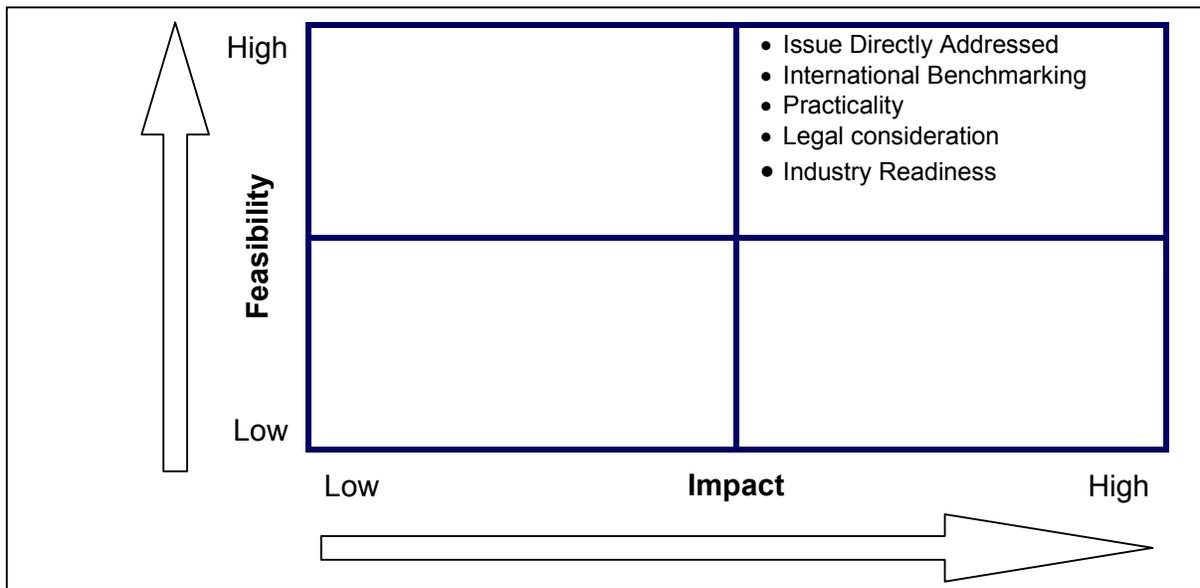
Recommendation 5.2: Reforming Environmental Clearance Process

There is a need to reform and strengthen the current environment clearance process and its enforcement, including the process of public participation, transparency and disclosure. As part of the clearance process, the concept of cumulative impact assessment of the region should be institutionalised.

In particular, capacity building of the institutions involved in the clearance and post-clearance monitoring should be undertaken. The regional impact assessments for major industrial hubs should also be reviewed constantly.

The public participation in the environment clearance process should be strengthened particularly with regard to transparency of decision making and disclosure of information and decisions.

Feasibility – Impact Analysis



Stakeholder Analysis

Stakeholder	Responsibility
Government	<ul style="list-style-type: none"> ▪ Amendments to the EIA notification 2006 ▪ Enhanced capacity for project appraisal and assessment ▪ State pollution control boards to be empowered to do post-clearance monitoring
Private Sector	<ul style="list-style-type: none"> ▪ Participate and engage in the entire process ▪ Capacity enhancement of EIA consultants
Civil Society and Educational Institutions	<ul style="list-style-type: none"> ▪ Participate and engage in the entire process ▪ Public awareness, research and watchdog role

Implementation Agenda

Recommendation	Timelines	Resources	Indicators of success
Amendments to the EIA notification	March 2013 (short term)	No major budgetary implication	Notification issued
Pilot study of regional impact assessments	December 2013	Funds for Undertaking regional impact assessments for major industrial hubs of the country	Report on performance
Capacity building for regional impact assessments	December 2013	Capacity building funds for industries, regulators, EIA consultants etc.	Readiness assessment report
Developing solutions for enhanced disclosure mechanism and public participation systems.	December 2013	Online infrastructure	100% disclosure of updated pollution data
Launch of reformed Environmental Clearance Process	January 2014		Launch of the new process

Recommendation 5.2a: Technology and Performance Assessment during Clearance

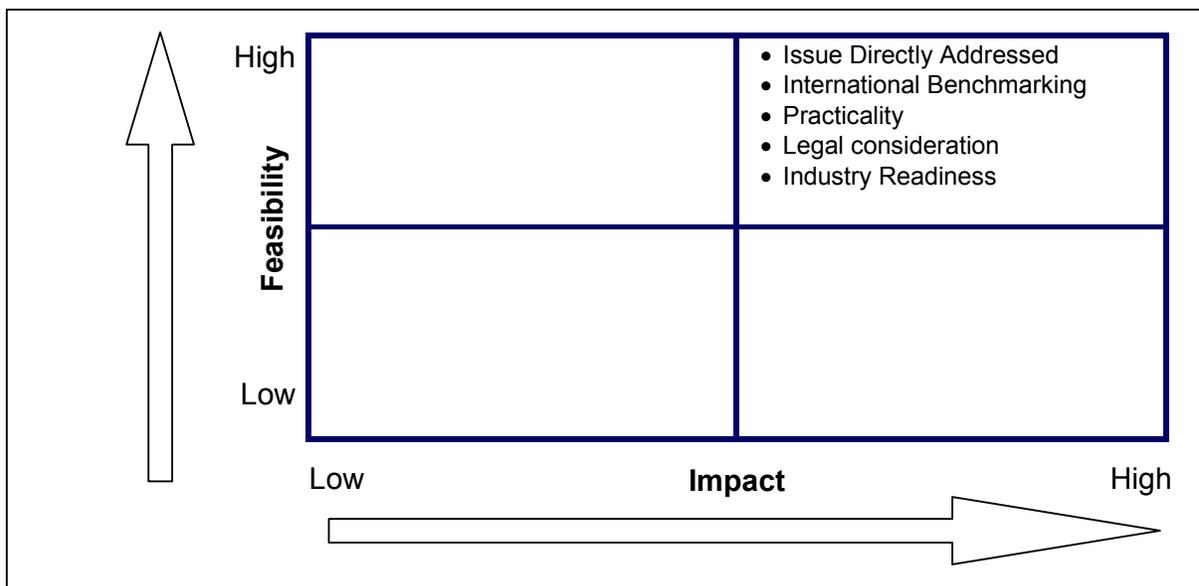
In continuation to the clearance process reforms, the 12th FYP should introduce a system of 'Comprehensive technology and ex-ante performance benchmark assessment' for all major industrial processes. This should be examined as supplement under existing Environment clearance/ EIA mechanism.

The specific input (natural resources such as raw materials, water, land) and output (pollution) performance requirements for new builds will enable industry to choose best practices, improve productivity and avoid locking-in of outdated technologies.

MoEF should prepare guidelines on process types, inputs (specific energy, raw materials, and water), pollution output and waste handling for major industrial processes in consultation with other ministries, governments, industry, educational institutions and NGOs.

As part of this regulatory tool, project developers will be asked to submit technology assessment of their new projects as per guidelines during the appraisal process. The guidelines will have to be updated every three years.

Feasibility – Impact Analysis



Stakeholder Analysis

Stakeholder	Responsibility
Government	<ul style="list-style-type: none"> ▪ Formulate groups to develop guidelines for technology assessment for new industries ▪ Integrate into institutional mechanism for assessment and approval
Private Sector	<ul style="list-style-type: none"> ▪ Help in preparation of technology assessment guidelines for different industrial processes and products
Civil Society and Educational Institutions	<ul style="list-style-type: none"> ▪ Help in preparation of technology assessment guidelines for different industrial processes and products ▪ Participate and engage in the entire process ▪ Public awareness, research and watchdog role

Implementation Agenda:

Recommendation	Timelines	Resources	Indicators of success
Development of guidelines for Technology Assessment as part of Environmental Clearance process	March 2013 (short term)	Budget is required for developing guidelines and setting up institutional mechanism and information disclosure mechanism.	Publishing of the new guidelines
Amendment of the EIA notification	March 2013 (short term)		Notification issued
Launch of the new Technology Assessment as part of Environmental Clearance process	March 2013 (short term)	Capacity building for regulators and industries	Launch of the new process

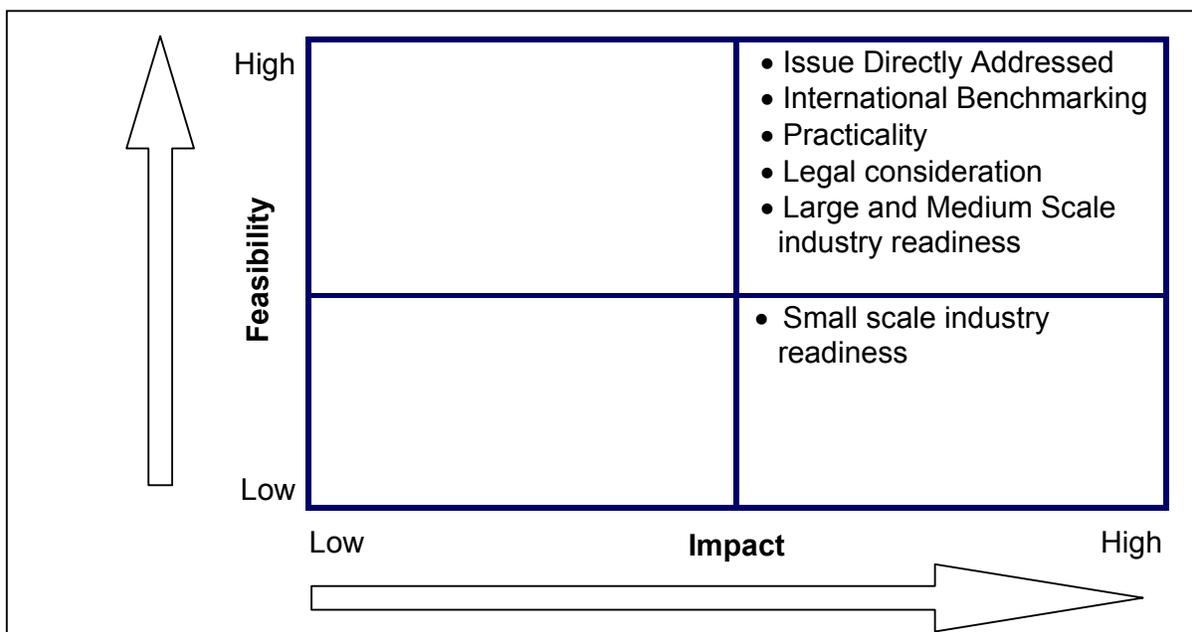
Recommendation 5.3: Integrated Chemical Management Policy and Regulatory Regime

There is a need to set-up a regulatory process to assess all chemicals, register and phase-out toxic chemical products and replace them with non-toxic/less-toxic substitutes. The insights from Registration, Evaluation and Authorization of Chemicals (REACH) programme of the European Union could be of help while developing the framework.

In the short term, the task will be to identify and phase out and ban obsolete or highly polluting chemicals. In the medium and long term, this mechanism will help in promoting and incentivising green chemicals and green chemical industries.

In the 12th Five-year-plan an independent institutional mechanism to evaluate, register and authorise chemicals in the country should be established. Such an institutional mechanism would give boost to the 'green chemistry' in the country.

Feasibility – Impact Analysis



Stakeholder Analysis

Stakeholder	Responsibility
Government	<ul style="list-style-type: none"> ▪ Government to frame policy for integrated chemical management policy in line with EU's Evaluation, Authorization and Restriction of Chemicals (REACH) programme ▪ Harmonisation with global frameworks ▪ Bring out notification ▪ Set-up a regulatory body to identify all chemicals, classify them based on toxicity and impacts.
Private Sector	<ul style="list-style-type: none"> ▪ Help in identification and inventorisation of all chemicals. ▪ Disclosure of all chemicals used in manufacturing and phasing-out banned chemicals. ▪ Research and development on green chemicals
Civil Society and Educational Institutions	<ul style="list-style-type: none"> ▪ Participate and engage in the entire process ▪ Scrutinise the environmental performance along with the levels of transparency and accountability ▪ Creating public awareness ▪ Research and Development on green chemicals

Implementation Agenda

Recommendation	Timelines	Resources	Indicators of success
<p>Establish Integrated chemical management policy and Regulatory Authority to Evaluate, Register and Authorise chemicals by issuing a notification under Environment Protection (EP) Act 1986.</p>	<p>April 2014 (medium term)</p>	<p>Initial funding required from government for:</p> <ul style="list-style-type: none"> ▪ Setting-up institutional mechanism for integrated chemicals management. ▪ Budget for independent testing and assessment of chemicals. <p>Institutional costs can be recovered through charges for testing.</p> <p>Combination of public funding plus regulatory cost recovered from charges can also be conceived.</p>	<p>Notification issued and regulatory body set-up</p>
<p>National Chemical management database set-up</p>	<p>April 2014</p>	<p>Online information infrastructure</p>	<p>Database launched</p>

Recommendation 5.4: Market Based Instruments and Emission Trading

Background

India's rapid growth over the last several decades has brought millions of people out of poverty but also increased strain on the environment. The challenge for government and the private sector is to improve environmental quality without harming output and employment, as the same economic activities that cause pollution – including transport, power generation and industry – have been the engines of growth. Regulatory tools to reconcile growth and environmental quality, in the form of market-based instruments (MBIs) for environmental regulation, have succeeded beyond expectation in the U.S. and other countries but have not been tried in India. Developing these tools further and applying them to India's environmental challenges will be a true societal win-win, reducing pollution while making regulation more reliable and less costly.

The use of MBIs in India is legally and technically feasible and may have a transformative impact by reliably limiting emissions levels and reducing compliance costs. Existing environmental law provides sufficient support to implement emissions trading and other MBIs. The primary obstacle to use of MBIs is introducing more reliable emissions monitoring for total pollutant mass. This obstacle is surmountable, as the private sector has many active vendors for suitable Continuous Emissions Monitoring Systems (CEMS) and the Central and State Pollution Control Boards have lately been developing their own capacity to standardize and roll-out modern monitoring tools.

The impact of MBIs would be far-reaching as they are well-suited to remedy the current difficulties of traditional command-and-control environmental regulation in India. With respect to environmental quality, MBIs such as emissions trading provide a means of reducing emissions load for a whole area, which is what matters for the well-being of its people. In terms of cost, MBIs provide more flexibility in the method of abatement, which lowers compliance costs of industry or other sources. Market-based regulation also encourages greater transparency and accountability for regulators.

This Working Group recommends reforming environmental regulation through use of market-based instruments in general and emission trading in particular. The project has two phases. First, is implementing a pilot emissions trading system to limit particulate matter emissions, which are damaging to public health, in critically polluted industrial areas. Incorporating lessons learned from the pilot, the

recommendation scales the emissions market to address additional pollution problems at the state and national levels.

Three stakeholders will benefit from the use of MBIs, corresponding to the above-noted impacts. The public will benefit from reduced emissions load and greater availability of data about pollution and the workings of environmental regulation. Industry would benefit in having greater flexibility to achieve compliance through the least-cost means of pollution abatement, rather than a fixed technology as under command-and-control regulation. Lastly, environmental regulators at the state and national levels would benefit from adopting modern tools with the potential to set and achieve more ambitious environmental goals in a transparent, reliable manner.

Feasibility and Impact Analysis

This recommendation focuses on designing and deploying an emission trading scheme to control stationary source industrial pollution. Feasibility and impact analysis indicates that such pilots and the larger goal of using market-based instruments to improve environmental quality are both achievable and critically important. The technological and economic expertise for emissions trading either exists or can be developed in India. In particular, emission trading is an appropriate tool to tackle the pressing problem of particulate matter pollution from industry. Particulate monitoring and trading will pose new but surmountable challenges to Indian regulators and industry. Several of these challenges are discussed in Table 1, below, which provides a comprehensive feasibility assessment.

Feasibility Assessment of Emissions Trading

Feasibility Concern	Analysis	Conclusion
<p><i>Legal Considerations:</i> Existing environmental regulations are of the command-and-control type.</p>	<p>Existing environmental regulations may be of a command-and-control type but Indian environmental law gives broad power to regulators. Sub-section(1) and sub-clause (ii), (iii) and (iv) of sub-section(2) of Section 3 of the Environment (Protection) Act, 1986, give the Central Government the power to take measures to protect and improve the environment by planning and executing a nation-wide programme for the prevention, control and abatement of environmental pollution, lay down standards for the quality of environment in its various aspects and lay down standards for emission or discharge of environmental pollutants from various sources. As read with read with sub-rule (3) of rule 5 of the Environment (Protection) Rules, 1986, these powers apply in particular to limiting the net adverse environmental impact of economic activity.</p>	<p>Existing environmental law provides sufficient support to implement emissions trading and other MBIs.</p> <p>Regulatory powers are broad and are not constrained by law to be applied through command and control methods alone.</p>

Feasibility Concern	Analysis	Conclusion
<p><i>Monitoring Technology:</i> Emissions trading requires reliable and high integrity data on emissions.</p>	<p>At present, emissions are monitored manually and at long intervals, providing an incomplete and often inaccurate picture of industry emissions. For emissions trading or other pollution charges it will be necessary to accurately measure the total amount of emissions normally using continuous emissions monitoring systems (CEMS) technology. This is an improvement over status quo but also presents technological challenges. However CEMS technology has been developed for major pollutants (including particulates). Multiple vendors operate in India and hundreds of monitoring analyzers have been sold. CEMS is widely used as a monitoring solution in Europe and the United States. Several states, including Tamil Nadu and Maharashtra, have already made significant steps in mandating CEMS and collecting data from industrial sources.</p>	<p>The widespread adoption of CEMS to support emissions trading is feasible.</p> <p>It is necessary to standardize solutions and data reporting requirements as per the local context and requirements of trading.</p> <p>Pilot implementation of CEMS and Emissions Trading will enable field testing, standards development and regulatory and industry experience.</p>
<p><i>Setting the Cap:</i> The target for aggregate emissions from the sector where trading is introduced must be set to produce reasonable prices and emissions reductions.</p>	<p>Currently regulators have little information about the aggregate emissions load of industrial clusters. Emissions monitoring is infrequent and available administrative data may be incomplete or outdated. However the collection of accurate emissions data through CEMS and surveys of industry abatement cost will enable SPCBs to impose a reasonable cap level while achieving desired emissions reductions.</p>	<p>Setting appropriate caps for total emissions is completely feasible with good monitoring data (see above). These caps can additionally be informed by existing research on overall ambient quality.</p>
<p><i>Practicality and International Benchmarking:</i> Is emissions trading a practical method of regulating air pollutants?</p>	<p>Emissions trading has been used to regulate pollutants in many countries including Canada, Singapore, US, Europe. Nationwide programs to control SO_x and NO_x have had great success at lowering compliance costs and lowering emissions (Stavins 2003,2007). One of the earliest trading programs in particulates was implemented in Chile. While design flaws limited trading in the early implementation, the program met its environmental goal and successfully reduced emissions from regulated sources by 50%. Based on their experience, Chilean authorities plan to expand and improve the particulate trading program and introduce a NO_x trading program (Schreifels 2007).</p>	<p>Emissions trading has been used successfully to regulate air pollutants and have consistently improved environmental outcomes.</p> <p>As with any regulation the right design is necessary to maximize cost savings. Therefore a pilot program is beneficial to fine tune rules.</p>

Feasibility Concern	Analysis	Conclusion
<i>Regulatory Capacity:</i> Are state pollution control boards equipped to implement an emission trading scheme?	State pollution control boards have been found to be greatly strained in implementing the present regulatory framework (Centre for Science and Environment, 2009). The Planning Commission has also found the SPCB performance to be poor ¹ . An emissions trading program will also require capacity building. However once regulators grow experienced with the program, emissions trading requires significantly fewer SPCB resources to successfully oversee.	Implementation of an emissions trading regime is certainly possible for pollution boards. A pilot program on a small scale can additionally provide experience before scaling up.

Table 1: Feasibility Assessment of Emissions Trading

In addition to being feasible however, emissions trading should also have the desired impact. Table 2 summarizes why environmental and regulatory impact is likely to be beneficial under this regulatory regime.

Impact Assessment of Emissions Trading

Emissions Trading Impact	Impact
<i>Environmental Impact:</i> Can emissions trading provide better environmental outcomes in regulation of air pollutants?	<p>Yes. An emissions trading regulatory framework targets the quantity of most importance to human health, namely total emissions in an area. Conversely traditional regulation only places limits on individual industry which does not constrain total emissions in a region. International experience (see Table 1, Stavins 2003 and 2007) points to the practically beneficial environmental outcomes from trading programs and other market based instruments.</p> <p>The basic requirement of an emissions trading program is a cap on total quantity of emissions in a region, based upon better monitoring. Thus regardless of the degree to which actual trading occurs – the environmental objective can be met.</p>
<i>Health Impact:</i> Will there be a direct health benefit from a trading programme for particulates?	<p>Particulate matter is by far the most problematic air pollutant on a national scale, with annual average concentrations of Suspended Particulate Matter (SPM) exceeding the NAAQS in most cities (CPCB, 2006; MoEF 2009).</p> <p>According to the WHO, particulate matter affects more people than any other pollutant and there is no threshold concentration below which no harm to health occurs (WHO, 2008). Chronic exposure to particles, especially fine particles, raises the risk of cardiovascular disease and respiratory disease, such as bronchitis and asthma, and the incidence of lung cancer (WHO, 2008). Even apparently healthy people may have reduced lung function as a result of</p>

¹ <http://planningcommission.nic.in/reports/peoreport/peoevalu/spcbpreface.pdf>

	<p>long-term particulate matter exposure (US EPA, 2008). Particulate matter has been demonstrated to increase mortality for both children and adults, with especially large increases for infants with high exposure during gestation (Chay and Greenstone, 2003; Currie and Walker, 2011; Chen et al., 2010).</p> <p>Thus a market-based scheme that limited particulate emissions and reduced ambient concentrations would have a large impact in improving the health and productivity of Indian citizens.</p>
<p><i>Costs:</i> Can emissions trading lower costs of abatement and regulation?</p>	<p>As discussed above, a fundamental advantage of market based instruments in general (and emissions trading in particular) is that they get closer to achieving least cost abatement of pollution. Emission trading provides greater flexibility to industry thus reducing industry costs and is easier to manage for regulators, thus reducing regulatory costs. A rigorous impact evaluation of the trading pilot will measure the cost advantages of trading relative to command-and-control regulation in practice.</p>
<p><i>Compliance:</i> Will emissions trading encourage greater compliance by industry?</p>	<p>Yes, emissions trading encourages greater compliance by industry.</p> <p>First, by reducing costs of abatement, emissions trading reduces the temptation of industry to avoid compliance and makes it easier to meet requirements.</p> <p>Second, modern market-based instruments are based on transparent financial penalties decided in advance of any violation and founded on more accurate monitoring. The adoption of such a penalty schedule, along with a clear signal by the government in adopting market-based regulations, will therefore encourage greater compliance.</p> <p>Third, emissions trading necessitates more accurate monitoring and modern technology for the same. This makes it significantly harder for industries to avoid detection in case of violation.</p>
<p><i>Extent of benefit from recommendation</i></p>	<p>The best way to demonstrate and measure impact on all aspects is to begin with a carefully designed pilot and scale up following analysis of results. The pilot can be evaluated with scientifically rigorous methods to provide convincing evidence of effectiveness in achieving environmental targets at reduced cost. Such evidence can build support for scaling-up market-based initiatives.</p> <p>Previous trading programmes elsewhere in the world have shown large cost savings (for example 40-50 percent reductions in the US NOx Budget program and estimated US \$ 1 billion for the well known Acid Rain programme).</p>

Table 2: Impact Assessment of Emissions Trading

Detailed Implementation Agenda

Table 3 presents a detailed implementation agenda for the design, implementation and evaluation of emissions trading to control particulate matter emissions.

S.No.	Milestone and Present Status	Projected Completion Date
1	<p>Identify participating state boards for initiation of pilot project in particulate emissions trading. Identify industry clusters for pilot ETS.</p> <p>State Pollution Control Boards of Tamil Nadu, Maharashtra and Gujarat have confirmed interest in participation in pilot projects. Planning activities are ongoing in all states and pilot areas have been identified.</p>	Completed
2	<p>Implement continuous monitoring of particulates in pilot industries.</p> <p>Drafting of standards and specification documents for PM CEMS ongoing. Training workshops in calibration and operation are being organized. Overall the scheme will roll out continuous monitoring systems in a few hundred industries in each state and transmit data to the pollution control boards. The reliability of data will be assessed by developing and applying data validation procedures to the data thus collected.</p> <p><i>Milestone Tracking:</i> Progress will be measured continuously as industries come online and transmit emissions data to the regulator. CEMS installation is expected to occur between January and June 2012.</p>	July 2012
3	<p>Training and Capacity Building of Key Participating Stakeholders</p> <p>A series of training workshops and capacity building measures for state pollution control boards, approved environmental labs, and industry will need to be carried out to ensure familiarity with emissions monitoring requirements, and how to function under an emissions trading regime. These will be conducted by experts in different areas including CEMS technology experts, trading market experts and regulators with international experience in emissions trading schemes.</p> <p><i>Milestone Tracking:</i> The completion of this objective will be measured by successful completion of a sequence of training activities planned as per stakeholder requirements. A few initial workshops and outreach events have been conducted as planned.</p>	Ongoing till December 2012
4	<p>Collection of Emissions Data and Field Test of Monitoring</p> <p>Emissions data will be collected in order to field test systems and to determine actual particulate output from the monitored sources. This will be the first data of its kind available within India and can be used to estimate environmental impact more accurately than before. This data will also be used as an input in determining the total emissions cap and other parameters of the trading program. For instance the emissions cap might be set to achieve a specified percent reduction (at least 10%) from levels existing before the pilot.</p>	July 2012-December 2012

S.No.	Milestone and Present Status	Projected Completion Date
5	<p>Create Pilot Emissions Market</p> <p>The scheme will establish permits to emit as a commodity in demand that trades easily on established Indian commodity exchanges. The scheme will develop a platform to reconcile permit holdings and total emissions in order to determine compliance.</p> <p><i>Milestone Tracking:</i> The completion of this objective will be measured by the fraction of outstanding permits that are traded over the compliance period and whether they are traded at reasonable, positive prices. Compliance will be measured by whether industries hold enough permits to cover all emissions. Intermediate steps towards this objective include the contracting of a vendor to design a permit accounting platform, the design and testing of this platform and the participation of pollution sources in emissions trading.</p>	December 2012
6	<p>Field Surveys and Data Collection</p> <p>Since the pilot is meant as an evaluation and learning tool, detailed field surveys will need to be conducted over the course of the full three year pilot. This includes baseline surveys in early 2012, midline surveys in each state and endline field surveys. These will be used in addition to online monitoring data from the CEMS and trading activity to evaluate the impact of the emission trading regulatory design.</p> <p><i>Milestone Tracking:</i> Progress will be measured by successful completion of scheduled surveys (an initial baseline survey, interim survey and a final endline survey) of all participating industries in the three states along with successful acquisition of monitoring and trading data.</p>	January 2012 – December 2013
7	<p>Document Emission Reductions</p> <p>Emissions will be monitored in real time over the whole pilot period to verify that total particulate load is lower than the levels before the pilot by the target set at the start of the scheme.</p> <p><i>Milestone Tracking:</i> The completion of this objective will be measured by whether total emissions are less than the total emissions cap in both the trading and non-trading groups. The goal of documenting emissions cuts will be with respect to aggregate emissions at source and not with respect to ambient emissions or the emissions of any individual unit.</p>	December 2013
8	<p>Document Cost Savings</p> <p>The scheme will measure industry compliance over two years using semi-annual field surveys of economic and environmental variables at both industries participating in the pilot trading scheme and industries that cannot trade permits.</p> <p><i>Milestone Tracking:</i> The completion of this objective will be measured by whether compliance costs are lower for industries permitted to trade. Compliance costs will be measured with five survey rounds covering both economic variables, such as investment expenditures on pollution abatement and labour costs for pollution abatement and compliance reporting, and engineering measures of abatement, such as boiler efficiency and air pollution control equipment efficiency.</p>	June 2014

S.No.	Milestone and Present Status	Projected Completion Date
9	<p>Publish Detailed Report on Pilot Experience</p> <p>India has other pollutants besides particulate matter that are important problems at local- or state-levels. The lessons from the particulate emissions trading pilot will be compiled to identify strengths and weaknesses of the regulatory mechanism, as well as to identify what other pollution problems are most amenable to the application of such market-based instruments.</p> <p><i>Milestone Tracking:</i> The completion of this objective will be measured by the completion of a detailed report.</p>	December 2014
10	<p>Expand Geographic and Pollutant Scope of Market-Based Instruments</p> <p>Following the pilot, state pollution control boards other than the three pilot participants (TN, MA, GU) may choose to utilize a similar market based approach to regulating particulates or other pollutants. This may follow the recommendations within the detailed pilot report. Effluent trading is an example of a potentially promising application area for trading systems.</p> <p>The MoEF and CPCB may direct state pollution control boards to utilize a similar design to the pilot in industry clusters with a severe or critical particulate pollution problem (as identified through the construction of the CEPI index or other such procedure).</p> <p>SPCBs participating in the initial pilot may choose to expand to other industry clusters or initiate trading markets in other pollutants.</p> <p><i>Milestone Tracking:</i> The preparation time for a new trading market to be set up within a state is likely to be one year or more in the case of state pollution boards with no prior experience. For SPCBs participating in the pilot, the time to scale up may be much shorter.</p> <p>We envisage setting up of at least one emissions market for a pollutant other than particulate matter and expansion of the particulate program to other regions in the pilot SPCBs, <i>conditional on positive pilot experiences.</i></p>	Jan 2015-Dec 2017

Table 3: Detailed Implementation Agenda and Timelines

Stakeholder Analysis

Stakeholder	Responsibility
<p style="text-align: center;">Industry</p>	<p>Industry will be the centre of the project. Industry is responsible for adopting continuous monitoring, reporting data to regulators, participating in emissions markets and, most importantly, achieving emissions cuts. The incentives of industry are directed towards</p> <ul style="list-style-type: none"> ▪ <i>Minimizing costs of compliance with environmental regulations.</i> An emissions trading scheme directly achieves this goal as discussed before. ▪ <i>Maximizing flexibility of pollution management.</i> An emissions trading regime does not specify <i>how</i> industries should reduce emissions, as long as they are able to do so as measured by continuous monitoring. Therefore this regulatory framework provides maximum flexibility to industry. ▪ <i>Improving efficiency.</i> Traditional regulation does not reward innovation and improved efficiency even though this also reduces pollution (for instance by burning less fuel for the same output). An emissions trading scheme directly incentivizes this and can therefore lead to improvements in efficiency.
<p style="text-align: center;">Service Providers</p>	<p>Vendors of continuous emissions monitoring systems and operational support for the same will be crucial in establishing the monitoring regime. Private service providers may also facilitate the development of reporting software and of emissions permit trade. Emissions trading creates a market for modern pollution control and pollution monitoring technologies and in doing so also encourages innovation and improvements in these technologies. Thus a market based regulatory regime is beneficial for providers of such technology but it is also directly beneficial to the environmental cause.</p>
<p style="text-align: center;">Government and Regulators – National Level</p>	<p>The Ministry of Environment & Forests will supervise the introduction of the scheme. The Central Pollution Control Board, within the MoEF, will lead the development of uniform technical standards for continuous monitoring.</p> <ul style="list-style-type: none"> ▪ <i>Balancing economic growth and environmental quality:</i> This is a key objective underlying government policy making. Any regulatory regime that provides win-win solutions, or has the potential to do so, is therefore worth exploring. Emissions trading is one such that directly supports the broad goals of national level environmental policy.

	<ul style="list-style-type: none"> ▪ <i>Independence of Regulation:</i> In recent years a general theme of national environmental policy has been to move towards greater independence of regulatory functions from the Ministry of Environment and Forests. In 2007, a task force of the Planning Commission recommended the setting up of a National Environment Impact Assessment Authority (NEIAA), a statutory body independent of the government (Planning Commission of India 2007). The MoEF has proposed the creation of the National Environment Assessment and Monitoring Authority (NEAMA) in a discussion paper dating to November 2010 (MoEF 2010a). <p>While these initiatives have focused on environmental impact assessment, it is to be recognized that the underlying and highly desirable goal of separating regulatory functions from the political process (MoEF 2010b) is one that market based instruments also encourage. Emissions trading in particular removes the focus of regulation from specific industries and instead requires <i>aggregate</i> pollution to be capped. Compliance is then achieved via a completely autonomous market backed by a technology centric monitoring regime. Therefore it becomes impossible for external pressures to affect enforcement of the rules of the game.</p>
<p style="text-align: center;">Regulators – State Level</p>	<p>The SPCBs are responsible for implementation of an emission trading regime and associated monitoring programs. The incentive of the pollution control boards should be directed towards:</p> <ul style="list-style-type: none"> ▪ Effectively tackling environmental concerns in areas under their jurisdiction. As this recommendation has discussed, market based instruments like emissions trading make this much easier through reducing compliance costs. MBIs may also require fewer human resources to administer than traditional regulation and this will benefit pollution boards. ▪ Obtaining better information on all pollution sources in different regions. Trading requires improved monitoring of emissions and this pre-requisite directly provides information that has hitherto been unavailable to the regulator. <p>Increasing acceptance of restrictions on industry and improving the scientific basis for regulation. Because the cornerstone of an emissions trading scheme is the choice of an appropriate total emissions cap, while leaving individual emissions flexible, there is likely to be much more acceptance of the regulatory standard by industry. In turn, the cap can be directly based on real emissions data as well as informed by other studies of health and ecological impacts of pollution. This means the scientific basis for the regulatory standard is generally more scientific, and therefore less arbitrary. This too increases acceptability.</p>
<p style="text-align: center;">Public</p>	<p>The public is a stakeholder through their benefit from a cleaner environment. Academic and non-governmental organizations may be involved in the study and dissemination of the benefits of the scheme. Continuous emissions monitoring allows scientists to better quantify and model the health impacts of pollution. It also enables the general public to see pollution levels from industry around them and therefore leads directly to better compliance, more transparency and greater public vigilance.</p>

Financial Requirements

The largest single cost in this project is for the installation and maintenance of continuous emissions monitoring systems for industry. This up-front investment in physical infrastructure for the scheme will contribute to more accurate and less costly monitoring of some of the largest polluters in Gujarat, Maharashtra and Tamil Nadu for many years.

It is recommended that monitoring technology for all types of pollutants be made as affordable as possible for industry. Measures to achieve this end may include waiving of applicable taxes and excise duties, as well as direct subsidies to monitoring technology wherever their installation is mandated by the state pollution boards. Special attention should be paid to the case of MSMEs, especially in critically polluted areas, because while they are a significant contributor to pollution taken together, they are individually capital constrained.

Accurate emissions monitoring provides a great service to all stakeholders and enables significantly more informed regulatory measures to be undertaken. Continuous emissions monitoring is essential to quantify and model the health impacts of pollution, as an early warning system, as well as identifying state of the art and 'green' performing industries. It also enables the general public to see pollution levels from industry around them and therefore leads directly to better compliance, more transparency and greater public vigilance.

It is important to stress that many of the most significant benefits of continuous monitoring accrue independently of their use in market based instruments (although MBIs can most effectively leverage better monitoring) and therefore there are very sound arguments for strongly encouraging such technology.

In addition to monitoring technology there is a limited burden on pollution control boards necessary to enhance staff, invest in the data acquisition hardware and software that must accompany online monitoring. While these expenses are not large (of the order of a few crores) given the benefits, and provide capacity that can be used for the monitoring and regulation of multiple pollutants, it is still a burden for pollution boards that may be financially strained and understaffed. It is recommended that one of the focus areas for capacity building funds and programs for the state boards be initiatives that enable the use of better monitoring technologies and learning how to design and implement market based instruments of environmental regulation.

Section 6: Sustainable Environment Management in MSMEs

Introduction

While MSMEs contribute to over 40% to industrial production and over 45% to India's exports, they also account for substantial pollution load of India. However, MSMEs are embedded in the socio-economic-geographical milieu of the country. The environmental problems in MSMEs are not just endogenous- borne out of themselves, but are a result of interplay of the following four major factors:

- a. Societal perspective on environmental issues
- b. Regulatory/ Administrative framework to enforce environmental laws
- c. MSMEs' access to environment friendly technologies and finances to acquire them
- d. Common infrastructure for smooth operation of MSMEs

At a societal level, the indifference towards environmental concerns is palpable. Even the most revered and sacred sites such as the Ganges and other rivers, ponds and temple complexes are treated with complete disregard. The tolerance level of society about environmental degradation is very low and it includes various actors such as public at large, offices, businesses, entrepreneurs and law enforcing agencies.

The attitude to environment management in India is lackadaisical and seen in a narrow context of 'pollution control' and is largely left to the relevant administrative departments who manage it only through legislative enforcement. The ownership of environmental concerns is, therefore, not widely held by several important stakeholders such as the community, public and private institutions.

Secondly, most states have made the legal provisions of pollution control as a tool to generate revenue from industry. There are 'Rate Lists' of many State Pollution Control Boards that run into dozen of pages asking fee on one pretext or another. For example, even for non-polluting industries fee for NoC/consent can be starting @ Rs. 25,000 per year separately for air and water and would increase with investment. Needless to say, the laws as implemented and interpreted in its current context are a significant and detrimental impediment to MSMEs.

There are other factors that exacerbate the problem. Firstly, the current life-style is encouraging more and more consumption of materials and resources, such as energy and plastics, which is seen as a sign of development for a country. Certain public policies are provide incentives for consumption of certain specific products having harmful consequences without effective and relevant measures to reduce these harmful impacts, such as subsidizing diesel leading to increased production of diesel based cars or primary fertilizers encouraging overuse of fertilizer leading to irreparable damage to soil.

An estimated 8% of people are employed in organized sector (including the Government and the Private sector) along with around half of Indian population engaged in agriculture and farming. The rest of the working population is obliged to create employment for itself or get employed with someone who has created an employing opportunity in the form of MSMEs. A vast majority of them are actually self-employed people who survive by producing something or by providing a service.. Estimates² are that more than 90% of them do not have access to any approved developed industrial or business space for work, nor any form of institutional finance nor any government support schemes.

Location has extremely important bearing upon the functioning and working environment in MSMEs. One of the major reasons why majority of MSMEs are un-registered and are unorganized, is because of their inability to access affordable planned industrial space because of which they are compelled to work in 'industrial slums'. Clusters do require a specific type of common infrastructure for treatment of effluents and individual small units cannot afford to set-up such environment friendly processes. In absence of such infrastructure, business activities in the entire cluster can be barred by law as has happened in case of Kolkata (leather and castings), Agra (castings), Kanpur (leather), Tirupur (dyeing) etc. There has been no provision of common infrastructure in most clusters, the provision of which can be looked upon as a responsibility of the local development body. The situation is present all over the country.

² Census of registered and Survey of un-registered MSMEs (2001-02 & 06-07); Report on Unorganized Sector by the National Commission on Enterprises in Unorganized Sector (NCEUS)

Key Recommendations

In view of the contextual needs of MSMEs, the sub-group proposes the following recommendations:

Recommendation 6.1: Regulatory and Administrative

The key points under the recommendation for regulatory and administrative regarding MSMEs are:

- 6.1.1 Change Mandate of Regulatory Bodies:** The mandate of Central and State Pollution Control Boards (CPCBs/ SPCBs) needs to change from 'control of pollution' to 'management of environment' along with advisory & support services.
- 6.1.2 Reconstitution of Regulatory Bodies:** The CPCBs/ SPCBs need be re-constituted to include stakeholders/ Associations. Sector wise product sub-groups need to be formed as part of PCBs. A Grievance Redressal Mechanism should be established at each PCB.
- 6.1.3 Prioritise Regulation Application:** Owing to limitations of resources at the level of PCBs, there is a need to prioritise application of regulations starting with 17 highly polluting industries already identified. Furthermore, State lists may also be revised in consultation with respective industry groups.
- 6.1.4 Advance Ruling:** CPCB/ SPCBs should start the system of giving Advance Ruling on compliance requirements asked by an industry.
- 6.1.5 Action on Violations:** When a violation comes to the notice of the CPCB/ SPCBs, instead of threatening closure, a directive specifying a practical time frame for rectification along with corrective remedies should be prescribed to enable the unit to comply with regulations.
- 6.1.6 Consent Fees:** Fees for providing consent/certifications should be minimal; not a source of revenue. High fee/ charges only help increase corruption.
- 6.1.7 No Objection Certificates Issuance and Renewal:** NoC for non-polluting industries should be without any charge and renewals should be given on the basis of self-certification. Compliance inspection could be delegated to accredited third parties.

6.1.8 MSME focused enforcement regime: As has been pointed out, the MSME context is different and complex. Many a times, MSMEs are not even aware of the regulations when starting an enterprise. Periodically, amnesty schemes could be announced providing a way to willing people to come on board and make their unit compliant. In current dispensation, the longer a unit remains non-compliant willingly or unwillingly, the harder it becomes for it make amends and rejoin mainstream due to fear of penalties.

Recommendation 6.2: Improving MSME access to Clean Technologies

The key points under the recommendation to improve MSMEs' access to environment friendly technologies are:

6.2.1 Technology Support Programmes: The technology/ know-how used in MSMEs is not the creation of MSMEs; it comes embedded with plant and machines they buy. In vast majority of cases, the source remains the domestic suppliers. The technology support programmes should therefore focus on plant and machinery manufacturers to make a larger impact.

6.2.2 Financial Assistance: While access to finance remains a major concern for a sector as a whole, MSMEs encounter greater difficulty in raising finance for buying plants for the purpose of environmental compliances because these might not necessarily contribute to production. There is a genuine fear among MSME entrepreneurs that technological up-gradation costs could render the unit uncompetitive as long as other competitors continue with old cheap methods.

There is a need for detailed study for identification of polluting industries in States and the relevant technological solutions. The Machine manufacturers need to be assisted with prototype developments for environment friendly technologies and bank finance tied up for units to upgrade.

Recommendation 6.3: Creation of common infrastructure for MSMEs in clusters

The key points under the recommendation to create common infrastructure for MSMEs in industrial clusters are:

6.3.1 Central Grant Scheme: There is a need to devise a Comprehensive Central Scheme having grant components for :

- a. Soft infrastructure (for trust building, exposure visits, training etc)
- b. Unit level technology up-gradation assistance (to dovetail with Common Effluent Treatment Plants – (CETPs)
- c. The grant component should cover 50~60% of project cost for CETPs

6.3.2 State Grant Scheme: Complementing scheme of State Governments: To complement the Central scheme, the state governments should come out with a complementary scheme having the following components:

- a. Provision for arranging land for CETPs
- b. Time bound speedy legal clearances
- c. Provision for equity participation in SPVs by SPCBs/ State agencies; Project driver however should be an SPV created by local association (wholly private or having minority equity stake from the State government)

Section 7:

Disclosure on Performance

Introduction

The growing numbers of companies are disclosing their performances in order to become more transparent and accountable to their stakeholders. Some of these disclosures are mandatory i.e. compliance based, for instance, Annual Environmental Statement under EPA and annual financial disclosure under the Corporate Act. As a Corporate seeks foreign investment and more market liquidity in its stock, the Corporate must open its books for better transparency and operations to attract investment sufficient to fund its wider-ranging operations and gain investor confidence. This certainly may have some disadvantage due to the added costs to produce the information and added risks from the public, including competitors for those who are not reporting such as SMEs. Another important aspect of disclosure on performance is the level and desirability of transparency through disclosure acceptable to both the Corporate and the growing awareness of stakeholders, which remains a difficult balance.

Another significant risk and challenge for business is growing activism regarding environmental protection and compliance. Corporate must achieve 100% compliance with environmental laws as well evaluate the cost related to liabilities from actual or threatened legal proceedings, the prospective and material impacts that may result from emerging trends in environmental regulations and developments, if any. Several companies are reluctant to disclose possible environmental problems, fearing protracted and costly litigation and community unrest. However, stakeholders will continue to seek corporate disclosure of activities that impact environmental matters such as global warming, contaminated land, toxic waste, and resource use particularly water and fossil fuels. Further recent introduction of National Green Tribunal by the Government of India will certainly suggest Corporate for better compliance and disclosure.

Indian business case is also a part of the global economy and thus prone to get affected by foreign business dynamics. In case of business compliance to environmental regulation, the system is more vibrant as compared to global scenario. Indian Ministry of Environment & Forests has constituted various regulatory bodies like Central Pollution Control Board (CPCB), at centre and State Pollution Control Boards (SPCBs) in respective states, to monitor and implement the environmental regulatory standards. Under Section 5(a), Environmental Protection

Act has given power to regulatory agencies to issue directions for the closure, prohibition, or regulation of any industry for non compliance.

The companies have to therefore adhere to mandatory disclosure standards and laws, some of them which are included under Environmental Protection Act, 1986 are the Water (Prevention & Control of Pollution) Act, 1974, the Water (Prevention & Control of Pollution) Cess Act, 1977, the Air (Prevention & Control of Pollution) Act, 1981 as well as Environmental Impact Assessment Notification 2006 etc. Regulatory framework is regularly working on improving the existing laws in global business perspective and as a result of which more and more stringent environmental norms are likely to come which will put more financial as well as social burden to business. Therefore the disclosure under compliance to respective laws and regulations itself will not only help business to comply with legislations but also helps for better transparency and gain stakeholders confidence with disclosure.

Voluntary Disclosure on Performance

The increasing trend of the business is now towards voluntary disclosure on environmental performance. Though regulatory compliance is mandatory for companies however, complying and aligning the business to voluntary codes and guidelines are not only in company's own interest to show the commitment but this is need of the sustainable business also. Such endeavors being taken up voluntarily by companies i.e. without any legal binding will certainly raise the stakeholders' interest and confidence. Some of the voluntary codes and guidelines where an organization can disclose, compare and benchmark their sustainability performance are mentioned below.

- **Sustainability Reporting (SR):**

Apart from just reporting on the financial performance, companies are reporting their economic, environmental and social performance, the Triple Bottom Line (TBL) through Sustainability Reporting. There are many consulting organizations and independent think-tanks providing guidelines for reporting but the guidelines provided by Global Reporting Initiative (GRI), The Netherlands, are considered as most comprehensive and widely used for Sustainability disclosure. The Global Reporting initiative is a net work based organization that produces comprehensive sustainability framework that is widely used around the world. About 1800 corporate globally publishes their Sustainability report voluntarily through company's website.

- **Carbon Disclosure Project:**

The Carbon Disclosure Project (**CDP**) is an independent not-for-profit organization holding the largest database of information related to corporate climate change for many organizations across the globe. Various

organizations from across the world's major economies measure and disclose their greenhouse gas emissions, water use and climate change strategies through CDP. In India approximately 100 companies are disclosing their carbon footprints. The transparent voluntary Carbon foot print not only builds brand image and satisfy stakeholders needs, but also bring technological reforms in the operational processes through improving efficiencies including supply chain.

- **The United Nations Global Compact (UNGC):**

The United Nations Global Compact (UNGC) is a strategic policy initiative for businesses that are committed to aligning their sustainability performance with ten universally accepted principles in the areas like human rights, labor practices, environmental protection and anti-corruption. By taking up The Ten Principles, business, as a key driver of globalization, can help ensure that markets, commerce, technology and finance advance in ways that benefit economies and societies everywhere. The Global Compact provides a practical roadmap for the development, implementation, and disclosure of sustainability policies and practices, offering signatory organizations a wide spectrum of work streams, management tools and resources designed to help advance sustainable business models and markets.

- **Voluntary Guidelines on Corporate Social Responsibility:**

Since beginning of last century, the Indian business has traditionally been socially responsible. From inactive philanthropy to the incorporation of the stakeholders' interest in the business model, the Indian business sector practices various methods of discharging its social responsibility. Recently, the Ministry of Corporate Affairs has evolved a set of voluntary guidelines for responsible business which will add value to the operations and contribute towards the long term sustainability. The disclosure through these guidelines will enable business to focus as well as contribute towards the interests of the stakeholders and the society at large.

Key Recommendations

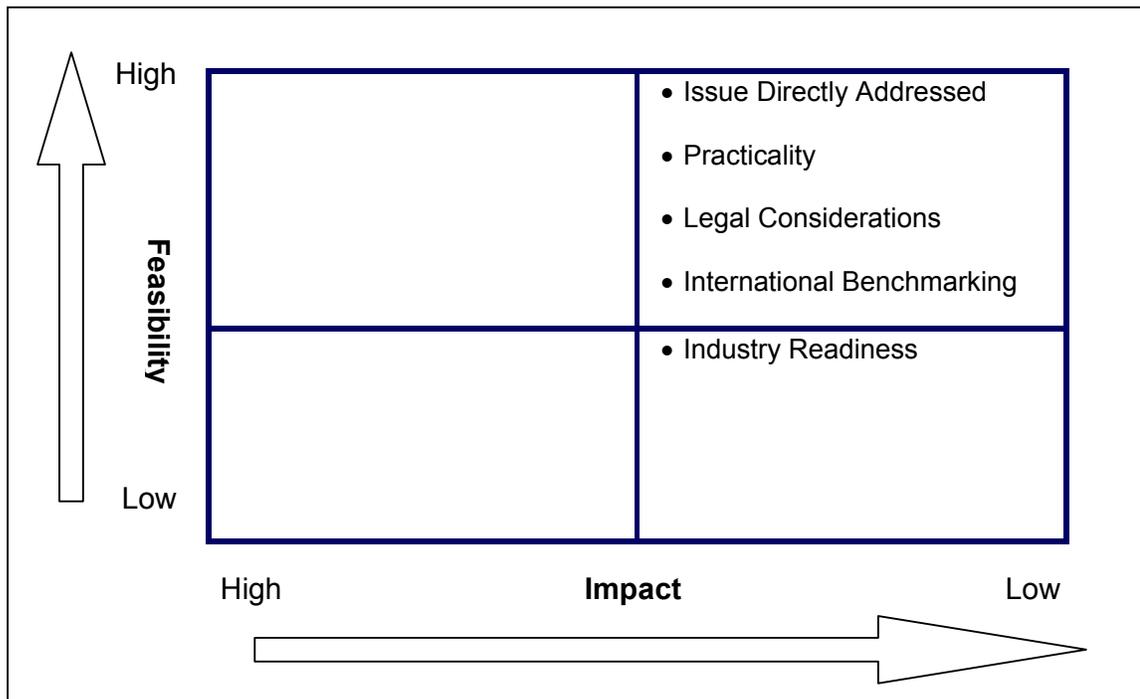
Under Disclosure for Performance, 2 recommendations are being proposed, providing:

- A short term action to increase voluntary disclosure of sustainability environmental performance
- Long term steps to compare sustainability environmental performance of organizations with industry specific benchmarks of consumption of raw materials, energy and water, and generation of wastes, effluents and emissions.

Recommendation 7.1: Incentives for Voluntary Disclosure

There are existing activities for voluntary disclosure of environmental performance based on various guidelines and codes as given previously in the report: the Global Reporting Initiative Guidelines for Sustainability Reporting, Carbon Disclosure Project, Voluntary Guidelines for Corporate Social Responsibility and the United Nations Global Compact. Some Indian organizations do disclose their environmental performance based on some of the above mentioned formats and have established their organizational structure in a manner that supports a disclosure mechanism. The number is not high, and the need therefore is to ensure that disclosure is increased to other organizations. This should not be done through mandatory or regulatory measures but through voluntary incentives such as fiscal and regulatory incentives.

Feasibility – Impact Analysis



Organizations that disclose their performance should be recognized as such and to spread the need for this to other organizations has to be done through incentives. Fiscal incentives are very attractive options for organizations to take up such practices. The fiscal incentives may be aligned based on what an organization discloses.

Organizations that voluntarily disclose their Environmental performance should be provided benefits with regards to consents and approvals such as Consent to Establish, Consents to Operate and Hazardous Waste Authorizations. This should be done by increasing the time period for renewing the consents and authorizations. For example an organization may be granted a 3-5 year extension of their Consent to Operate based on annual disclosure of their environmental performance.

Environmental performance disclosure of an organization may include the following, but not be restricted to:

1. Raw Material Consumption
2. Energy Consumption
3. Water Consumption
4. Emissions, Effluents and Wastes Generated

It should be clearly stated that the disclosure of information follows a recognized and factual guideline or code, such as those mentioned previously.

An important factor is ensuring that the relevant authorities are aware that organizations are disclosing such information. The recommendation states that organizations should provide information that they are disclosing their environmental performance based on particular format in the Environmental Statement that is submitted to the relevant SPCB every 6 months.

Institutional additions to the current regulatory bodies will be required, to handle activities related to Disclosure of Environmental Performance of Organizations such as monitoring disclosures and facilitating the provision of incentives to organizations. Since the recommendation calls for evidence of disclosure to be given in the Environmental Statement the institutional set up may be introduced as a part of the SPCBs or CPCB.

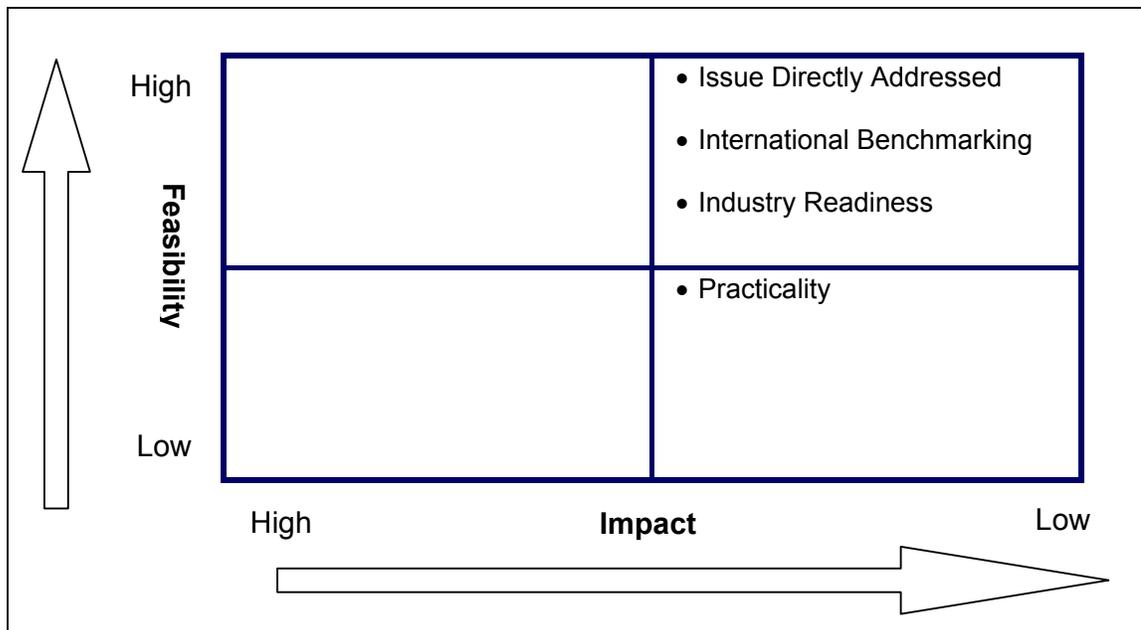
Stakeholder Analysis

Stakeholder	Responsibility
Government	<ul style="list-style-type: none"> ▪ Create a climate to facilitate and expand the voluntary disclosure of environmental performance of organizations as per existing recognized guidelines, providing appropriate fiscal and regulatory incentives. ▪ Create an institutional set up within SPCBs/CPCB to handle activities related to disclosure of environmental performance
Industry	<ul style="list-style-type: none"> ▪ Disclose information on environmental performance as per existing guidelines to show more transparency, accountability and openness to stakeholders, based on voluntary incentives provided
Society	<ul style="list-style-type: none"> ▪ Scrutinise and be aware of organizations environmental performance along with their levels of transparency and accountability
Financial Institutions and Investors	<ul style="list-style-type: none"> ▪ Scrutinise and be aware of organizations environmental performance along with their levels of transparency and accountability for them to have a clear understanding of the organization before investing

Recommendation 7.2: Environmental Sustainability Benchmark Index

The long term initiative under disclosure of performance will be comparing the disclosed environmental performance of an organization with an Environmental Sustainability Benchmark Index that will provide industry specific benchmarks for consumption of natural resources, energy and water, and generation of wastes, effluents and emissions. This is proposed to further utilize the disclosure of an organization's performance to lead to greater benefits of improving performance.

Feasibility – Impact Analysis



The Environmental Sustainability Benchmark Index may be developed along these lines, but with an Indian context on the benchmark figures for consumption for resources and generation of wastes, effluents and emissions. The Index can constitute the following industry specific benchmarks for:

- Consumption of various raw materials
- Energy consumption
- Water consumption
- Generation of emissions
- Generation of effluents
- Generation of wastes (hazardous and non-hazardous)

The Index can be initially tailored to form benchmarks for specific sectors, e.g. the 17 most highly polluting industry sectors as identified by CPCB, and can be progressively expanded to increase the number of industry sectors. Organizations will be judged based on their overall performance to the benchmarks. Organizations that are within the benchmark figures will be applicable to the incentives fiscal and regulatory incentives as described in the first recommendation. Organizations will be judged on 2 factors, whether they are disclosing their environmental performance and the level of their environmental performance based on the disclosure. As such, the incentives must accordingly be more encompassing with greater benefits for organizations, as compared to the incentives that are given under the short term action for Disclosure on Performance.

The institutional set up in Recommendation 1, can be the body that also handles activities relating to the Environment Sustainability Benchmark Index, helping to expand the scope of industry specific benchmarks and managing progressive improvements with regards to the benchmark figures.

Stakeholder Analysis

Stakeholder	Responsibility
Government	<ul style="list-style-type: none"> ▪ Create Environmental Sustainability Benchmark Index with inputs from industry and civil society ▪ Expand institutional set up within SPCBs/CPCB handling activities related to disclosure of environmental performance, to cater for benchmark index
Industry	<ul style="list-style-type: none"> ▪ Provide inputs for formation of Environmental Sustainability Benchmark Index ▪ Align performance with benchmark figures of the Index
Civil Society	<ul style="list-style-type: none"> ▪ Provide inputs for formation of Environmental Sustainability Benchmark Index