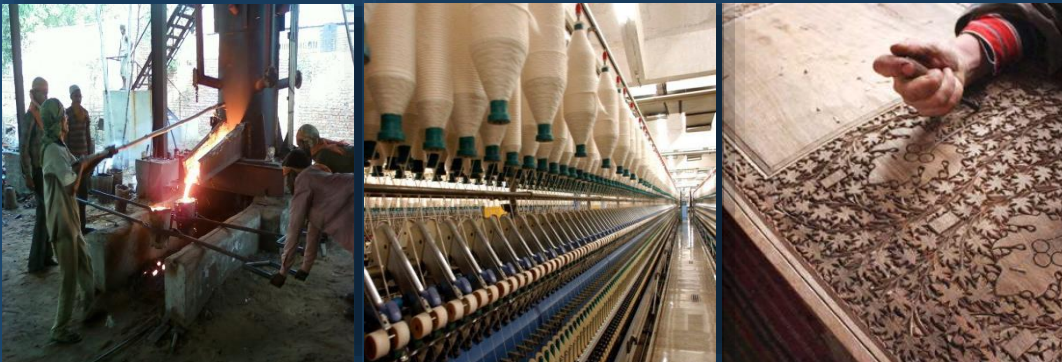




Promoting Sustainable Development of MSMEs - Policy Recommendations on Public Schemes of Assistance & their Implementation



April 2016

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-Policy Recommendations on Public Schemes of Assistance & their
Implementation**

**Foundation for MSME Clusters (FMC)
April 2016**

PREFACE

Sustainability has already taken centre stage of development globally and Govt. of India has made several commitments at national and international platforms. Make in India with Zero Defect & Zero Effect initiatives of the Government express the zeal to balance economic growth with sustainability and social inclusion. All the sectors of economy viz. agriculture, manufacturing and services will need to contribute in this collective endeavour of nation building. With a renewed thrust on making manufacturing significant part of sustainable economic growth, consumption of resources including fossil fuels and primary materials besides social standards assume far more significance than before.



While large enterprises have access to knowledge and resources, it is the micro and small enterprises that together contribute to almost half of the manufacturing output and more than 80% of employment, that development policies have a special role to play. A multipronged approach and involvement of different stakeholders at macro, meso and micro level need to be integrated through convergence of available development resources and coordination among stakeholders. There have been a range of successful initiatives undertaken by several national and international organisations that have provided useful lessons for replication and upscaling. Fortunately, there are already a number of existing technologies, methods and models that are available for various sectors and definitely for those that have been identified as less sustainable. Several new technologies, methods and models need to be developed and sourced for adaptation across sectors and clusters of MSMEs.

The implementation of such scaled up initiatives remains a big challenge with few organisations that must not only have the access to technical knowhow and but also methodologies to ensure that stakeholders can be helped to connect and collaborate wherever needed in order to ensure sustainability as an outcome. A small enterprise mired with several operational and strategic issues with limited human resources needs an integrated support that can only be ensured with convergence of development schemes of assistance and coordination of relevant stakeholders. This document has been prepared to provide strategic direction that our national policy makers can draw upon to strengthen their resolve and implementation mechanisms to ensure sustainability among MSMEs. The recommendations build on successful experiences of different implementing agencies, technical experts and inputs from the policy makers. Various learnings lead us to conclude that we must integrate available inputs with a focus on select less sustainable sectors but targeted on the geographical clusters therein. This will enable mass customization of inputs across different sectors and clusters.

The key to effective implementation of effective & scaled up development initiatives with focus on sustainability lies in our ability to design interventions with convergence from different generically targeted schemes. Second, the implementation will not be meaningful without coordination among regulatory & development policy makers, enterprises & their representative bodies, service providers and banks. We hope that some of the learnings and recommendations will find their way among the well meaning development practitioners, regulators and development policy makers in their ongoing and future endeavours.

A handwritten signature in black ink, appearing to read 'Mukesh Gulati', written in a cursive style.

(MUKESH GULATI)

Executive Director, Foundation for MSME Clusters

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Abbreviations

BKSP	Bangla Swanirvar Karmasansthan Prakalpa
CGTMSE	Credit Guarantee Fund Trust for Micro and Small Enterprises
CLCSS	Credit Linked Capital Subsidy Scheme
CPCB	Central Pollution Control Board
ESI	Employee State Insurance
ESIC	Employee State Insurance Corporation
FMC	Foundation for MSME Clusters
GHG	Green House Gas
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
GoI	Government of India
GVA	Gross Value Added
IPR	Intellectual Property Rights
ISO	International Organization for Standardization
MSE-CDP	Micro & Small Enterprises Cluster Development Programme
MSME	Micro, Small and Medium Enterprises
MUDRA	Micro Units Development & Refinance Agency Ltd.
NIC	National Industrial Classification
NMCP	National Manufacturing Competitiveness Programme
PMEGP	Prime Minister's Employment Generation Programme
RGJAY	Rajiv Gandhi Jeevodayee Arogya Yojana
RIPS	Rajasthan Investment Promotion Scheme
SCP	Sustainable Consumption and Production
SVSKP	Swami Vivekananda Swanirbhar Karmasansthan Prakalpa

CHAPTER I

Introduction

Micro, Small and Medium Enterprises (MSMEs) are a vital part of the India economy by contributing significantly to the economic progression and employment. It contribute 45% of the manufactured output, 40% of its exports and 8% of the country's GDP. It provides employment to more than 60 million people. However, concomitantly, it also contributes to overall industrial pollution. It is estimated that 70% of the total industrial pollution of India is attributed to MSMEs (Working Group Paper, Planning Commission, Twelfth Five Year Plan), "India: Strengthening Institutions for Sustainable Growth, Country Environment Analysis", World Bank, December 2006). The pollution per enterprise of production is higher in select industrial MSME sectors that of the corresponding large enterprises partly due to the use of obsolete technologies and poor management practices, and partly because many of the enterprises escape regulatory ambit (Publication of FMC, "Mapping Energy, Environment and Social Issues among MSME Clusters in India", 2009).

It is estimated that, the industry and power sector together account for a significant share of the country's natural resources viz. 20% of the fresh water consumption, 650 Million tons of coal and 45 million tons' oil equivalent of petroleum and natural gas (Working Group Paper, 12th Five Year Plan, 2012-17). India suffers from decreasing per capita water availability and increasing ground and surface water pollution. Wastewater from industrial activities is often contaminated with highly toxic organic and inorganic substances. As per 2009 figures, wastewater generation from industry has been estimated to be 55,000 million m³ per day, of that 68.5 million m³ are dumped directly into local rivers and streams without prior treatment (Working Group Paper, Planning Commission, Twelfth Plan)

Economic liberalization policies in 1991 triggered the steady growth of industrialization in the country. The MSME sector growth was triggered by conscious developmental support by different Central Ministries/Departments. The Planning Commission has projected a 9.5% growth rate for the manufacturing sector to achieve a GDP growth rate of 9% during the current Twelfth Five Year Plan period. Moreover, under the National Manufacturing Policy announced in 2011 by Government of India, it is envisaged to increase the share of the manufacturing sector to 25% of the Gross Domestic Product (GDP) by 2025, indicating nearly a threefold increase from the current base. It is also envisaged that a 100 million new jobs will be created in this process.

However, this growth though desirable for the economy has brought in its wake a steep increase in the exploitation of natural and non-renewable resources and rising levels of pollution in the form of gases, solid/liquid wastes and e-waste. The damage is already visible and will surely take more severe toll on natural resources along with consequences for the environment and the surrounding

communities in future. Environmental pollution and degradation is likely to continue unabated, unless timely measures are taken.

In the past several years there has been growing global concern with emissions of Green Houses Gases (GHGs), environmental degradation and with the factors leading to climate changes. The focus of attention has been particularly on the contribution of the industrial sector to this degradation. While it has been generally acknowledged that the Millennium Development goals, adopted by the UN in 2000, have achieved many milestones in the global fight against poverty, hunger, and diseases during the last 15 years, there is now a consensus that Millennium Development Goals should be followed by the adoption of Sustainable Development Goals (SDGs). While the specific definitions of Sustainable Development Goals vary, it is generally accepted that they embrace the triple bottom-line approach to human well-being, that is, a combination of economic development, environmental sustainability and social inclusion.

The SDGs came up for discussions during the United Nations Conference on Sustainable Development held in Rio de Janeiro in June 2012 (Rio+20). The UN Sustainable Development Summit in September 2015 in New York, USA adopted the document entitled “Transforming Our World: the 2030 Agenda for Sustainable Development” which set 17 goals for ending poverty and hunger, improving health and education, making cities more sustainable, combating climate change, and protecting oceans and forests.

The United Nations Framework Convention on Climate Change (UNFCCC) has contributed immensely to the understanding of the factors leading to dangerous climate changes around the world. It has been urging the member countries to take urgent measures to protect the Earth’s climate system in accordance with their common but differentiated responsibilities and respective capabilities. The aim of UNFCCC is to stabilize greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the Earth’s climate system and to limit global warming to below 2 degrees relative to the pre-industrial level. The efforts of UNFCCC have been successful in positioning post-2015 Sustainable Development Goals at the centre stage at the United Nations Climate Change Conference slated to take place in Paris in December 2015. It has created a consensus around the world that tackling climate change will only be possible if the SDGs are met; and that development and climate change are inextricably linked, particularly around poverty, gender equality and energy.

China and USA, the two most polluting nations, injected a momentum into the global climate negotiations when their Presidents made a joint announcement in November 2014 of their commitments to take action on issues relating to climate change. USA intends to achieve an economy-wide target of reducing its emissions by 26%-28% below its 2005 level by 2025 and to make best efforts to reduce its emissions by 28%. China intends to achieve the peaking of CO₂ emissions around 2030 and to make best efforts to peak early and intends to increase the share of non-fossil fuels in primary energy consumption to around 20% by 2030.

India, the third highest polluting nation, has announced its targets (known as Intended Nationally Determined Contributions, INDCs) on 2nd October 2015, ahead of the Paris Conference in December 2015. It has pledged to reduce its GHG emission intensity by 33-35 % by 2030 compared to 2005 levels and to ensure that about 40% of its electricity comes from non-fossil fuel sources.

Given the recent announcement of India's commitments to the United Nations on climate change, the concept of Sustainable Consumption & Production (SCP) in the industrial sector assumes immense significance. Government's Policy to promote "Zero Effect, Zero Defect" in manufacturing is also going to draw focus on environmental issues. This policy paper seeks to examine how SCP can be promoted through Government schemes for development of MSME Clusters. It examines the evolution of the concept of SCP, the widely accepted definition of SCP today and its implication for public policy.

This policy paper has been drawn up under the project framework of "Scaling up Sustainable Development of MSME Clusters in India" under the aegis of EU Switch Asia Facility. This paper draws up the experiential learnings and inputs from a wide range of experts and policy makers in this domain. The focus of the paper is to suggest measures that can be undertaken to strengthen the development framework of the Government of India and recommendations on how these could be better implemented. *The objective of the paper is to assess the existing national policy support system and suggest ways to address primarily the sustainable production issues in the broader framework of sustainable consumption and production (SCP).*

CHAPTER II

The Concept of Sustainable Consumption and Production (SCP) in the context of Manufacturing in India

The periodic economic crises of the 21st Century and the long, sustained periods of stagnant or low levels of economic growth in several developed countries and in some developing countries has been a cause of concern among the development policy world. This when coupled with the fact that the growth in global resources is not in keeping with the growth of the world population has brought about a mental shift away from 20th Century consumption-based concepts of economic growth towards sustainability-based concepts of economic development. The accepted approach to expansion had been by encouraging consumption as a means of stimulating the economy and by supporting production.

The emerging image for the 21st Century depicts many more people (9 billion forecasted by the United Nations for 2050 as compared to 6.8 billion in the beginning of the Century) who need to share the world's ever depleting natural resources. This reality of the present Century mandates that there is a significant change in our concept of economic growth i.e. economic growth that is driven not by just ever-increasing levels of consumption and production but by sustainable consumption and production.

The concept of SCP was recognized at the World Summit on Sustainable Development held in Johannesburg in 2002 as an important element of the Johannesburg Plan of Implementation. The World Summit acknowledged that SCP forms one of the three overarching objectives of and essential requirement for sustainable development, together with poverty eradication and the efficient management of natural resources. It was recognized that fundamental changes in the way societies produce and consume are indispensable for achieving global sustainable development. It called for all countries to promote sustainable consumption and production

Sustainable Consumption and Production (SCP) is about “the use of services and related products which respond to basic needs and bring a better quality of life while minimizing the use of natural resources, improving resource efficiency, increasing use of renewable energy resources, reducing release of toxic materials and emissions of waste and pollutants over the life cycle of the service or product so as not to jeopardize the needs of the future generations.” (Oslo Symposium on Sustainable Consumption, 1994).

Sustainable Consumption and Production are both based on certain common premises that are judicious use of available non-renewable resources, minimization of waste and pollution, concept of waste-to-wealth, industrial symbiosis (i.e. utilization of waste of one industry as a resource by other industries, greater use of renewable resources, fuller product life cycles, intra-generational equity and organizational health & safety issues. The concept of green growth, another related term had its origins in the Asia and Pacific Region at a conference held in March 2005 in Seoul where 52 governments and other stakeholders agreed to pursue a path that sought to harmonize economic growth with environmental sustainability, while improving the eco-efficiency of economic growth. In 2008 the concept of green growth emphasised on promotion of renewable energy, carbon capture and sequestration, energy efficiency, clean public transport and rail, improving electrical grid transmission, as well as other public investments and incentives aimed at environmental protection.

To achieve this, it is increasingly recognized that there should be radical shift in thinking and re-designing of products, processes, services etc. to minimize environmental impact from the start. Their aim must be to "leapfrog" over the industrialization patterns and known technologies of the developed world, and to avoid the trap of "growing first, cleaning up later". (“Sustainable Consumption and Production: An Agenda Beyond Sustainable Consumer Procurement”-Doreen Fedrigo and John Hontelez).

In a World Bank report “India: Green Growth-Overcoming Environment Challenges to Promote Development”, March 2014, it is mentioned that a recent survey of 178 countries whose environments were surveyed, India ranked 155th overall and almost last in air pollution exposure. The report concludes that “Poverty remains both a cause and consequence of resource degradation: agricultural yields are lower on degraded lands, and forests and grasslands are depleted as livelihood resources decline. To subsist, the poor are compelled to mine and overuse the limited resources available to them, creating a downward spiral of impoverishment and environmental degradation.”

The Report states that “India will have to meet the challenge of environmental sustainability as it moves along its growth trajectory. It will have to aim at a low-emission, resource-efficient greening of the economy with minimum impact on its GDP growth. India will have to value its natural resources in an appropriate manner so as to take in to account sustainability issues. While calculating its GDP, it will also have to take in to account the impact of pollution on cost of public health and the cost of cleaning up of the environment that has been destroyed in the process of economic development. Conventional measures of GDP growth do not adequately capture the environmental costs. It should develop a Green Development Index.”

To bring about such a major shift in developmental strategies and methods to measure green growth, India’s policy planners and industry would require to take the following measures:

- (i) Substantial step-up in public and private investments in R&D to design and develop new “green products and services”
- (ii) Develop appropriate “green technologies” for their manufacturing.
- (iii) Put in place a mechanism that will ensure that these new technologies are available to the manufacturers, especially the MSMEs, at an affordable cost
- (iv) Extend a package of support and services in an integrated manner to sectoral MSME Clusters to implement green technologies
- (v) Make consumers aware of the benefits of such “green products and services” so that there is increasing demand in the market for them and they get priced appropriately.

The contribution of the manufacturing sector to environmental degradation occurs during three stages viz.

- 1. Procurement and use of natural resources:** During extraction of natural resources, that are used as raw materials, environmental damage often takes place. Mitigating and control measures tend to be ineffective and inefficient. Ecological imbalances in the surrounding natural environment through air emissions, effluent run-off and destruction of soil takes place invariably. There are instances of excessive exploitation of certain non-renewable natural resources, leading to rapid depletion of the resources and, consequently, non-availability of the scarce resources for future use.

2. **Industrial processes and activities:** During the manufacturing process itself, there is often generation of emissions, effluents and solid wastes that damage the environment. There is a need for putting in place industrial processes and activities that reduce waste of resources and minimize, if not eliminate all together, the impact on the environment.
3. **Product use and disposal:** Environmental damage can occur during the consumption or use of the product and when the product is disposed of after use. The responsibility of proper use and disposal of the product lies with the consumer but also with the manufacturer. The concept of Extended Producer's Responsibility (EPR) has been incorporated in the E-Waste Rules by the Ministry of Environment, Forests and Climate Change (MoEF&CC) and is proposed to be incorporated in the Waste Plastic Rules. EPR makes the manufacturer responsible for the environmentally-safe disposal of the final product after use and also for effective re-use or re-cycling of the used product or its components to reduce waste.

To control environmental pollution and degradation, the Central and State Governments have mainly used statutory instruments for laying down environmental standards, limiting expansion of the polluting manufacturing activities or issuing of directions to either close down operations or shift the operations away from human habitation or environmentally-fragile areas. MSME enterprises that do not have the technical, financial or managerial capabilities to comply with statutory pollution norms or to re-locate the enterprises have in some instances, received notices from the local State Pollution Control Boards to close down operations. This has affected production, led to loss of employment and created social unrest in the local areas. The following are some significant examples of adversely affected MSME clusters as brought out by a study conducted by Foundation for MSME Clusters in 2012 entitled "Study on Factors for Employment in MSME Clusters".

Nearly 20 per cent (8 of the 46) clusters surveyed by FMC in 2012, have suffered employment reversals due to pollution (solid/liquid waste emissions) related challenges and the regulatory issues posed by the Government. Among the affected industrial clusters, the impact of pollution on the local environment was severe despite the fact that there were effluent treatment provisions in 5 of the 6 clusters. Again of these 6, while in 2 clusters it has led to closure, in the other 4 it has restricted growth. In Tirupur dyeing cluster, improper effluent treatment technologies in CETPs have led to closure of enterprises due to non-compliance to pollution control norms. Similarly, in Ambur leather cluster, insufficient treatment capacities have led to closure of more than 30 enterprises in the cluster and restrictions on establishment of new enterprises. These have led to a significant fall in employment. Kanpur leather cluster has also experienced negative growth because of the inadequate capacity of existing CETP that can treat less than 30 percent of total effluent output of the cluster.

In the Howrah foundry cluster, restrictions on expansion have been imposed by the State Government in order to keep air pollution levels under control. This has resulted in no new

enterprises being set up in the last 5/6 years and, in fact, has resulted in a number of enterprises being closed down. Similarly, while limited capacity to treat waste in the CETP has restricted expansion of enterprises in the Ahmedabad dyes and intermediaries cluster resulting in stagnation and fall in growth of employment in the cluster, the situation is becoming even alarming due to a “non-committal stance of the State Government”.

Andhra Pradesh is planning to put the industrial enterprises, that currently exist in and around Hyderabad, into multi-purpose commercial spaces by shifting all the polluting manufacturing enterprises away from the urban habitations. The State Government opines that all new enterprises should be established in the 45 zones located outside the ORR (Outer Ring Road). The Bulk Drug Manufacturing MSMEs are threatened with this decision as the shift will cost them badly. Another unique case of regulatory issue, the Sivakasi fireworks cluster that is losing out on growth and employment opportunity because of restriction on expansion by the regulators. Despite the largest producer of fireworks having around 630 licensed enterprises making an annual turnover of around Rs.1500 crores, this cluster is not being able to make any move.

As per the existing regulatory frame-work there is a rigid approach that mandates “Comply or Close Down” that can give way to a more “Comply and Benefit” approach. MSME manufacturing enterprises that fall under the Red Category can be encouraged to develop voluntary benchmarks on sustainability parameters under which there could be five categories in terms of pollution levels namely “Red”, “Orange”, “Amber”, “Yellow” and “Green”.

There are 7 Acts relating to environment protection administered by Ministry of Environment, Forest and Climate Change (MoEF&CC) namely Indian Forest Act, 1927, Wildlife (Protection) Act, 1972, Forest (Conservation Act, 1980, AIR (Prevention and Control) Act, 1981, Water (Prevention and Control of Pollution) Act, 1974, Environment (Protection) Act, 1986 and Water (Prevention and Control of Pollution) Cess Act, 1977. However, under these Acts, there is a veritable labyrinth of rules, regulations, Court rulings and administrative orders. Most MSMEs are not even aware of many of them.

MoEF&CC had set up a High Level Committee under the Chairmanship of T.S.R Subramaniam, former Cabinet Secretary, Government of India, for reviewing and streamlining the legal structure relating to environmental protection. The Committee submitted its report in November 2014. While commenting on the complex framework of laws, rules, regulations, court judgements and administrative orders relating to environment, the High Level Committee had this comment to make “The legislations are weak, monitoring is weaker and enforcement is the weakest”. It found infirmities, inconsistencies and inefficiencies in the administration of laws, rules and regulations that it listed. It highlighted the issues of duplication of work by different authorities; shared jurisdiction; absence of deterrent penal provisions in transgressions; inefficient monitoring in the field; inefficient, flaccid enforcement machinery; non-exhaustive abatement provisions; non-

accountable institutions; weak financial powers; non-professional manpower and limited application of science and technology in the pollution control system. It also found that the process for clearance and approvals of projects was very cumbersome and time-consuming. It further observed, “The lasting impression has remained that the Acts and the appurtenant legal instruments have really served only the purpose of a venal administration at the Centre and the States, to meet rent-seeking propensity at all levels”.

In view of these findings of the High Level Committee, there is, evidently, a strong case for a serious review of the entire legal structure relating to environmental protection and reduction/elimination of pollution and for an urgent overhauling of the administrative structure for implementing these laws, rules and regulations. A simple and enforceable legal framework and efficient administrative structure are essential for high level of compliance by all stakeholders, including MSMEs. This however cannot be undertaken effectively without linkages with other public and private sector stakeholders and in particular the development framework.

CHAPTER III

Analysis of the Public Schemes of Assistance and their usage in the context of SCP

In light of the objective of the paper that aims to assess the existing national policy support system and suggest ways to address primarily sustainable production issues, an analysis of the available public schemes of assistance was considered important. The paper identified the available public schemes assistance across relevant ministries of the Govt. of India as they existed in October 2015. A total of 205 public schemes of assistance were then identified through web based search building on the information contained on the websites of different ministries. The Twelfth Five Year Plan document, Central Government Budget documents, the approved Budget documents, Outcome Budgets and the Annual Reports of the concerned Ministries/Departments of Government of India were also consulted. Subsequently field level surveys were conducted to capture the perspectives of the intended 154 beneficiaries through structured questionnaires. Personal meetings and interviews followed this with leaders of industry associations, technical experts in different fields and policy makers.

Before taking up the analysis of 205 schemes from the point of view of SCP, it was necessary to identify the essential elements in the schemes that are identifiable. In other words, what should be the yardstick to determine if any particular Government scheme for MSME development has a component of SCP embedded in it? Some of the elements of sustainability that have been considered while analysing existing Government schemes for MSMEs from the point of promoting sustainability are the following:

- 1) Energy efficiency
- 2) Increasing use of new and renewable energy

- 3) Waste minimization
- 4) Effective control and management of waste
- 5) Beneficial uses of waste
- 6) Reduction of air, water, soil pollution
- 7) SCP-oriented financing or Green financing
- 8) Occupational Health and Safety (OHS)
- 9) Use of ICT in manufacturing for enhancing productivity
- 10) Skill up-gradation of workers especially from SCP angle
- 11) Creating awareness amongst managers of the benefits of SCP
- 12) Investment in R & D for developing green technologies
- 13) Marketing of Green Products
- 14) Integrated and Aggregate Reporting

The 205 public schemes assistance from among different Ministries and Departments of the Govt. of India are listed at www.clusterobservatory.in . All these schemes relate to MSME sector development. These schemes were analysed from the perspective of the thematic areas that they supported. These thematic areas are entrepreneurship development, infrastructure development, skill development, technology up-gradation, promotion of R&D, occupational health and safety (OHS), marketing, institutional credit, financial support (subsidies, margin money support) and energy and environment. (See Figure 1 below) This analysis has facilitated identifying those schemes that have an in-built component of SCP (Part I) and those schemes that presently do not have an element of SCP but there is scope to incorporate such an element in these schemes through appropriate restructuring (Part II).

These schemes have been analyzed and divided into 4 broad categories of services as depicted in **figure-1** for all thematic areas together and in **figure-2** for various thematic areas separately. Here the number of schemes are not unique numbers. One scheme can have multiple components and thus there is considerable over-lapping, with schemes falling in more than one thematic category. An analysis of these 205 schemes shows that on the basis of the services offered by them, they can be broadly categorized in to 4 categories:

- 1) Information dissemination** through organizing seminar, workshops, exposure visits, etc.
- 2) Financial support for studies and R&D**, like supporting feasibility studies, need/gap assessments, R&D projects etc.
- 3) Skill development/ up-gradation** (technical, non-technical skills) through training and capacity building; and
- 4) Support implementation** by providing direct or indirect financial or tangible (hard activities) support.

Figure 1: Thematic Distribution of Public Support Schemes

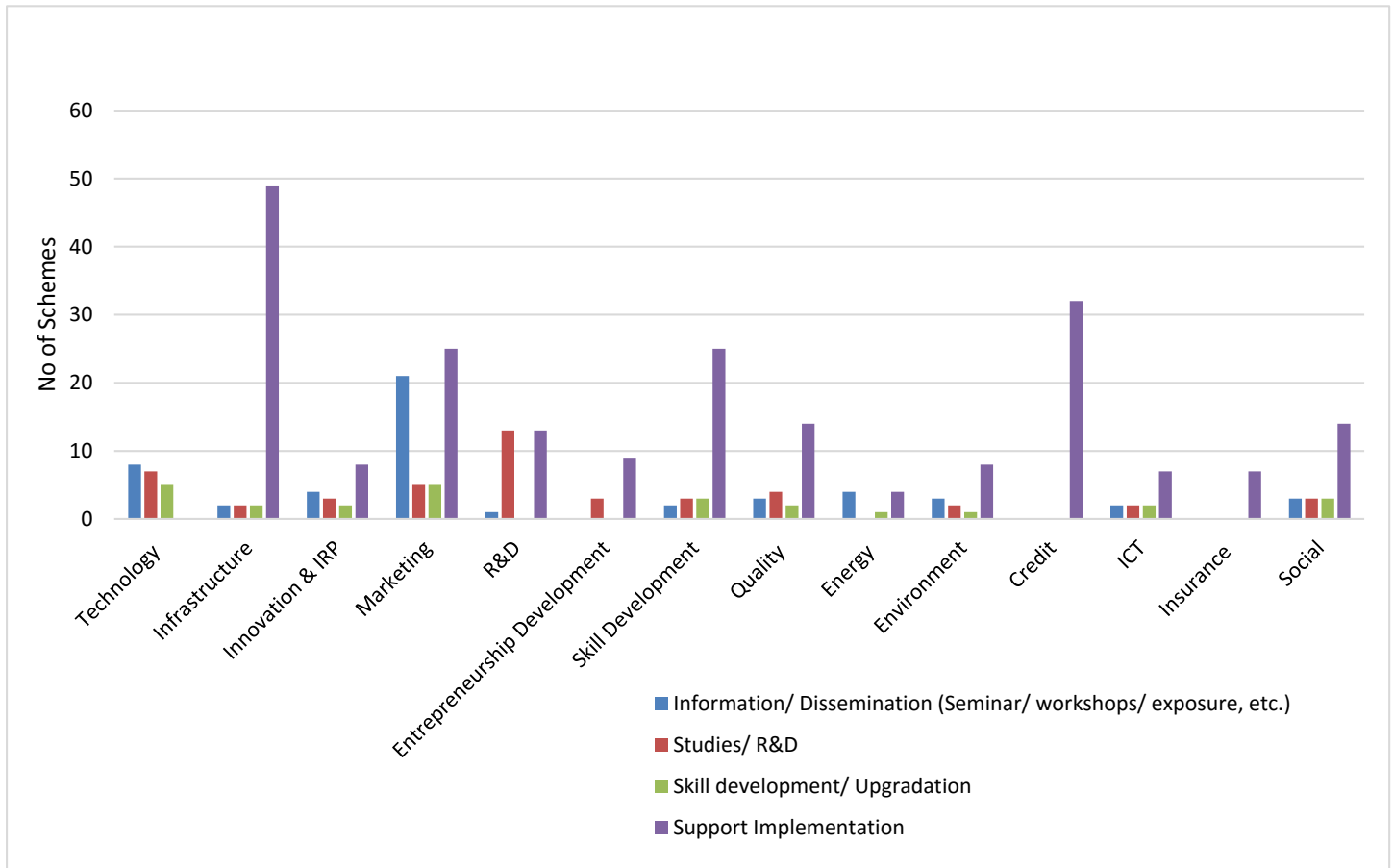


Figure 2: Types of Support

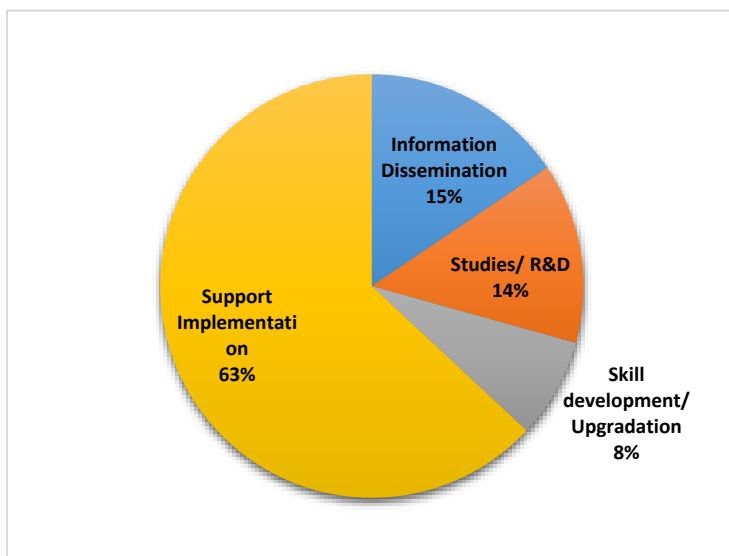


Figure-2 suggests that 63% of the total number of schemes support implementation whereas 15% support information dissemination, 14% support studies and R&D and 8% support skill development and training.

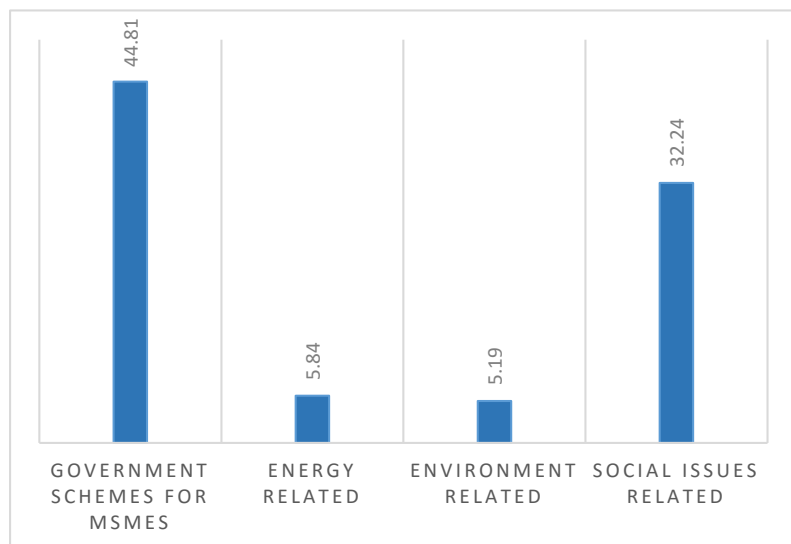
There is adequate data available on the policies and programs of Government of India and the State Governments relating to the development of MSMEs, including schemes for energy efficiency and environment protection. However, there is hardly any literature available on the perception of the MSMEs about Government

Schemes meant for their development. The following questions were considered important.

- What is the level of awareness amongst MSM entrepreneurs about the various schemes of Government, especially those relating to sustainability?
- What is the extent of accessibility of these schemes for the MSM entrepreneurs?
- What are their views on appropriateness and adequacy of Government schemes to meet their needs?
- Whether sustainability issues are of concern to them while formulating their development strategies and in their operations?

Therefore, to meet this gap in information, the Foundation for MSME Clusters undertook a survey based on a structured questionnaire to elicit the opinion of the MSME entrepreneurs on these issues. The information was collected by the project field staff by interviewing 154 MSM entrepreneurs in Punjab, Andhra Pradesh, Rajasthan, West Bengal and Odisha representing a wide range of industries between February and July 2015. A copy of the Questionnaire and methodology of the survey undertaken and the analysis of the responses are given in **Annexure-4**.

Figure 3: Awareness of the Schemes (in %)



Out of 154 enterprises surveyed by FMC, less than half of the sample (69 entrepreneurs or 44.81%) were aware of government schemes in general, while the rest of the enterprises (85 entrepreneurs or 55.19%) were not aware of any scheme at all. The depth of knowledge of the schemes was also very poor. Out of the 69 enterprises of the total sample of 154 who were aware of Government schemes, 35 entrepreneurs were aware of only one scheme, 13 entrepreneurs each were aware of 2 and 3 schemes, while only 8 entrepreneurs were aware of more than 4 schemes. We could therefore conclude that:

Learning no. 1: The general awareness about the public schemes of assistance is very poor among the enterprises.

A specific question was thereafter asked about their awareness about SCP related schemes. As far as awareness about schemes for energy efficiency are concerned, only 9 entrepreneurs (5.84%)

indicated that they were aware of the schemes and as for schemes for environment protection are concerned only 8 entrepreneurs (5.19%) stated that they knew of these schemes. 49 entrepreneurs (32.24%) knew about social issue related schemes. The figure in the case of social schemes is slightly higher, reportedly due to schemes like ESIC and the government regulation on compulsory insurance of workers. The awareness of welfare schemes for workers was significantly higher in West Bengal and Odisha (77.78% of the sample of 36 entrepreneurs) and the lowest in Andhra Pradesh (26.83% out of a sample of 41 entrepreneurs). In Punjab and Rajasthan, the percentages were 36.11% and 41.46%. Accordingly it can be concluded:

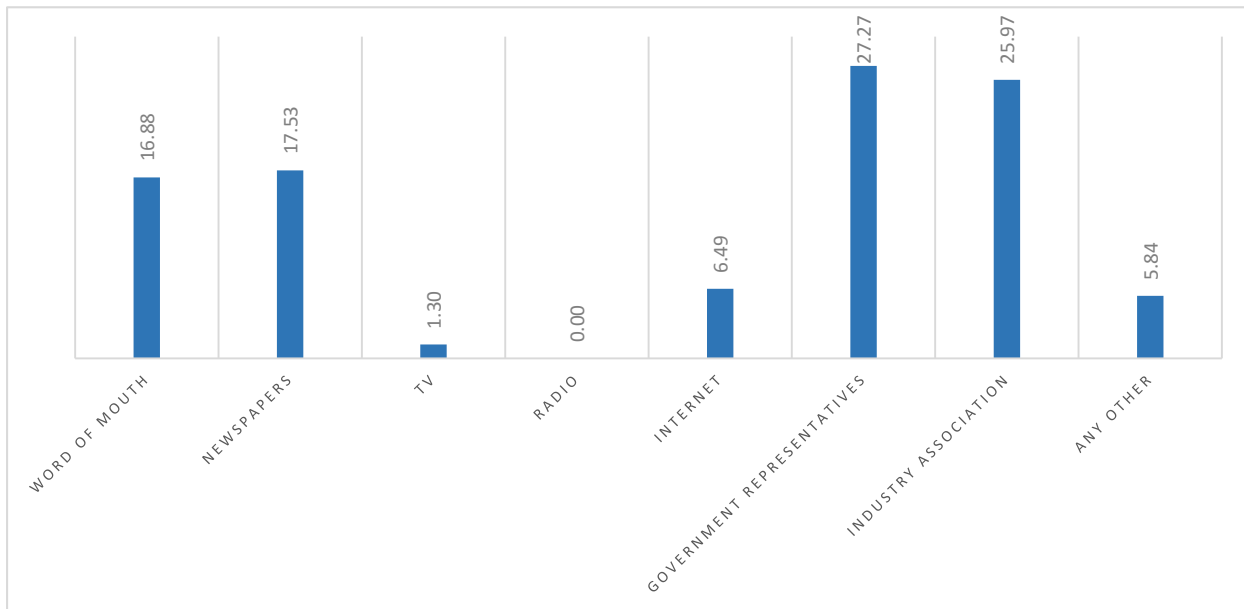
Learning no. 2: The awareness about issues pertaining to energy efficiency, environment and social issues is significantly low.

As regards the respective roles of the Central Government and States Governments in the promotion of MSMEs, only 17 respondents were aware of State Government schemes while 108 respondents were aware of Central Government schemes. The role of Government of India in the promotion of MSME development remains far more significant compared to that of the State Governments. With the substantial devolution of financial resources to the State Governments on the basis of the 14th Finance Commission recommendations, it would be desirable for the State Governments to now assume a greater role in the formulation of new schemes for the development of MSMEs.

Of the 205 schemes of the different Ministries of Government of India, the schemes that are most known and popular in terms of applications filed for drawing benefits are CLSS, PMEGP, MSE CDP and CGTMSE. Of the various sources of information about Government schemes, Government officials, especially officials of the District Industries' Centres and MSME DIs, were the most important source of information (27.27%). However, the respective industries' associations came a close second as a source of information on Government schemes (25.97%). T.V. and radio were most insignificant as far as providing information to them on Government schemes. There is clearly a case to strengthen public media as an instrument to create awareness about Government schemes for the development of MSMEs that would include, schemes for the promotion of schemes relating to energy, environment and workers' health and safety. It can therefore be concluded:

Learning no. 3: The outreach awareness about the public schemes is through District Industries Centres and MSME DIs followed by the Industry associations.

Figure 4: Sources of Information (in %)



The feed-back from the FMC survey indicates clearly that MSM entrepreneurs also look upon sustainability issues primarily from the aspect of need to comply to statutory regulations entailing a certain element of duress. The likely economic benefits of adopting environment-friendly production techniques are hardly understood or appreciated. There is a well-established, proven business case for green production systems. Cleaner production systems, adoption of waste minimization measures, commercial use of industrial wastes, good house-keeping are measures that have the potential to reduce costs of production, increase production efficiencies, improve worker's health and safety and, more often than not, even improve the quality of the final products and enhance the brand image of the company. This positive or forward-looking aspect of sustainable development is yet to be grasped by a large majority of the MSM entrepreneurs. In view of this, it is felt that there is a need to create greater awareness amongst MSM entrepreneurs of the economic benefits of sustainable production and consumption so that they come forward more readily to adopt such measures. The next learning that can therefore be drawn is:

Learning no. 4: Sustainability issues are largely looked upon by the enterprises merely as compliance driven and not that can also have a business case.

The survey tried to ascertain the degree of accessibility of MSMEs to the existing schemes meant for their development. It sought to identify the number of respondents who had applied for a scheme in the last three financial years. Only 37 respondents (24 %) out of a total sample of 154 stated that they had applied under one or the other existing scheme. When asked whether the funds received by them under the Government schemes for which they had applied were sufficient and whether the services offered (activities supported) were useful, the response was a rating of 3.28

and 3.19 for the two questions on a scale of 1 to 5 (which means an average rating). It may therefore be drawn that:

Learning no. 4: The adequacy of funds available under most of the public schemes of assistance is considered adequate.

As regards the issue whether the existing Government schemes met their needs, the respondents to the survey opined that their greatest business-related need was the requirement of credit, especially working capital from banks. This need was largely unfulfilled according to 55 respondents out of the sample of 154. A few of the entrepreneurs even stated that they required handholding support to obtain credit from banks. The second most important need was greater support for technology up-gradation that covered technical guidance on the purchase of new or latest technology and selection of equipment. The third most important need was enhanced support for the marketing of their products that included stronger market linkages through identification of new markets for their products, use of mass media such as use of SMS to obtain buyer information, participation in exhibitions, assistance to enter global markets, and hand-holding support for gauging market trends, promotional assistance and so forth. The other important areas where the respondents sought greater focus for Government schemes were infrastructure support (such as land, water, power, rail, road network, electricity, drainage system and common facilities such as testing facilities) and skill-development and skill up-gradation for their workers. It may therefore be drawn that:

Learning no. 5: The top three perceived support requirements among enterprises is access to adequate & timely credit, support for technology upgradation and assistance for market linkages.

Another question that was asked pertained to the time that it takes to access the various schemes of assistance and the procedural issues associated with them. The general perception was that the procedures are cumbersome and it is difficult to access many of the schemes. Therefore:

Learning no. 6: The MSMEs find it extremely difficult to access the different Government departments for obtaining assistance in the areas of their needs.

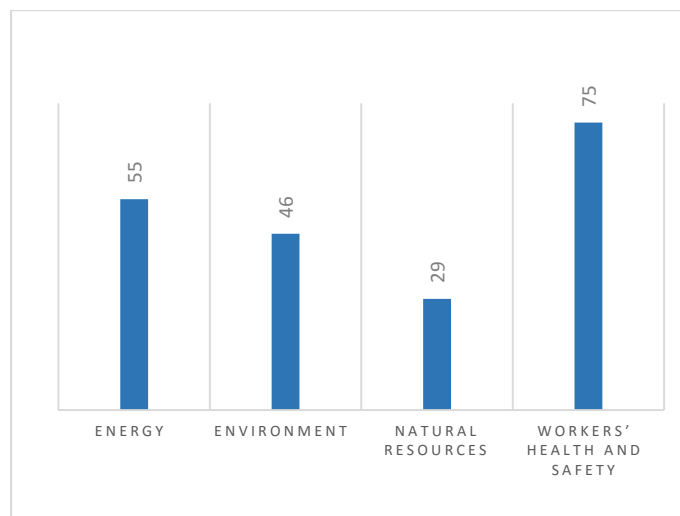
The learnings from the survey raise an important question, namely, why have sustainability issues remained confined to the realm of regulations for all the major stakeholders-the policy makers, the regulators and the MSM entrepreneurs. Much remains to be understood about the adequacy and appropriateness of Government schemes for promoting sustainable development of MSMEs, on the one hand, and of poor accessibility to these schemes by MSMEs and of inadequate awareness of the positive benefits that they can derive from them, on the other hand. The present study is an

attempt to address this largely under-examined question and suggest appropriate policy measures to promote SCP among MSMEs in India.

In order to test the general awareness and concerns related to sustainability and its implications of the business process, some questions were asked retrospectively in the survey. The responses could be recorded for about 114 out of the 154 enterprises. To begin with, entrepreneurs' concerns regarding effects on different aspects of sustainability such as –a) Energy consumption (e.g. coke consumption); b) Environmental impact (e.g. pollution/ waste discharge, etc); c) Over-exploitation of natural resources; d) Workers' health and safety and social well-being were gauged.

Out of these, workers' health, safety, and social well-being as a concern came out to be the major concern of business expressed by 75% entrepreneurs out of 114. Energy efficiency, environment damage and over exploitation of natural resources as major concerns expressed by 55%, 46% and 29% entrepreneurs respectively. Only 40% entrepreneurs mentioned that they have taken any measures to address sustainability concerns identified by them and mostly to comply with the regulatory requirement and for doing small charitable work like tree plantation.

Figure 5: Business Concerns (In %)



Sustainability is a relatively new concept and has been taken into account while setting up the business initially reported by majority of the respondents. However, it is encouraging to note that 70% entrepreneurs mentioned that they are willing to adopt appropriate measures to address sustainability issues in their businesses if knowledge and hand holding is provided. The remaining 30% do not see sustainable behaviour as important for the business. The perception changes need to be brought into among these entrepreneurs through sensitisation, education and exposure to successful examples.

Learning no. 7: The current level of engagement on sustainability issues is low but there is willingness among the entrepreneurs to address sustainability issues provided awareness, capacity building and hand-holding assistance is adequately provided.

With the intention to provide policy inputs on integrating sustainability factors in public support schemes for the development of MSMEs and streamlining such schemes to promote sustainable production by MSMEs, it was felt necessary to analyse the existing government schemes to assess

their linkages with sustainability issues. All the 205 public schemes of assistance were categorised in two parts. The part I culled out those schemes that already have elements of sustainability. Further assessment is made whether the sustainability component can be further deepened. Whether the funds provided under the schemes are adequate and whether the existing schemes can be streamlined to achieve greater impact in the field with the available resources. Part II classified those schemes where there was scope for inserting elements of sustainability. Twelve important schemes for MSME development are selected in this part from the point of view of outlays and coverage. It has been suggested that an audit of other schemes be undertaken for possible revision or re-designing to bring in the elements of sustainability in them. Thereafter, based on these two parts and our learnings so far, suggestions are made on how to integrate promotion of sustainability among MSME clusters using the schemes. This is contained in part III below where suggestion is made to formulate composite schemes for promoting sustainable development of MSMEs on a sectoral and cluster-basis. Such schemes would offer the enterprises in the selected MSME Cluster a package of support/services that would meet most, if not all, of the major needs of the enterprises in order to achieve the goals of sustainable growth laid down for the cluster. Two integrated development programs are given as illustrations of this approach, namely, national program for sustainable development of the foundry industry and national program for greening of brick manufacturing.

Part I: Analysis of Government Schemes with SCP Component Embedded in them: Out of the 205 relevant schemes of different Ministries/Department that are listed in www.clusterobservatory.in it was observed that there are 37 schemes that can directly be brought under the categories of SCP that include energy efficiency, environment and social schemes for the MSMEs. The schemes were judged by examining whether one or more of the 14 pre-determined components were present in the scheme. Out of the 37 schemes it was found that in terms of the budgetary allocation, the social component has been relatively of a high order. Schemes such as Employee Pension Scheme, Prime Minister's Employment Generation Programme and Rashtriya Swasthya Bima Yojana are heavily funded by the Central Government and are all-India schemes. However, despite the large budgetary outlays, these schemes have not been able to reach out to a large section of the MSME population.

In schemes related to environment and energy efficiency too, despite the guidelines and objectives of the schemes, most of the schemes are unable to adequately cover the MSME sectors geographically. The scheme of development and promotion of clean technology and waste minimization strategies can be considered as one such example. The 24 sectors which are covered under this scheme are agro-based industries, aluminum smelter, caustic soda, cement, copper smelter, distilleries, dyes and dye intermediates, electroplating, fertilizer, integrated iron & steel, tanneries, pesticides, petrochemicals, plastics, drugs and pharmaceuticals, pulp and paper, waste oil refineries, sugar, energy, zinc smelter, textiles, paints and resins, chemicals and E-waste. The annual budget that has been allocated for this scheme is not enough to provide enough coverage

for all the MSMEs of the 24 sectors identified for this scheme. The number of ongoing and completed projects have been quite insignificant (18 and 25 respectively). Most of the projects for cleaner technologies have been situated in urban areas, specifically in and around Delhi and Chennai. This also shows that the scheme does not have a wider reach for MSME across the country, especially those located in the smaller urban and rural areas.

Another issue with a few of the schemes is that although the guiding principles and objectives are clearly specified, the results of the scheme as against these objectives are not always clearly recorded. The scheme on Research, Design and Development of Renewable Energy under the Ministry of New and Renewable Energy is one such example. Its focus areas are elaborated as emphasis on Alternate Fuels; Green Initiative for Future Transport (GIFT); Green Initiative for Power Generation (GIPS); Distributed new and renewable energy systems to provide cost-competitive energy supply options for cooking, lighting and motive power; New and renewable energy products for urban, industrial and commercial applications, including energy recovery from urban and industrial wastes and effluents; and MW scale grid interactive renewable electricity systems to contribute towards supplement and eventually substitute fossil-fuel based electricity generation. The Ministry's documents does not record the outcomes achieved in these schemes during the last five years.

Hence, looking at the 37 schemes that have the SCP components embedded in them, it can be stated that:

Learning no. 8: There are only a few schemes that are directly related to SCP component but many of the schemes, particularly the social ones are well funded but with limited outreach, neglecting the rural and semi urban areas.

Part II: Analysis of Government Schemes which do not have any SCP Component but can be re-designed to incorporate it: Schemes available for Technology, Innovation and R&D can be potentially used for promotion of SCP. Along with these, the schemes on skill development, entrepreneurship development can also be used to create basic awareness and capacities among MSME to adopt SCP. We can take the example of Technology Business Incubators (TBI) scheme of DST to illustrate the case. This scheme encourages successful business ventures that create jobs and wealth in their region. The TBIs, besides providing a host of services primarily to new enterprises also facilitate an atmosphere congenial for their survival and growth. Under the scheme, the incubators can help tenant companies in securing capital in a number of ways including managing in-house and revolving incubation funds/ seed support fund, connecting companies with angel investors (high-net-worth individual investors), working with companies to perfect venture capital presentations and connecting them to venture capitalists, assisting companies in applying for bank loan. Incubators can integrate SCP practices into their businesses through this scheme.

Another similar scheme for entrepreneurship development support that can also potentially be linked to SCP is ‘Rashtriya Mahila Kosh (RMK)’ that was established by the Government of India under the Ministry of Women & Child Development. The aims and objectives of the Kosh are to undertake activities for the promotion of credit as an instrument of socio-economic change; development through the provision of package of financial & social development services; to demonstrate and replicate participatory approaches in the organization of women’s groups for effective utilization of credit resources leading to self-reliance; to promote and support experiments in the voluntary and formal sector using innovative methodologies; to promote research, study, documentation and analysis, to promote the federation and networking of women’s organisations for shaping & exchange of experience and information; and to develop skills in response management & social mobilization; to promote and support the expansion of entrepreneurship skills among women; and promote and support grass-root level societies and organizations and other participatory structures for providing for women effective access to decision making. Considering the fact that this scheme is meant for grass-root level initiatives, it is believed that this would focus on a large variety of crafts and local food processing besides many others it already supports SCP. The potential components that can be enhanced using this scheme are SCP-oriented financing or Green financing, Occupational Health and Safety (OHS) to ensure workers’ health and safety in all manufacturing and service activities.

Another example of where technology-related schemes can also have an SCP component is the Technology and Quality Upgradation Support (TEQUP) to MSMEs. By incorporating the SCP component, MSMEs can be encouraged to implement energy efficient techniques in the enterprises with the help of various sub-schemes such as clean development mechanisms and establishing carbon credits aggregation centres in various parts of the country.

The Ministry of Culture provides many fellowships, at both the junior and senior levels for artisans and for the revival of tribal traditions. If these schemes focus on SCP components by having special themes or categories for traditions that highlight sustainable consumption and production, more emphasis can be provided for the improvement of environmental and social well-being.

However, not all the schemes are specifically designed for the MSMEs in particular, such as the Support to Training and Employment Program for Women under the Ministry of Women and Child Welfare or Assistance to States for Developing Export infrastructure and Allied activities scheme under the Ministry of Commerce and Industry. The first step would be to align such schemes with the needs of MSMEs and ensure that MSMEs across the county are aware of these schemes. Thereafter, the concerned administrative Ministries can introduce SCP components to ensure sustainable development of the assisted enterprises. Therefore:

Learning no. 9: There are several public schemes of assistance that can be aligned to meet the SCP objectives by incorporating relevant elements.

The part III below, building on the analysis above provides an integrated approach towards formulating schemes of assistance.

Part III: Integrated Approaches to formulating Schemes for Promoting Sustainability of MSME Clusters: Most of the current schemes for MSME development of the various Ministries/Departments of Government of India and in particular, the current schemes of the Ministry of MSMEs, address general thematic issues. Some of these schemes are for common infrastructure development (MSME Cluster Development Program, MSME CDP); implementation of energy efficient technologies; setting up Carbon Credit Aggregation Centres; technology up-gradation; promoting Lean Manufacturing, providing access to credit (Credit-linked Capital Subsidy Scheme), quality improvement (Quality Management Standards/Quality Tools Scheme for MSMEs, QMS/QTT), assistance to achieve national and international standards, (ISO 9000/14001/HACCP Reimbursement Scheme), marketing assistance schemes (Marketing Assistance and Technology Up-gradation Scheme for MSMEs, Vendor Development Program for Ancillarization, Export Promotion Program for Packaging), capacity building of new entrepreneurs (Support for Entrepreneurial and Management Development of SMEs through incubators), promoting use of information technology in MSMEs (Information and Communications Technology schemes for MSMEs), assistance in developing new designs (Design Clinics Scheme) and creating awareness about intellectual property rights (Building Awareness on Intellectual Property Rights for MSMEs). These schemes can be availed of by any of the MSMEs, either by individual enterprises or by a group of enterprises, across all sectors.

There are only a few examples of sectoral programmes that encompass various schemes with defined objectives to achieve over a given time period. Some of these targeted programmes are National Leather Development Program of the Department of Industrial Policy and Programs (DIPP), National Jute Development Programme and another one targeting automotive sector with UNIDO and DIPP. Besides, there are specialised institutions to provide support for Khadi & village industries, coir, handicrafts, handlooms, pharmaceuticals, and food processing across different ministries that have similarly a large number of thematic focussed schemes to cater to the needs of their targeted sector. Individual or group of enterprises and can seek support under the various schemes.

These generic approaches across different thematic areas towards the formulation of development schemes for MSMEs has certain serious drawbacks. If an MSME enterprise plans to up-grade its technology and introduce green technology, it would require, first, technical guidance in the selection and sourcing of the new technology. It may have to make changes in the design of the

product and of the production processes. It may also need assistance to obtain credit from a financial institution. For the upgraded technology, it would need to up-grade the skills of its managers and workers. It would also need support to market the new products in the domestic and global markets or link up with a supply chain arrangement. It may have to protect its intellectual property rights. Presently, most MSMEs need to approach the different Ministries/Departments under different schemes for such assistance. The process is time-consuming, inefficient and cumbersome for the small entrepreneurs. The survey conducted by FMC in 2015 of the MSM entrepreneurs clearly brings out the fact that the MSM entrepreneurs find it extremely difficult to access the different Government departments for obtaining assistance in the areas of their needs.

The limited interventions made for up-grading the foundry industry by several government and private institutions in recent years are a good illustration of how sporadic and limited interventions have led to limited impact on the foundry industry as a whole in the country. There have been a few projects taken up for the development of foundry clusters in the country over ever since 1994 by a number of institutions. Some of the institutions that have made good impression are Swiss Agency for Development & Corporation (SDC) in collaboration with The Energy Resource Institute (TERI), Petroleum Conservation and Research Agency, State Bank of India, Ministry of Science and Technology, Department of Industrial Policy and Promotion under IIUS Scheme, United Nations Industrial Development Organisation (UNIDO) and Ministry of MSMEs under MSE CDP. The efforts over the last two decades have together been sporadic covering only some select foundry clusters with a limited outreach and covering only certain aspects of the problems facing the industry. Many of these interventions have been successful but have remained largely as demonstrations of what can be done but scaling up of the results to a nation-wide level, even with a targeted 25% outreach and helping solve even one third of the relevant problems is yet to be achieved. Foundry industry is one of the most intervened and favourite sectors by different agencies, so one can imagine the fate of other sectors.

It would be far more efficient and effective if a planned package of services is offered under a single sectoral scheme to an MSME cluster to cover all aspects that need to be addressed when the enterprises of the identified cluster wish to up-grade their technologies and to introduce green technologies for sustainable development. Therefore, it is recommended that, initially at least, those MSME clusters that are characterized by high energy inefficiency, by maximum adverse impact on the environment and by bad track record on social issues such as worker's health and safety should be taken up for this suggested sectoral cluster-based approach for sustainable development of MSMEs.

A Report brought out by the Foundation for MSME Clusters, GIZ and Indian Institute of Corporate Affairs, 'Mapping Energy, Environment and Social Issues among MSME Clusters in India', 2013, has suggested a methodology for identifying MSME Clusters for public policy interventions on sustainability issues. The criteria used are significance of their contribution to the economy (by

way of output, employment and exports), level of energy inefficiencies, the degree of their contribution to environmental pollution and the level of social issues that need to be addressed. The Report has identified 11 sectoral clusters of MSMEs that need to be given priority in selection, namely, foundry, sponge iron, leather tanning, textiles, dyes and chemicals, electroplating, brick kilns, ceramics, glass and glassware, small cement plants and pulp & paper. In all these identified sectors, MSMEs are predominant and they are often concentrated in geographical clusters.

Two sectors, namely, the foundry industry and brick manufacturing, spread out across the country are selected in this policy paper for a suggested methodology to illustrate the point. While the foundry sector that is the third largest in global output after China and USA has about 5500 enterprises spread over 47 locations, there are close to 145,000 brick kilns all over the country aiding the construction industry. Both the sectors have an adverse environmental and social standards record. (**Annexure 1 & 2**)

Besides the examples of two sectors of foundry and brick kilns, this paper also provides an example of solar energy application in existing and new industrial complexes which can be replicated to provide green solar energy to several small enterprises there. Government of India has recently made a commitment to UNFCCC to meet 40% of its total energy requirement from renewable sources by 2030-2035 as its Intended Nationally Determined Contribution. In view of this, a major push is likely to be made India in the years to come for commercializing solar energy for industries. An attempt is made here to explain such a project for the supply of solar energy to an MSME cluster. The suggested project focuses on the essential factors for establishing the viability of such a project and identifying the areas where there are still significant viability gaps and what needs to be done to overcome them. This blueprint has used the case study of the proposed green MSME industrial complex being promoted by Association of Lady Entrepreneurs of Andhra Pradesh (ALEAP), in Nandigama village, Medak district of Telangana State. This is described at **Annexure-3**.

CHAPTER IV

The Way Ahead: Suggestions for a Policy Framework for the Sustainable Development of MSME Clusters

There are two cardinal principles for suggested policy framework to ensure scaled up sustainable development of MSME clusters. These are **collaboration and convergence**. There is a need for the industry and the Government with its different institutional bodies to collaborate for taking up concrete steps to **collaboratively** undertake and implement identified projects for the sustainable development of MSME Clusters. Merely incorporating SCP components in Government Schemes will certainly not be enough. An analysis of the existing schemes shows that thematic schemes that meet only one particular need of the MSME is not really useful since the MSM entrepreneurs find

it difficult to approach different individual schemes of the Ministries and more from different ministries. They need a package of services or support under a single initiative that targeted across a sector and cluster. This is **convergence**. Therefore, it is recommended that the approach to the formulation and implementation of Government schemes for sustainable development of MSMEs should be re-designed. There is a need to take up integrated programs for focused development of sectoral MSME clusters at a nation-wide level addressing most, if not all, their needs through a package of services and support interventions so that the pre-determined sustainability targets for the clusters are achieved.

This however is only feasible if the various components of the national and local eco systems are aware about the need and strong enough implement the measures. Clusters of similar enterprises co-located in close proximity in geographical areas provide a unique opportunity in the Indian context to facilitate convergence and coordination among the stakeholder some of which require capacity building. The MSM entrepreneurs in the selected clusters need to be committed on their own to achieve the targets to achieve sustainability. They need to take initiative to take the required measures, not because of Government's directions or because of statutory requirements, but because they are convinced themselves that it is 'good business' to be clean producers. They should take responsibility for eliminating pollution and protecting the environment as part of their business responsibility. The role of the industry associations or BMOs, is critical in creating this awareness and commitment among their members for sustainable development. Fortunately a number of successful development initiatives reflect that there is a strong business case that exists at least at the initial levels of upgradation that is less capital intensive and can be undertaken with shorter pay back periods. This however needs to be complemented and supplemented with several other measures that are considered to be more risky, have longer pay back period and are of the nature of public goods. The role of government through its development policy framework and a large number of public schemes of assistance become relevant here.

The bigger question is how this can it be done? There are at least eight ministries at the national level, the prominent among these being Ministry of MSMEs, Ministry of Textiles, Ministry of Environment and Forest & climate Change, Ministry of Entrepreneurship & Skill Development, Ministry of Industry & Commerce besides more than a thousand institutions in the public sector that can be relevant. Among the estimated 3500 industry associations, there are national, regional and local besides besides sectoral & market oriented that need to work with the government and its various institutions. Buyers, civil society organisations, media and judiciary are other strong pillars that are related to business in general and sustainable businesses in particular. How can the relevant institutions link and draw up initiatives to work together? The following are some of the suggested measures that need to be taken by industry associations and Government as a collaborative effort:

- 1. Mapping and selection of MSME clusters for special interventions:** It is first of all important to identify the clusters that are significant contributors to pollution and thus lead to environmental degradation. Coincidentally, several of these clusters also have negative social issues. One broad methodology for mapping of such clusters has been suggested and used in the document “Mapping Energy, Environment and Social Issues among MSME Clusters in India”, 2013, produced by Foundation for MSME Clusters, GIZ and Indian Institute of Corporate Affairs. This identified 176 clusters across 11 sectors. There is however need to update this every 3 years with hard data from the field and PCBs across the country. Those MSME clusters that are the highest contributors to pollution and environmental degradation should be first selected for implementing intergrated programs for sustainable development of the clusters in a phased manner, with targets and benchmarks set for individual enterprises as also for the cluster as a whole under various parameters (energy efficiency, emissions levels, elimination of waste, reuse of waste etc).
- 2. Setting up platforms for Government-Industry consultations and collaboration:** The Nodal Ministry for implementing such integrated programs should set up a Consultative Body for the selected MSME sectors consisting of representatives of lead industry asociations, of specialized research institutions, of training institutions and technical experts to provide a platform for government-industry consultations on policy matters, formulation of national programs for sustainable development of select sectoral clusters and for monitoring and evaluation of such programs. Representatives of other Ministries should also be included in these Consultative Bodies, wherever necessary, to ensure inter-Ministerial coordination to promote SCP. An example of such a Consultative Body is the Foundry Development Council set up recently by Department of Industrial Policy and Promotion, Government of India in 2015. For the selected sectors and clusters, national initiatives need to be drawn up that will be implemented by different institutions in the public and private domain, linking up with one another with clear goals and time frames.
- 3. Reforming Government’s environmental regulatory mechanisms and promoting market-based instruments:** Governments primarily use legislation, rules and regulations to address environment concerns. Action to mitigate impact on environment by industrial activities is left to the relevant administrative departments who manage it only through legislative enforcement. The efforts of Government agencies to monitor and enforce compliance to regulations have not been very effective. There is widespread criticism of rampant corruption in Pollution Control Boards. The ownership of environmental concerns is not widely held by several important stakeholders such as the community, public and private institutions and more importantly by the main polluters such as industries. Several state governments look upon enforcement of environmental laws as a tool to enhance revenues for the States. Even for issuing ‘No Objection Certificates’ a substantial fee has to be paid. This needs to change. Government should not use statutory instruments alone to address problems

of industrial pollution and environmental degradation. It should adopt a development-linked approach to tackle these problems by using development linked instruments such as compulsory educational instruments for the the polluters. These development instruments should also provide the polluters ‘business case options’ that can be harvested if environmental concerns are taken care of. If this happens, then sustainable growth of MSMEs will achieve its own self-propelled trajectory.

Voluntary monitoring and compliance by industries needs to be strengthened with industry associations and cluster management organizations. There is a need to put in place disclosure mechanism for the adherence to the responsibility practices. These Business Responsibility practices and disclosure norms should be finalized only after wide-ranging consultations within the respective industry associations. The associations should take full responsibility to ensure that the monitoring and evaluation mechanisms function satisfactorily. The monitoring should be done not only for the individual enterprises but also for the cluster as a whole so that the concept of joint and several responsibility is achieved. The involvement of local communities and media will further ensure the same.

- 4. Formulating and implementing a National Recycling Policy:** There are several beneficial uses of waste. Commercial use of industrial waste can contribute to the spinoff of several new enterprises. A significant part of the polluted output however goes into the environment because it is not properly segregated and channelled for possible commercial uses. E-waste, construction waste, engineering waste and chemicals from enterprises are a few examples. Public policy should consciously promote ‘waste to wealth’ initiatives building on the concept of industrial symbiosis. The waste produced by one industrial activity could become a raw material for another industrial activity. This would require putting in place public policies for awareness creation and developing linkages among polluters and potential users. The policies will also need to support R&D in this area. For instance, slag produced by foundries should be used to produce paver bricks and waste foundry sand can be used as an input in the manufacture of concrete.

The promotion of a national recycling industry based on modern techniques and enveloping the current unorganized recycling sector should be given top priority. Recycling of materials is and has been a prevalent and widespread activity in India but has been largely confined to the unorganized sector without significant external support to improve and mainstream the activity without consequential hazards associated with it. The opportunity and market potential for waste management and recycling in India is immense but scientific recycling on a large scale can be achieved only through an organized recycling industry driven by proper policy guidelines from the Government and by the application of the more modern technologies. Such mainstreaming of the recycling activity will give this industry respectability as well. There is a need to integrate the large number of persons involved in this activity at present with the new

recycling industry to be established. This will lead to inclusive growth and a win-win situation for both the unorganized workers and the new industry entrepreneurs. Waste collection, sorting and grading can be an arduous but essential tasks. This can lead to improved health and safety conditions for the traditional workers as well.

Training of staff of local authorities such as municipalities and of pollution control authorities and officials of industry-promotion agencies in recycling industry. Polluter pays principle must be followed in all public policies. Government's responsibility will be to develop structured framework and guidelines for the recycling industry. It should develop standards to support recycling and recovery of products. It is necessary to emphasize the need for strengthening the capacities of local bodies in this field. The program should aim at promoting waste to energy, co-processing and waste exchange activities. It should promote organized recyclers' associations.

- 5. Investing in R&D projects for developing green products and technologies:** This would require favourable public development initiatives and substantial investments to support public as well as private R&D initiatives for the re-designing of existing products or for the designing of completely new products and processes that will be eco-friendlier than the conventional ones. A Public-Private Partnership approach for R&D projects would ensure that the projects selected are industry-relevant and industry-driven. Efforts should be made for identifying, sourcing and promoting the use of best available technologies from all over the world for specific manufacturing activities, after ascertaining their appropriateness for the MSME sector. Government agencies such as National Small Industry Corporation, select CSIR labs, Bureau of Energy Efficiency and private institutions such as TERI, Development Alternatives will have to take the lead in this exercise with grant support from the government that ensures strong offtake from among the industry. The initiative to take a pro-active role in promoting sustainability of MSMEs should be taken by MSME associations with support and encouragement by Government with new schemes or components of existing schemes to encourage green technologies through convergence mechanism. These technologies should be should be appropriate and affordable for MSMEs. Cheaper credit to MSMEs should be provided for adoption of green technologies and for supporting/promoting green entrepreneurs who have developed in-house green technologies. This would partially reduce the risks of adopting and commercially scaling up the new green technologies. Other initiatives that can be taken is the promotion of venture capital for such green entrepreneurs, training and mentoring such green entrepreneurs, providing incubation facilities, handholding assistance for intellectual property registration, legal support, commercialization of new technology and so on.

- 6. Defining ‘Green Products’, ‘Green manufacturing practices’, ‘Green infrastructure’, ‘Green buildings’, ‘Green technologies’ and so on:** There is no widely accepted global or national standard for defining a product as a green product. However, there is a broad understanding what the term ‘green product’ would imply. It is generally understood that 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 based on a Life Cycle Assessment. Green products might typically be produced completely or partially from recycled components, be manufactured in a more energy and water efficient way, be manufactured with no toxicity in the process or product and be supplied to the market with eco-friendly packaging. Products that are more water efficient, energy efficient in their use and manufacture (e.g. BEE-rated electrical appliances), products marked with carbon/water footprint, products produced from recycled materials, products that do not have any hazardous materials, products that are bio-degradable and products that, after use, can be re-cycled or re-used. However, for each product more specific definitions and benchmarks need to be developed so that they are identifiable, measurable and verifiable.

Comparison of the environmental performance of a product with national/international benchmarks for its respective product category can be made to determine the level of ‘greenness’ of the product. An index of greenness has been developed by Asian Productivity Organization and by International Organization for Standardization. It is understood that MoEF&CC is currently working on classifying product specifications for specified green products.

- 7. Developing Life Cycle Inventory (LCI) data for MSME products:** Besides the production side, focus of the policy framework also needs to be in the sustainable consumption side. LCI is a tool to quantify and analyse environmental impacts of products and services through their entire life cycle. This has not still been taken up in any significant manner in India. It requires, no doubt, a lot of time and effort and can be extremely costly. Initially only a few products may be taken up for LCI data that contribute significantly to the environmental degradation and have high social implications. It will again require co-operation between government and private industries and specialized institutions to be successful. Once the technique for life cycle analysis of products is understood and mastered, more products can be added.
- 8. Making producers and consumers aware of the benefits:** Producers and consumers need to be made aware of such new ‘green products and services’ with longer life cycles so that they take up measures for improving sustainability as an expression of their own commitments and not as compliance to Government’s regulations. A nation-wide awareness campaign should be taken up as a collaborative effort of industry associations, Government and NGOs, international organizations like UNDP, UNIDO, GIZ etc. It is suggested that initially the interventions should focus on those products (foundry products, leather products, bricks etc.)

that are being produced by the identified less sustainable MSME clusters. In a phased manner other products can be also covered so that by 2030 almost all MSMEs involved in pollution and environmental degradation are covered. Labeling of Green Dot products, e-commerce of green products, eco-friendly packaging are some other mechanisms by which marketing of green products can be promoted and facilitated.

9. SCP-oriented financing or Green financing: Inadequate access to institutional finance was considered as one of the biggest hurdles by the MSM entrepreneurs in their response to the survey conducted by Foundation for MSME Clusters between January and July 2015. Public policies should be such as to encourage the flow of institutional finance to those manufacturing enterprises that produce or intend to produce ‘green products’ or to adopt ‘green manufacturing processes’. The extent of financing of the manufacture of such green products can be monitored by making financial institutions report to RBI and to Department of Financial Services on such matters on a regular basis in a well-defined format. Appropriate financing models to suit the needs of the MSMEs need to be developed for such initiatives. (e.g. ‘Pay as You Earn’).

10. Promoting green public procurement and strengthening green supply chain mechanisms: It is understood that MoEF&CC is working on developing Green Procurement guidelines for Government Departments. Each government department should fix minimum quantities for purchase of green products based on the guidelines thus fostering the growth of those MSMEs that choose to develop and commercialise green products & services. The concept of green procurement should be embedded in the mandatory public procurement policies instituted and implemented w.e.f. April 2015. There is however need for extending assistance to the ‘adopted’ MSME clusters for development of green products, implementing green technologies and for hand-holding through the entire development process cycle, testing of raw materials and final products, marketing of final products, etc.

11. Building capacity of industry associations: Building capacity of industry associations or Business Management Organizations (BMOs) to enable them to take the lead in taking up schemes for promoting sustainability of the enterprises in their clusters. There are currently only a few BMOs that provide real services and have the capacities to do so. These BMOs are an important source and channel for new ideas, ensuring outreach and undertaking meaningful trials. They are also an important sources of information to the MSME enterprises about Government schemes.

12. Formulating and implementing integrated development initiatives among clusters and sectors: that would consist of a package of schemes for extending support to sectoral MSME clusters to meet most, if not all, of their needs so as to enable them to achieve pre-defined targets on sustainability parameters. The programs should be formulated by Government in

consultation with industry associations. Some of the areas that should get focussed attention under these integrated development initiatives are the following:

- i. Ensuring energy efficiency:** Since the use of fossil fuel in industrial production and in transportation is considered as the major source of “Green House Gases” (GHG), the aim should be to minimize the use of this type of energy per enterprise of production. Standards can be laid for energy efficiency for each sector of industrial activity and individual enterprises’ bench-marked against these sectoral standards. Public policy would require to put in place a system of incentives and disincentives for individual enterprises to achieve the sectoral goals of energy efficiency. Ministry of Power, Government of India and the Bureau of Energy Efficiency could consider including some of the large sectoral MSME clusters under the PAT Scheme on aggregate basis.
- ii. Increasing use of new and renewable energy:** Since new and renewable sources of energy such as solar, wind, bio-gas etc. are considered less harmful to the environment than fossil fuels, the aim should be to increase the use of these sources of energy in all industrial processes. The use of new and renewable energy per enterprise of production by MSMEs can be an identifiable, measurable and verifiable element of SCP. Public policy would require to put in place a system of incentives to make these renewable sources of energy economically more attractive to the manufacturing enterprises as against conventional energy.
- iii. Supporting MSMEs in controlling pollution:** The risk involved in investing in R&D for cleaner technologies is high. MSMEs do not have the funds individually to invest in such projects. Moreover, they do not have technical capacities to under take the R&D or hire consultant for the same. Pollution control departments need to come out with tested technologies and approved vendors for sourcing of cleaner technologies. In addition, there is a need to provide financial support and handholding to MSME clusters to adopt/ adapt cleaner production technology and solutions.
- iv. Minimizing waste at every stage of the production process:** Waste is generated in the case of most industrial processes. These can be in the form of solids, liquids or gases and can be toxic or non-toxic in nature. For instance, foundries produce waste sand, slag, flue gases and so on. Textile dye enterprises produce water containing chemical dyes. Leather enterprises produce water containing solvents. There is a need to develop green technologies specific to each industrial activity that will reduce the level of waste produced per unit of production. The waste produced by each industrial enterprise can be identified, measured and verified and measures taken to minimize the production of such waste. Public policy would require to put in place a system of

incentives (support for R&D projects to develop new green technologies that will minimize waste production) and disincentives (strict implementation of Pollution Control Laws).

Effective control and management of waste would have to be promoted. It may not be possible to completely eliminate waste production in all industrial enterprises immediately. However, efforts should be made to effectively control and manage waste that is possible in practically all industrial activities. For instance, in the case of MSME leather enterprises, a collective effort to manage waste can be made through Common Effluent Treatment Plants located in leather clusters. In the case of MSME foundries, common sand treatment plants and re-use of such treated sand can be encouraged through appropriate public policies.

- v. **Introducing Lean Manufacturing Techniques:** Lean production is a multi-dimensional approach that encompasses a wide variety of management practices such as Just-in-Time, Total Quality Management (TQM), Total Preventive Maintenance (TPM), Human Resource Management (HRM), and Supplier Chain Management (SCM) and so on in an integrated system. The core thrust of lean production is that these practices can work synergistically to create a streamlined, high quality system that produces finished products at the pace of customer demand with little or no waste. The existing scheme of Lean Manufacturing must be made mandatory for application in the select less sustainable clusters beginning with the MSMEs with higher environmentally adverse implications followed by the lesser ones.
- vi. **Encouraging the use of ICT in manufacturing to eliminate waste and minimize the use of natural resources:** The use of Information Technology in the designing of products and in the manufacturing processes can lead to considerable reduction in waste and in quality improvements. Software packages are available in the market to meet the requirements of specific industries that can shorten the product manufacturing cycle and reduce waste through simulation techniques. Public policies need to support MSME clusters in making available such relevant software packages in Common Facility Centres that can be used by the members of the cluster on time-share basis. The benefits from the use of such software packages by select MSME clusters can be identified, measured and verified.
- vii. **Up-grading the skills of workers, supervisors and managers especially from SCP angle:** MSME manufacturing enterprises may install new equipment that are based on “green technologies”. In such a situation, the enterprises may have to consider hiring of new technical staff trained to manage such equipment or else, if possible, train the existing staff in the use of this equipment. The staff needs to be made aware of the

benefits to the environment and to themselves in particular about the benefits of such green technologies so that they implement them effectively in a sustained manner.

- viii. Mandating that all new factory buildings should be green:** Green buildings can contribute substantially to energy saving, water harvesting, healthy and safe environment for workers etc. Efforts need to be made by Government and industry associations for promoting and creating market demand for the construction of green buildings for the factory and office blocks of MSMEs. State governments should take the lead in developing guidelines and standards for green factory buildings so that local conditions can be taken in to account. Capacity building of green architects, contractors, evaluators, and assessors should be taken up intensively. Government should encourage experts in this field to set up accredited laboratories for testing green building materials and should identify nodal agencies to certify or rate green building materials and green buildings. It should be mandatory for new industrial estates set up for MSMEs should have only green buildings. Already green rating systems are in place such as IGBC, LEED, GRIHA etc. The design and size of roof-tops for new factory buildings could be specified so that solar panels can be installed in MSME clusters on a large scale.
- ix. Ensuring that issues relating to Occupational Health and Safety (OHS) are addressed:** Ensuring workers' health and safety in all manufacturing and service activities should be an important element of sustainable production. Public policy needs to provide incentives (awards for industrial enterprises that achieve high levels of OHS) and disincentives (labour laws to make measures for workers' safety mandatory) to the manufacturing enterprises to ensure workers' health and safety.

Annexure 1: Strategy for Sustainable Development of Foundry Industry in India

Significance of foundry sector: The foundry industry in India is the mother industry that provides a wide range of ferrous, non-ferrous, aluminium alloy, graded cast iron, ductile iron and steel castings to almost all engineering industries. The sector has strong linkages with automobiles, industrial machinery (such as machineries for textile, jute, cement industries), pipes and fittings, sanitary ware, pumps, compressors and valves, electrical equipment and diesel pump-sets & engines, aeronautical & space, agriculture machineries, railways and so on. The automobile industry is, by far, the largest user industry procuring as much as 32% of the total castings produced.

In spite of the critical role of the foundry industry in the manufacturing sector and the increasing demand for foundry products from the user industries, the required investments in this sector are not taking place. Consequentially these user industries are heavily dependent on imports. It was fore-casted by the Indian Institute of Foundry-men that the demand-supply gap is likely to grow from the then level of 8 million MTs in 2011 to the extent of 11 million MTs per annum by 2016. It may be noted that the total production output of the entire foundry sector in 2015 was 10 million tonnes only while China produced 30 million tonnes followed by USA at 10 million tonnes in the same year.

Challenges: The fact that the foundry industry in India is not able to meet the increasing demand of the local user industries, particularly of the auto and auto parts segment, both in terms of quantity and quality has fuelled the anxiety amongst the foundry industry representatives of a possible surge of further imports in the years to come. Large-scale imports of foundry products, even of the less sophisticated products, may inevitably lead to the extinction of several local foundry enterprises that are unable to compete with the imported products in terms of quality and price. It could also lead to substantial dependence of Indian manufacturing industries on critical imported foundry products and thus increasing their vulnerability to international economic forces. In view of all the above factors, it is evident that the development of the foundry industry is critical for the development of the entire manufacturing sector in the country.

However, foundry industry is categorised as one of the highly polluting industries in the country and has been placed in the 'Red Category' by the Central Pollution Control Board owing to an extensive use of coke for melting grey iron by more than 90% of the enterprises, mostly in the micro and small industry segment. It is also an energy-intensive industry where energy cost is between 25-30% and most of the small foundries use obsolete technologies that are highly energy-inefficient. Therefore, if the industry has to grow rapidly to meet the increasing domestic demand for high value, high quality castings, it is essential that concerted efforts be made by Government and the industry. They can jointly mitigate the environmental issues related to the industry on

priority and ensure that the future development of the industry is based on greener production techniques.

Recommendation: It is recommended that a new integrated program in mission mode for the development of the foundry industry be formulated and implemented. Several critical areas need to be targeted, beginning with technology upgradation, skill development of workers, provision of access to finance, redesign of products, ensuring occupational & safety concerns of workers, provision of social safety net to workers and finally safe disposal of burnt sand & slag. The program may be called “National Foundry Development Program” (NFDP).

Annexure 2: Strategy for Greening of Brick Manufacturing in India

Significance of the brick manufacturing sector: India has achieved rapid economic growth since the launch of the liberalization policies in 1991. GDP growth rate has averaged about 7% for the last 5 years. The population of the country has also been increasing steadily. Both these factors have led to a rising demand for bricks for housing and commercial building construction. As per 2009 estimates, the brick production is increasing by 5-10% annually due to the huge demand from these two sectors and due to various developmental projects for infrastructure. India has estimated 145,000 registered/unregistered brick kilns producing more than 236 billion bricks. It is the second largest producer of the brick in the world after China.

Present Status of Brick Manufacturing Technology and challenges associated: Central Pollution Control Board (CPCB) has placed brick manufacturing in the “Red” category in view of the fact that it is highly resource and energy intensive and is polluting owing to the prevalence of obsolete production technologies. The clusters of brick kilns are the source of air pollution affecting local population, agriculture and vegetation. A key problem of the red bricks kiln is the usage of top soil that is fertile but used for making bricks. The traditional kiln enterprise itself occupies considerable land area and is subjected to high temperature making the earth there unfit for agricultural activities, after the site is abandoned. The fast depletion of arable land thus caused due to brick making is a matter of concern to India regarding food security.

Brick manufacturing is energy-intensive and uses coal as the main fuel that is highly polluting. With an average consumption of 18 tonnes of coal per 100,000 bricks, the brick sector consumes about 24 million tonnes of coal per year that is about 8% of the total coal consumption of the country (third largest consumer after power and steel sector). In addition, it also consumes several million tonnes of biomass fuels. The share of energy in total cost of brick production is 35-50%. The large coal consumption of the brick industry is the cause of significant air pollution in terms of carbon dioxide (CO₂), carbon monoxide (CO), sulphur dioxide (SO₂), nitrogen oxides (NO₂) and suspended particulate matter (SPM). The large amounts of coal used for brick firing also leave behind bottom ash as residue. The air pollution and bottom ash generated cause considerable health problems, especially related to respiratory health, while also causing damage to property and crops.

The energy used by different types of kilns is given in the table below. It is seen that the Vertical Shaft Brick Kiln (VSBK) is most energy efficient but it contributes only 0.28% of the total brick production. The most energy-inefficient kiln is the clamp kiln that contributes nearly 13% to the total brick production.

Type of kiln	Specific Energy Consumption (mj/kg of fired brick)	Specific coal consumption (tons/100,000 bricks)	Share of total brick production (%)
Continuous kiln			
VSBK	0.7-1.0	11-14	0.28
Zig-zag kiln	0.9-1.1	13-16	NA
Fixed Chimney BTK	1.4	16-20	69.67
Moveable Chimney BTK	1.2-1.75	18-24	17.15
Tunnel Kiln	1.4-1.7	20-24	0.03
Intermittent kiln			
Clamp and other batch kiln	2.0-4.5	28-50	12.86

Source: Sameer Maithel and Urs Heierli, 2008

Social issues: The workers in the brick industry face extreme working conditions. Currently in India, brick manufacturing is a labour-intensive sector, with crude techniques causing considerable drudgery. They are also exposed to high concentrations of Respirable Suspended Particulate Matter (RSPM), during the activity of regulating the fire, as the furnace chamber is covered with ash. The workers are exposed to ash during manual mixing of fly ash and clay. Ash acts as an insulator in the furnace and large quantities of it are lying around in the open in the premises of the kiln. Women are engaged in transportation of green and red bricks by a head load of 9 to 12 kgs. This causes health problems. In spite of the occupational hazards of working in the brick kilns, the workers are not covered by insurance and do not have access to mandatory medical facilities.

In the brick sector, migratory labour is brought in through a contractor from distant places. Since they are not on the direct payrolls of the kiln owner, they are not covered under the current labour laws. The work force is paid on basis of quantum of work and against completion of certain tasks such as moulding of 1000 bricks, transportation of 1000 green bricks etc. The seasonal nature of brick production generates employment for a limited period of six to seven months in a year starting from November. Child labour is still prevalent in several kilns, especially in Bihar. In spite of the efforts of some NGOs to take the children away from this activity and provide them education, the problem continues.

The nature of the work requires skilled labour especially for moulding and firing. There is large scale migration towards the major brick production clusters every season due to this. These tasks

have been undertaken traditionally in the past from father to son in the communities. The last few years have seen a labour shortage as the newer generation does not want to be associated with the difficult conditions of brick sector any longer. A phenomenon observed in certain clusters due to this shortage is the hoodwinking of entrepreneurs by labour by promising their services to multiple owners, taking advances and not turning up.

Environmental regulations:

For the last several years, environmental activists have been raising before the Government and the Courts issues regarding the pollution and environmental damage that is being caused by brick kilns and also the problems of the workers' health.

Government has issued several notifications for regulating this sector such as setting criteria for new kilns, banning more polluting moving chimney brick kilns and banning of top soil use. It has laid down emission standards for vertical shaft brick kilns (VSBKs) and fixed chimney brick kilns and has been promoting the utilization of industrial wastes. The brick kiln owners have to obtain a No Objection Certificate each year from the State Government concerned.

The Supreme Court of India issued a directive for discontinuing the movable chimney kilns and for all brick kilns to conform to new environmental norms. However, due to lax monitoring mechanisms at the field level, such kilns continue to function and flout environmental regulations. While most of the large-sized kilns with adequate financial resources changed over to fixed chimney type BTKs in pursuance of the Supreme Court orders, the small and medium scale brick entrepreneurs with limited financial resources and technical capabilities have not yet switched over to the fixed chimney BTKs and continue to run the highly polluting moving chimney brick kilns.

State Governments need to tighten the regulatory enforcement system at the field level and the penalties for violations of the environmental regulations should be high enough to be deterrents. However, there are limitations to the implementation of regulations through fiat. There is a need to enter in to a continuous dialogue with the stakeholders (brick entrepreneurs, local communities, NGOs, environmental activists etc.) and build a consensus on the need to observe the regulations in the interest of all of them. There is also a need to consult all the stakeholders to frame a National Brick Manufacturing Policy and to implement a nation-wide Program for its development based on green principles.

Recommendation for Greening of Brick Manufacturing: There is a need to formulate a national policy initiative for Greening of the Brick Manufacturing activity by bringing in all the relevant national, regional and local stakeholders. The objective should be to reduce the environmental impact and sufficient investments are made in R&D for the development of green

technologies. Government of India should allocate sufficient funds for implementing the schemes.

The most important elements of such a National program could be the following:

- 1) **Invest adequate public funds in R&D projects** for developing green technologies to be taken up by well reputed Government and Private research institutions. Punjab State Council for Science and Technology has done some credible work on developing energy-efficient kilns. It also took up a successful program to popularize the new technology amongst brick manufacturers in Punjab and in some of the northern States. Swiss Agency for Development & Cooperation in collaboration with TERI has done commendable work on popularizing installation of Vertical Shaft Brick Kilns that are more energy-efficient and produce less emissions of suspended particle matter, besides producing good quality of bricks. Appropriate green technologies from other countries should be sourced and support provided for their adaptation to Indian conditions that requires high degree of customisation with varied types of soils, equipment and skills available.
- 2) **Set up demonstration units and provide technical support for technology adoption:** to convince brick manufacturers of the viability of the upgraded technologies and provide necessary technical handholding in those cluster enterprises where the numbers are large. The services of experts should be provided at a subsidized fee for selection of appropriate green technology, installation of equipment, commissioning of production and overcoming initial problems in production. This will also involve organisation of workers' training along with their supervisors in the manufacture of eco-bricks
- 3) **Incentivise markets by usage of 'green technology' and 'eco-bricks':** The terms green technology and eco-bricks should be defined for guidance of all the stakeholders so that consumers and producers have an incentive to carve a separate market niche. Subsequently, there is need to create awareness through the media amongst all stakeholders about the available green technologies and their benefits to them directly and to the country as a whole. The objective of the campaign should be to encourage self-regulation by the industry with support and encouragement from the local communities. Green building rating criteria should also include usage of 'eco-bricks'. The governments should also encourage procurement of eco-bricks by giving them additional points in the procurement guidelines of Government departments, especially Public Works and Irrigation Departments
- 4) **Facilitate access to bank finance** for brick entrepreneurs that propose to implement the green technologies in their manufacturing enterprises. Small brick kilns are unable to adopt green production techniques mainly because upgraded technologies may be more capital intensive. They are unable to complete the cumbersome procedures of banks to obtain loans. Bank officials need to be sensitised about the need to give priority for such lending and provide facilitation services to such clients.

- 5) **Incentivise the usage of green technology at regulatory level:** State Governments should give 'No Objection Certificates' for 5 years (instead of yearly) for kilns that use eco-friendly technologies. They should also accord industry status to those enterprises that manufacture eco-friendly bricks and place them in 'Orange Category' instead of 'red', thus ensuring the access to institutional financing. In order to facilitate this, training should be organised for regulators about the green technologies and their benefits to the environment

In the background of growing environmental activism in the country, and the successful projects taken up a few development agencies, there is an increasing interest amongst brick manufacturers in learning about new green technologies and sourcing. Inadequate availability of skilled labour and the demand for good quality bricks are pushing them to adopt mechanization. Some of the financially sound enterprises are importing automatic or semi-automatic machinery from Germany and China that enable manufacture of 'Resource Efficient Bricks' (REBs). These machines are energy-efficient and also use less natural resources soil and water. REBs are either hollow or are perforated and provide better insulation. The proposed National Program for the Greening of the brick manufacturing activity should provide an impetus to this movement. It should adopt an integrated approach to address all, or at least most, of the major problems of the brick manufacturing enterprises located throughout the country.

Annexure 3: Sustainable Energy in MSME Industrial Clusters

Roof Top Solar Energy in an Industrial Complex – A case study of ALEAP

Introduction: The success of MSME development will be an extremely important and relevant socio economic boost to society and rural India In particular. Energy access & its assured availability becomes a key factor to ensure the rapid growth of this sector. MSME clusters tend to produce low value added goods, handlooms, handicrafts, products such as basic essential commodities, light engineering, leather products, value add farm products, food preservation packing, sorting etc. and goods that can compete by being produced in manual or semi automated production lines. Hence these industries can be located in areas where highly technical skills are not always available/required. In the Indian context this means a greater fit for MSME's in rural and semi urban small town locations. This also means being able to locate such industries in areas where land and infrastructure are cheaper.

Usually, location of such clusters are at the tail end of the electricity grid where land is affordable. The down side has been the non-availability or irregular availability of electricity in such locations and this issue needs to be effectively addressed to ensure accelerated growth of such MSME clusters. The use of solar energy to partially meet the energy needs of this sector without substantial increase in input energy costs to the industries is discussed in the next sections. The policy intervention and one time incentives is needed to greatly enhance the utility value, long term viability and energy access to such MSME clusters is presented in this report for consideration and suitable adoption.

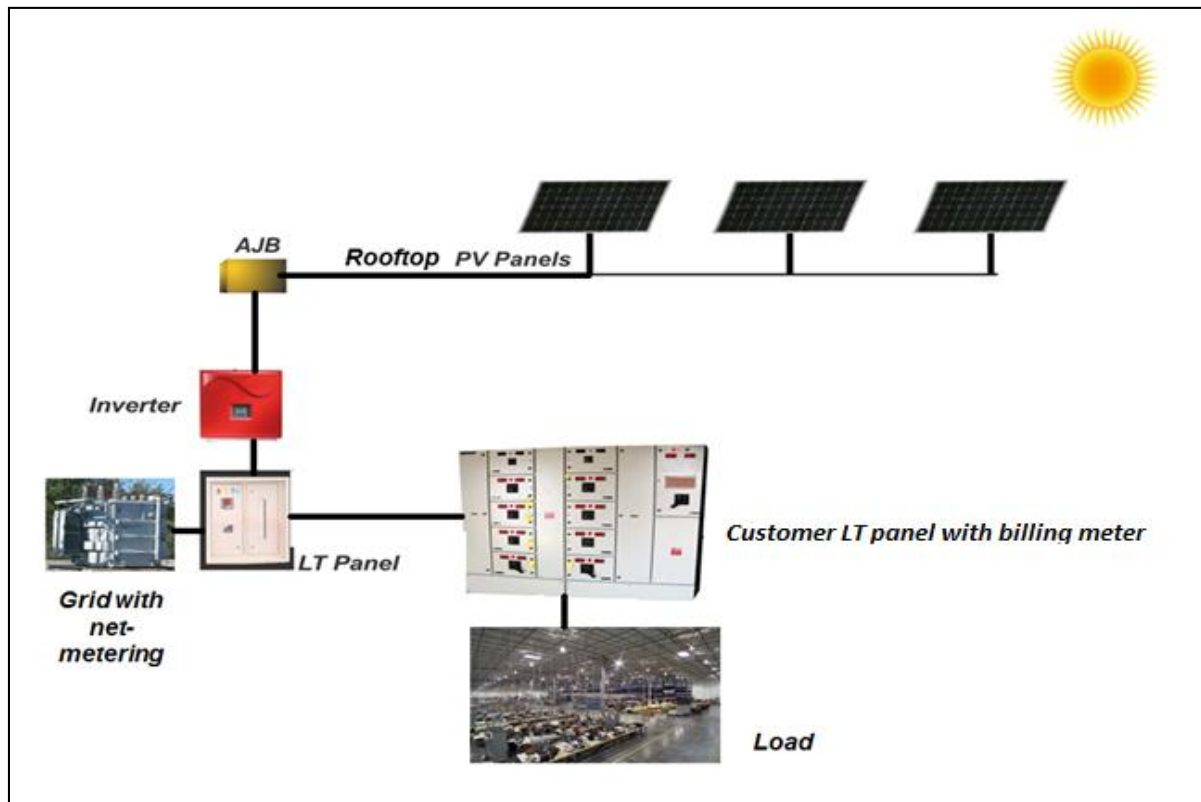
A Case Study of ALEAP-GRIP: ALEAP-GRIP Nandigama, Telangana is an MSME cluster being promoted for lady entrepreneurs to setup small industries in a new industrial complex. ALEAP is a reputed association of lady entrepreneurs with a creditable history of several development initiatives undertaken in partnership with the government at state and national level. This industrial cluster is located about 70 kms from Hyderabad, India and occupies a land area of 86 acres. All essential infrastructural facilities have been planned keeping sustainability, energy efficiency, and environmental friendly practices in perspective to ensure a modern and efficient atmosphere for achieving high productivity. We have studied mechanisms for inclusion of solar energy in the ALEAP-GRIP MSME cluster as a model which can be replicated in several other initiatives for small industry cluster development.

Solar Energy especially Photovoltaic energy systems, has seen dramatic fall in capital costs driven by scale of utilisation, conducive policies, increased indigenous manufacturing and the constant race to drive efficiency improvements leading to cost reductions and more effective utilisation of materials, land and roof areas. The committed goals of Govt of India to meet a 100 GW target of

solar power integration is a welcome initiative. Out of this 40 GW will come from roof top solar by 2022.

How solar works: A simple pictorial depiction below shows the functioning of a solar system which can be easily connected to the tail end grid at the location of the MSME cluster.

Figure 6: Grid Integrated PV System with Net Metering



Choosing a MSME cluster which will justify a viable utilisation of Tail end solar power requires 1) Good solar irradiation at the MSME cluster location and 2) A friendly net metering policy of the local which encourages tail end solar power generation 3) Roof rights for solar installations and easement/access rights wrest with a representative body like ALEAP and not with the individual industry owners. Unless this is ensured a BOOT model cannot be financed.

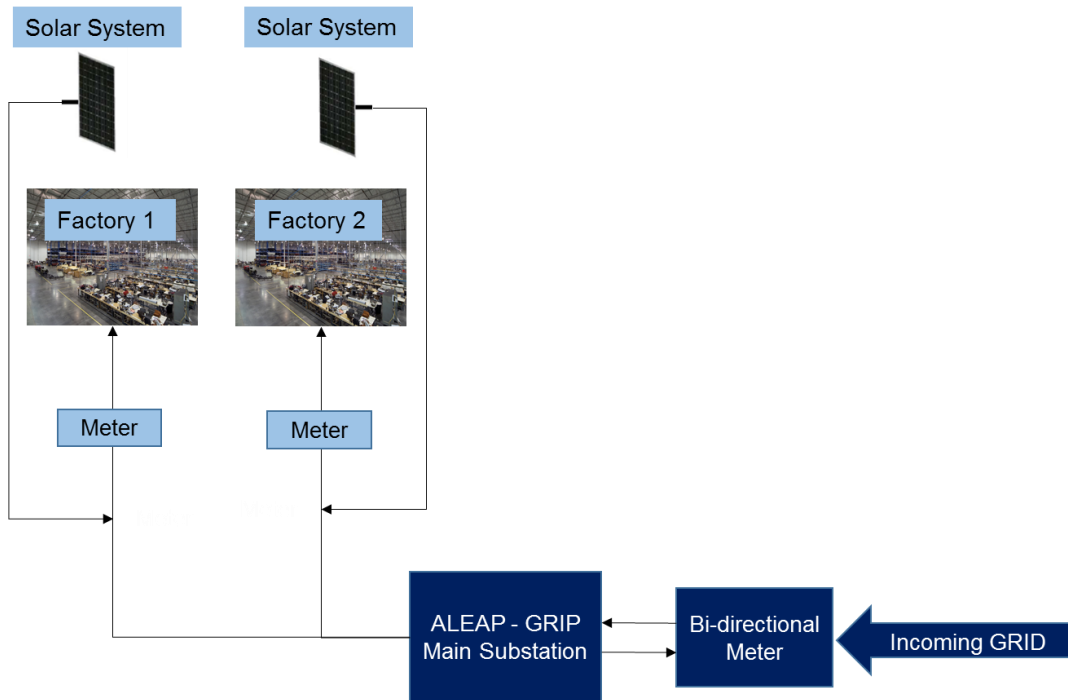
Feasibility: ALEAP–GRIP will accommodate about 200 industries with plot sizes mainly of 1000 Sq. meters & 600 Sq. meters. Typically, a majority of these plots will be permitted to have a building foot print of 50%. Leaving for shading and miscellaneous provisions, it is estimated that 70% of the roof area will be utilised for installation of solar panels. This is roughly equivalent to 70,000 Sq. meters. If optimised tilt and shading tolerances are applied, it is estimated that 8.75

MW of solar roof top inclusion is feasible if installed on all industrial roofs. Common facility areas such as administrative building, canteen and other utility buildings, car parks etc., will accommodate an additional 0.5 MW of solar panels. Hence a total installation of 9.25 MW is feasible.

Expected energy generation: By taking site-specific historical weather data, the expected energy production from the proposed 9.25 MW solar systems was simulated using a software known as PVsyst. According to PVsyst, the possible generation from all the solar systems can be around 15 Million KWh during the first year. This translates to almost 35% contribution by the green energy assuming the consumer load utilisation factor (annualised) will be 50% which translates to an energy consumption of 45 Million kWh per annum by all the enterprises that will be set up in this complex. Additionally, rooftop solar reduces thermal loads in all the buildings by reducing the direct radiation on the roofs and keeps the work places cooler. With an assumed 65% of possible capacity, the solar roof tops will still generate 9.75 Million units of solar energy leading to reduce 5400 tonnes of carbon in the first year. Over 25 years this translates to a carbon reduction of 135,000 tonnes.

The solar plants proposed to be installed in each plot will be typically of 60 KW solar capacity. Several such enterprises will be integrated to build a cumulative capacity of 9.25 MW. The schematic of such a system which can be interconnected into the ALEAP-GRIP grid is shown below.

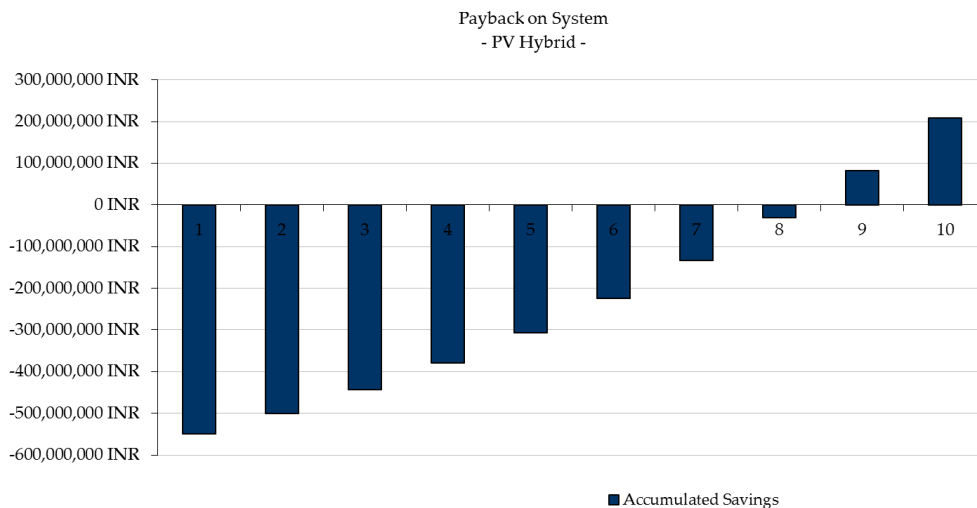
Figure 7: Solar System



This connection will allow generated energy at any given point of time to be used by any consumer at the Industrial park. The string inverters allow immense flexibility and modular addition and is a superior option minimising lengthy DC cabling and maximising overall system efficiency. In the event of holidays and instances when real time solar generation is higher than the real time consumption within the MSME Park, a provision for export into the state grid shall be feasible.

Policy related concerns: The Telangana state policy allows net metering facility which allows excess energy generated from solar to be exported and utilised within the month or, if further surplus generation remains unutilised, this will be purchased by the DISCOM. While the chances of such a purchase of excess energy is remote the availability of such a provision in the policy ensures that all energy generated from solar is monetised. The policy stipulates that the maximum net metering plant rating shall not exceed 500 KVA. Hence to be able to connect a cumulative capacity of 9.25 MW under the net metering scheme special permission must be taken since this is a group captive location with multiple roof generation points.

Billing and Economics: The power generated through the solar roof tops will seamlessly be integrated with the grid supply and the system architecture will feed in solar energy in priority to the grid supply. Hence the consumer pays regular tariff as applicable and levied by the DISCOM. Assuming that DISCOM tariffs will be revised shortly after the UDAY scheme of Govt. of India is implemented and the net tariff paid by the consumer will be an average of INR 6.5/kwh in 2016 and It is expected that electricity tariffs will increase at 5% per annum for the next 10 years to reach global energy cost parity. Based on the available assumptions, the project gives an investment return of 20% on equity and a project payback of 9 years.



Since electricity produced beyond the payback period is virtually free barring a miniscule operations & maintenance costs the users and ALEAP will benefit substantially to the tune of INR 11.7 crores per annum on an average for the next 10 years and sharing of these benefits can be structured to flow to the equity investors. A CAPEX subsidy intervention of 30% is being provided by MNRE for the Govt. Sector, educational institutions, hospitals, research institutions and certain

notified end users. MSME cluster parks must be made eligible for such an investment incentive. 10 year financing of the debt will be required to ensure positive cash flows.

Conclusion: The national level policy of supporting MSME clusters must promote use of roof top solar generation since the tail end grid support receives a substantial impetus and distribution losses are reduced significantly and power availability is greatly enhanced. The scheme of solar intervention for MSME can be implemented in any modular size of multiples of 75 KVA and above at the distribution transformer level and this will provide a tremendous boost to tail end grid power availability and grid stability.

Given that transmission and distribution losses are presently at 15% to reach tail end and the fact that tremendous gaps exist between supply and demand the case of solar intervention is compelling in addition to the environmental benefits which are well known with green energy usage.

Annexure 4: Field Survey Methodology and Questionnaire

Annex 4.1: Field Survey Methodology

The idea of the survey is to understand the status of enterprises across North, South, East and West of India in terms of their awareness and accessibility of government schemes relevant for them. At the same time, the aim is to gauge usefulness of schemes for the enterprises and the areas where support is required by the enterprises.

Sample composition

The zone wise sample composition is given in the table below.

Region/state	Number of enterprises covered
North (Punjab)	36
South (Andhra Pradesh)	41
West (Rajasthan)	41
East (W.Bengal and Odisha)	36
Total	154

The total number of enterprises covered is 154 across 5 states- **West Bengal** (districts Howrah, Bankura, Malda, Burdwan and capital city of Kolkata), and **Odisha** (districts Jharsuguda, Brajrajnagar, Rourkela) in **East**, **Rajasthan** (districts Ajmer and Jaipur) in **West**, **Andhra Pradesh/ Telangana** (capital city Hyderabad, and districts Vijaywada, Kakinada, Chittoor and West Godavari) in **South** and **Punjab** (districts Jalandhar, Phagwara, Ludhiana and Moga) in **North**.

In terms of sector wise distribution, the break up is as follows. NIC (National Industrial classification) 2004 has been adhered to, up to 2 digits, for this classification into sectors. This is because in order to select sectors based on their economic significance indicated by parameters such as employment, GVA (Gross Value Added), employment, turnover and export, the latest MSME census (2011) data has been used. This data uses the 2004 NIC codes for classification of enterprises into sectors to further rank these sectors based on specific parameters including the ones mentioned. Hence, in order to make use of this ranking for selection of sectors for the purpose of this survey, the uniformity in classification has been maintained by using the same classification namely, NIC 2004.

S.No.	Sectoral composition	No. of enterprises
1.	Manufacture of basic metals	21
2.	Manufacture of fabricated metal products except machinery & equipment	15
3.	Manufacture of machinery and equipment	10
4.	Manufacture of textiles	22
5.	Manufacture of non-metallic mineral products	10
6.	Manufacture of rubber and plastic products	7
7.	Crop and animal production and hunting, and related service activities	5
8.	Manufacture of leather and related products	17
9.	Manufacture of paper and paper products	11
10.	Manufacture of chemicals and chemical products	6
11.	Manufacture of furniture	4
12.	Manufacture of electrical machinery and apparatus n.e.c.	3
13.	Food processing	19
14.	Services	4
	Total	154

A differentiation has been made between the 3 types of enterprises whose operation entails metal use in the production process. This categorization differentiates between ‘Manufacture of basic metals’ which includes foundry items, casting of different metals such as iron and steel, manufacture of sewing machine parts, packaging paper bolts and manufacture of agriculture implements of different types such as plough, chaff cutter, harrow and seed drill. Next ‘manufacturing of fabricated metal products except machinery and equipment’ includes machine parts, fabrication pullies, steel furniture, DTH rigs, wagon drills, crawler drills, mining equipments, DTH hammers and sheet metal products. Finally, ‘Manufacture of machinery and equipment’ includes manufacture of stone cutter machine, multi-cutter machine, block cutter machine, industrial machinery works, and so on. Food processing enterprise includes aquaculture enterprise. For this sample, the category ‘Crop and animal production and hunting, and related service activities’ includes only bee keeping enterprises. The other categories are self-explanatory from the names. These sectors have been chosen keeping in mind their economic significance and hence parameters such as employment, turnover, GVA (Gross value added) and export have been used to compute a ranking for these different sectors.

Sector	A. Ranking (economic significance)	B. MoEF Industry classification (w.r.t envt. degradation)	C. MoEF ranking	D. Wtd. Avg. (A*B)	No. covered
Manufacture of food products and beverages	1.25	Orange	2	2.5	24
Manufacture of Textiles	3.25	Red	1	3.25	22
Manufacture of chemicals and chemical products	4.75	Red	1	4.75	6
Manufacture of fabricated metal products except machinery & equipment	4.75	Red	1	4.75	15
Manufacture of machinery & equipment	6	Red	1	6	10
Manufacture of basic metals	7.25	Red	1	7.25	21
Other Non-metallic Mineral Products (ceramic tiles & sanitary ware, glassware, mini cement plants)	8.25	Red	1	8.25	10
Manufacture of leather and related products	12.75	Red	1	12.75	17
Manufacture of paper and paper products	16.5	Red	1	16.5	11
Manufacture of rubber and plastic products	9.25	Green	3	27.75	7
Manufacture of furniture, manufacturing, n.e.c	9.5	Green	3	28.5	4
Manufacture of electrical machinery and apparatus n.e.c.	12	Green	3	36	3
Services	NA	Green	NA	NA	4

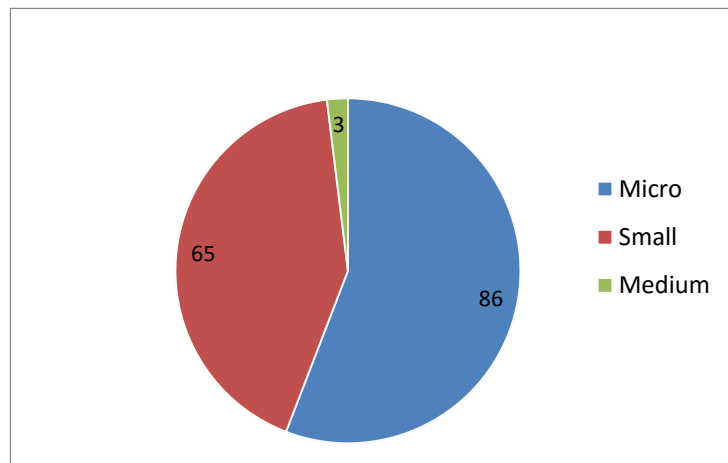
(Foundation for MSME Clusters, 2013)

The ranks assigned have been taken from 4th all India census of registered MSME units (Ministry of MSME, GoI, 2011) and hence, the lower the rank, the higher the importance. This holds for the average as well. It is clearly brought out in the matrix that sectors like food processing, manufacture of textiles, manufacture of chemicals and chemical products, manufacture of fabricated metal products except machinery & equipment, as well as, manufacture of machinery and equipment are significant both in terms of economic contribution as brought out by indicators in the matrix, as well as, they are environmentally degrading sectors in need of introduction to the path of sustainable consumption and production. These enterprises fall in ‘red’ category as per the list of Central Pollution Control Board (CPCB) classifying 64 types of polluting industries/ industrial activities as ‘Red Category’ industries on the basis of high emissions/ discharge of significant pollutants or generating hazardous wastes. ‘Foundries’, classified as ‘red’ according to CPCB (Foundation for MSME clusters, Indian Institute of Corporate Affairs, Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH, 2013), are casting units and fall into the ‘manufacture of basic metals’ sector of MSMEs as per National Industrial Classification 2004 and are also economically significant and hence have also been taken up for the purpose of this study. It is pertinent to mention here that ‘Manufacture of food products and beverages’ sector includes 5 enterprises from ‘Crop and animal production and hunting, and related service activities’ sector for the purpose of this study.

The unit size wise break up is summed up in the pie chart below.

The national picture as portrayed by 4th all India census of MSME enterprises shows that both registered and unregistered enterprises have similar break-up. In case of registered enterprises, micro enterprises comprise 94.94% of the total or 14.85 lakh units, while small and medium comprise a measly 4.89% (0.76 lakh units) and 0.17% (0.03 lakh) respectively (Ministry of MSME, GoI, 2011). Similarly, in case of unregistered enterprises, micro enterprises comprise the lion’s share at 99.83% (198.39 lakh enterprises) while small enterprises are merely 0.17% or 0.38 lakh in number (Ministry of MSME, GoI, 2011). In order to make the sample representative, maximum enterprises have been covered from the ‘micro’ category followed by small and medium respectively as brought out in the pie chart.

Figure 8: Size wise no. of units covered



Annex 4.2

Questionnaire for Enterprises MSME Scheme Assessment

Name of the Enterprise: _____

Address: _____

Email id: _____

Major Products/Services: _____

I. Awareness:

1. Which Category of enterprise do you belong to?

Micro

Small

Medium

2. Do you know the schemes offered by Government of India which can useful to you?

Yes

No

If yes, please name the schemes in the following table

#	Name the scheme	Do you know which ministry/dept offers this scheme?	Do you know where to apply for it?

3. Do you know of any scheme related to Energy (E.g. Energy Saving, Renewable energy, etc)

Yes

No

If Yes, Name the scheme _____

4. Do you know of any scheme related to Environment (E.g. Clean Production, Effluent Treatment, Pollution Control, etc)

Yes No

If Yes, Name the same _____

5. Do you know of any scheme related to Social Issues (E.g. Insurance, Health, Safety of workers, etc)

Yes No

If Yes, Name the scheme _____

6. Where did you come to know about these schemes

a) Word of Mouth

b) Newspapers

c) TV

d) Radio

e) Internet

e) Government Representatives

f) Industry association

g) Any Other: (Please specify) _____

7. Are you aware that, from where you can get scheme details and application form?

Yes No

If yes, Please name the source : _____

II. Accessibility:

1. Have you ever applied to any scheme in the last 3 financial years?

Yes No

If yes, please name the scheme _____

2. Where did you get the application form from?

3. On a scale of one to five please rate the following (starting from one being the poorest and five being excellent)

3.1	Application Process	1	2	3	4	5
3.2	Understanding the Guidelines	1	2	3	4	5
3.3	Turn-around time (time taken for processing of the application)	1	2	3	4	5
3.4	Support provided in accessing the scheme (Hand-holding)	1	2	3	4	5
3.5	For credit linked scheme (e.g. CLCSS, CGTMSE) getting credit & other benefits	1	2	3	4	5

III. Usefulness:

1. On a scale of one to five please rate the following (starting from one being the poorest and five being excellent)

1.1	Sufficiency of value (grant amount) offered in the scheme?	1	2	3	4	5
1.2	The Services (activities supported) offered through the scheme	1	2	3	4	5

IV. Need for Support:

1. Please mention 3 major needs of your enterprise in order of priority. (Needs for which assistance is required)

1. _____

2. _____

3. _____

2. Is there any specific need related to Energy (E.g. Energy Saving measures, Renewable energy, etc)

Yes

No

If Yes, Please specify _____

3. Is there any specific need related to Environment (E.g. Clean Production, Effluent Treatment etc)

Yes

No

If Yes, Please specify _____

4. Is there any specific need related to Social Issues (E.g. Insurance, Safety)

Yes

No

If Yes, Please specify _____

5. Remarks (if any)

V. Sustainability related concerns

1) Do you have any of the following concerns about sustainability in your business/industry?

Energy inefficiency (e.g. quantity of coke/ electricity/ any other fuel used for one unit of output in your unit which is higher than the industry norm)

Adverse impact on environment (air, water, soil pollution)

Over-exploitation of natural resources

Workers' health, safety and social wellbeing

Any other, please specify _____

No concerns/ not applicable

2) Do you believe that such concerns need to be addressed by you?

Yes

No

3) If Yes

i) Why do you think so?

- It will enhance business profitability
- Government regulatory compliance
- Any other, please specify _____

ii) Have you taken any corrective measures individually or collectively to address sustainability issues?

- Yes
- No

If yes, please specify _____

iii) Is it likely to be a part of your strategic planning for future?

- Yes
- No

4) Do you think use of renewable energy (e.g. Solar or biomass energy) is important in your production?

- Yes
- No

5) If yes, are you willing to invest in these renewable sources of energy?

- Yes
- No

If not, please give reasons _____

6) What support do you want from Government or your industry association for making your unit sustainable? Please specify

- Technical (support for purchase of machinery, technical training, etc)
- Financial (Grant or loan)

Date:

Signature

Thanks for your cooperation!