Draft Detailed Project Report

New Technology Centre, Baddi (General Engineering)

Technology Centre Systems Program

Report No: 2015-Delhi-0311

Submitted

To

The Office of Development Commissioner - MSME
Ministry of MSME, Govt. of India
Maulana Azad Road, New Delhi -110001

EY
Building a better working world

24 July 2015

Director (Tool Room)

Office of Development Commissioner, MSME

Ministry of MSME

Nirman Bhawan, Maulana Azad Road,

New Delhi -110108

Dear Sir,

As part of our engagement to provide Consulting services for establishment of Program Management Unit (PMU) for designing the project, undertaking the pre-project activities and providing implementation support during the course of the Technology Centre Systems Program (TCSP), we hereby submit the Draft Detailed Project Report for setting up of Technology Centre at Baddi, Himachal Pradesh for your kind perusal. The deliverable has been prepared in accordance with our engagement agreement dated 07 November 2013, and our procedures were limited to those described in that agreement.

This Detailed Project Report is based on inquiries of and discussions with:

- O/o DC MSME
- PSC
- Industry experts
- World Bank Mission
- Industries and Ancillary units
- Government Institutes and Industry association
- Secondary Research

We have not sought to confirm the accuracy of the data or the information and explanations provided by the O/o DC MSME. Our work has been limited in scope and time and we stress that more detailed procedures may reveal other issues not captured here. The procedures summarized in our Draft Detailed Project Report do not constitute an audit, a review or other form of assurance in accordance with any generally accepted auditing, review or other assurance standards, and accordingly we do not express any form of assurance. This Draft Detailed Project Report is intended solely for the information and use of the Office of DC-MSME and is not intended to be and should not be used by anyone other than this specified party.

We appreciate the cooperation and assistance provided to us during the preparation of this report. If you have any questions, please contact the undersigned.

Very truly yours,

Guru Malladi, Partner – Advisory Services

Disclaimer

This Draft Detailed Project Report for development of technology centre at Baddi as part of consulting services to establish a Programme Management Unit (PMU) for designing the project, undertaking the pre-project activities and providing implementation support during the course of the Technology Centre Systems Program (TCSP) has been prepared by Ernst & Young LLP (hereinafter referred to as 'EY' or 'Ernst & Young' or 'Us') and delivered to the 'Office of Development Commissioner - Ministry of Micro, Small & Medium Enterprise (O/o of DC-MSME)' (hereinafter referred to as 'the Client').

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Acknowledgement

We would like to express our sincere gratitude to MoMSME and its officials for their involvement and valuable inputs during the preparation of this DPR. We extend a special thanks to Shri Amarendra Sinha, IAS, (DC-MSME) and Shri R.K. Rai (Director-TR, MoMSME) for their proactive support and guidance during the entire process.

We would like to thank the GMs of existing MSME TCs for their guidance and valuable inputs during preparation of the DPR.

We would like to convey our sincere thanks to officials of Barotiwala Nalagarh Industries Association (BBNIA) and MSME-DI, Solan for their support during the on site visit for the proposed Technology Centre at Baddi.

Also, we must extend our sincere thanks to all the stakeholders like OEMs, Tier I & II suppliers, industry associations, Government Institutes and ancillary units who gave us their valuable time and insights with respect to various dimensions of the tooling industry and its support requirements. Without their help, capturing of the industry requirements would not have been possible.

Abbreviations

AICTE	All India council for technical education
CAD	Computer-aided design
CAE	Computer-aided engineering
CAM	Computer-aided manufacturing
CCNA	Cisco certified network associate
CDGI	Centre for development of glass industries
CEMILAC	Centre for military airworthiness & certification
CFC	Common facility centre
CFTI	Central footwear training institute
CIHT	Central institute of hand tools
CITD	Central Institute of tool design
CNC	Computerized numerical control
CNM	Cluster network manager
CSIR	Council of scientific and industrial research
CTR	Commercial tool rooms
CTTC	Central tool room & training centre
DC	Development commissioner
DRDO	District rural development authority
EDM	Electrical discharge machining
ESDM	Electronics system design and manufacturing
ESTC	Electronics service & training centre
FFDC	Fragrance & flavour development centre
FRP	Fibre reinforced plastic
GDP	Gross domestic product
GIZ	Gesellschaft für Internationale Zusammenarbeit
GoI	Government of India
IDCO	Industrial infrastructure development corporation
IDEMI	Institute for design of electrical measuring instruments
IDTR	Indo Danish tool room
IGTR	Indo German tool room
IISc	Indian institute of science
IMFA	Indian metals and ferro alloys
ITI	Industrial training institute
ITSP	It service provider
KPI	Key performance indicator
LCA	Light combat aircraft
LRU	Line-replaceable unit
MOU	Memorandum of understanding
MSME	Ministry of Micro, Small & Medium Enterprises
NCVT	National council for vocational training
OEM	Original equipment manufacturer
PDO	Program's development objective
PMC	Project management consultant

PMU	Program management unit
PPDC	Process and product development centre
RFD	Result framework document
SMED	Single minute exchange of dies
TAGMA	Tool & gauge manufacturers association of India
TCs	Technology centres
TCSP	Technology centres systems programme
TDC	Technology development centres
TP	Technology partner
TR	Tool room
TRTC	Tool room & training centre
UNIDO	United nations industrial development organization
VLSI	Very-large-scale integration

Revision History

Version	Issue date	Amendment description	Prepared by	Reviewed by
1.0	10 June 2015	Changes incorporated in as discussed with Dinesh Pradhan	Rajkumar Deegwal Ayesha Ghoshal	Dinesh Pradhan
2.0	17 July 2015	Changes incorporated in as discussed with Dinesh Pradhan	Rajkumar Deegwal Aliya Bhandari	Dinesh Pradhan Utsav Mishra
3.0	23 July 2015	Changes incorporated in as discussed with Utsav Mishra	Rajkumar Deegwal	Utsav Mishra

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Executive Summary

The proposed Technology Centre (TC) under Ministry of MSME's Technology Centre Systems Programme (TCSP) at Baddi in Solan district of Himachal Pradesh will play an important role in enhancing the competitiveness of MSME units in the region. It will focus on improving access to technology, providing skill up-gradation and offering advisory support to the MSMEs with high growth potential.

Baddi is strategically located along the industrial corridor that stretches from Barotiwala to Nalagarh which is the biggest industrial belt of Himachal Pradesh and growing at a fast pace. Good connectivity with other districts of Himachal and easy access to Punjab, Haryana and Delhi has been one of the key attraction factors for enterprises to setup their plants in the region. Presence of wide range of industries such as General Engineering, Automobile, Pharmaceuticals, FMCG etc. is contributing to industrial growth of the region.

The objective of this DPR is to evaluate feasibility of the proposed new MSME TC at Baddi. This includes assessment of the market need in the region, requirement of technology and skillset, requirement of investment and regulatory approvals etc. for developing a green field TC at Baddi. This DPR has been prepared in consultation with relevant stakeholders including O/o DC-MSME, Government of Himachal Pradesh, MSME-DI (Solan), Department of Industries, OEMs, Tier I & II suppliers, Barotiwala Baddi Nalagarh Industries Association (BBNIA), industry associations, Government Institutes and ancillary units in the region.

1 STAKEHOLDER DISCUSSION: Discussions with various stakeholders were carried out to develop a better understanding of the requirements and expectations from the proposed Technology Centre. Market opportunity assessment was undertaken to understand the tooling and training demand in general engineering sector across segments in the various stages of manufacturing. Stakeholders were consulted in the Baddi, Nalagarh, Parwanoo, and Una region to gain insights with respect to the tooling and training requirements in the region during the preparation of the DPR. Also several brainstorming sessions were carried out with the O/o DC-MSME, World Bank and domain experts to identify the focus sectors for the proposed TC.

2 OPPORTUNITY ASSESSMENT: Presence of fabricators, Auto parts suppliers, packaging industry and other engineering units provide an opportunity for the TC to serve as a general engineering technology centre. Significant investment in Automobile, Hydro-power, IT, energy and pharma sectors will be supported by the presence of the TC. Baddi represents half of the total

MSMEs in Solan district which has presence of 7 industrial zones such as Parwanoo, Chambaghat and Banalgi.

The market opportunity for this region has been assessed with respect to three major areas: market in core sectors in the catchment, market in other potential sectors (incl. processing, sheet metal components, plastic components, engineering components etc.) in catchment and market outside catchment area.

3 FOCUS AREA FOR THE TC

The tooling requirement for the General Engg. industry primarily can be divided into four categories: plastic moulds, pressure-die casting, sheet metal and forging tools. Sheet metal and plastic mould in general engineering sector comprise majority of the tooling requirement in the region and would be the focus areas for the TC. The TC will support MSMEs through production, training and advisory support.

(A) Production

- Tool, die Jigs & fixtures and Job work requirement for the large and small firms in the catchment area shall be addressed by the TC. Lack of availability of high end machines with large size provides an opportunity for the TC. Industries like Automobiles, engineering firms, Packaging, pharma and other mineral based industries can benefit from the latest technology available at the TC
- Plastic moulds is another major area of tooling in plastic products and packaging industry.
- Testing and certification is key requirement of the MSMEs in the region as a testing certificate is necessary to sell products to large firms. Chemical, mechanical and metallurgy testing facility at the TC can bridge this gap for MSMEs. Packaging and mineral based firms will be the key beneficiary of the facility.

(B) Training

The TC will provide professional training in various courses with focus on tool and die making and automation. The TC will contribute towards skilling youth (around 17,000 to 18,000 trainees in next five years) to make them employable in industry by designing courses relevant to them. Major specialisations include: Process automation in FMCG and pharmaceuticals, Tool making and metal cutting, Maintenance, CNC Manufacturing, CAD/ CAM, Advance Welding, Information Technology, Training on Testing, Industrial Automation.

(C) Consulting

Going forward, revenue is proposed from consultancy / advisory streams including support to MSME clusters in technology and engineering solutions and for improvement of their quality systems and productivity. The TC will have a dedicated professional wing to assist MSMEs in the field of tool design, manufacturing, quality/ productivity improvement and innovation.

(D) Other Areas

The objective of the proposed TC is to provide support to commercial TRs and MSMEs. For this in addition to the above mentioned areas, the TC will also form consortium with MSMEs including commercial TRs to jointly cater to the focus sectors, form Productivity and Quality club for cluster of engineering industry and support them.

Tc will also have an entrepreneur development cell focusing on long term course students. Entrepreneur Development Cell at the TC provides awareness, motivation, education and support to the students who have an inclination towards entrepreneurship. This would also include interactions with FIs/ banks, tax consultants and assistance in accounting, finance, marketing aspects.

To achieve these goals the TP and CNM will assist the TC for providing technology support and facilitating market linkages respectively.

4 FINANCIALS: The revenue and cost projections have been made for a period of 10 years. The total capital expenditure for the proposed TC is estimated at about INR 10,232 lakhs. The capex includes expenditure towards plant & machinery, development of civil and other associated infrastructure. The revenue is projected to grow from INR 105 lakhs in 2016-17 to INR 3,544 lakhs by year 2025-26. The overall project internal rate of return (IRR) is estimated to be 10.7%. The detailed projections have been provided in the financial analysis section (Chapter13).

All the initiatives mentioned above for the proposed TC would not only strengthen the expertise of MSMEs in manufacturing but also help to develop a sustainable ecosystem for MSMEs in the region in the long run.

Introduction

1. Introduction

1.1. Background and project rationale

India is one of the largest and dynamic emerging markets with vast economic potential. India's GDP in 2012 was USD 1,872,000 Million ranking 10th amongst all countries[1]. The objective of the Government of India's, 12th Five-Year Plan (2012-2017) is to return to GDP growth rates in excess of 8 percent, with strong emphasis on the manufacturing sector. Manufacturing has long been recognized as an essential driver of economic development for most countries, as it has an important economic and employment multiplier effect. The manufacturing sector will have to play an important role to take Indian economy to a high growth rate trajectory and achieve the planned objectives. MSMEs play an essential role in the overall industrial economy of the country and account for over 45% of India's manufacturing output[2].

Despite strong potential, India's manufacturing performance has not been encouraging. The share of manufacturing in India's GDP has stagnated at around 16 percent[3], compared to more than 30 percent (and growing) in some of the other Asian countries. India's manufacturing sector has been facing challenges, such as low value addition, low productivity, and less-than-desirable up scaling. However, world-class production units that compete in the international market are observed in the automotive sector.

The major constraints in the growth and competitiveness of India's manufacturing sector are:

- Difficulties in accessing markets (including within India),
- Difficulties in accessing finance (especially for MSMEs),
- Infrastructure deficiencies and
- Difficulties for MSMEs to access technology and lack of skilled manpower.

These constraints impact the competitiveness of MSMEs operating in both upstream and downstream manufacturing industries.

Upstream industries, such as the tooling industry, which consists of developing and manufacturing of dies, moulds, casts, as well as testing and prototyping, serves as an interface between product design and product manufacturing. The right tools help increase throughputs, reduce material waste, improve product quality, time to market and thus improve competitiveness. The importance of the tooling industry increases with accelerating technological developments, product sophistication/ innovation/ customization and reducing time to market. Tooling is a specialized but local industry (more than 60 percent of tools in the world are locally produced and consumed –

[1] http://unstats.un.org/unsd/snaama/dnltransfer.asp?fID=2
[2] http://www.dnb.co.in/Nashik2013/PDF/MSMEsInIndia.pdf
[3] The Manufacturing plan - Strategies for accelerating growth of manufacturing in India in the 12th Five Year Plan and beyond

including in India) dominated by MSMEs (more than 80% of firms in India, Europe, US and Japan). As in other countries, the private tooling industry in India has grown hand in hand with the manufacturing industry. The turnover of the Indian tooling industry is approximately INR 13,000 crores, with more than a thousand firms employing over 120,000 workers (TAGMA 2011). The constraints to the growth and competitiveness of the Indian tooling industry mirror the ones affecting manufacturing as a whole, as articulated above. The scarcity of skilled workers and problems related to their retention, as well as the lack of access to a high-quality design and prototyping facility has hurt growth.

In downstream industries such as automotive, electronics, fragrance and flavours, glass, leather, toys etc., there is shortage of skilled labour and limited access to advanced technologies. These industries include large numbers of MSMEs, often working as part of supplier networks of larger enterprises and subject to increase international competition.

1.1.1. Demographic overview and challenges

While India stands to benefit from an immense demographic dividend (with the largest youth population in the world; around 66 percent of the total population is under the age of 35), it has an overall employment rate of 4.7 percent (under usual principal status approach) and an overall labour force participation rate of 50.9 percent[4] . For the country to gain from this demographic dividend, skilling and up-skilling its youth are key priorities for the Government of India (GoI).

India has a labour force of about 470 million, of which less than 10 percent has received skills training, either through formal or informal means[5]. About 13 million young people enter the labour force annually. Despite the huge expansion of skills training provision during the 11th Five-year plan, the country's skills development system requires massive up scaling. In its 11th and 12th Five-year plans, India recognized that skill development is critical to achieve faster, sustainable and inclusive growth on one hand, and to provide decent employment opportunities to the growing young population, on the other hand. According to the National Skill Development Policy published in March 2009, India had set a target of skilling 500 million people by 2022[6]. This program will play a bigger role in the country's plan by setting a target of skilling 150 lakh people within the next 6 years.

Global experience shows that a workforce with higher education and skill levels leads to higher productivity and personal income. A 2011 study showed that students who attended three-year vocational training courses at ITIs earned 25 percent more than two-year course students, who

[4] Report on the Third-Annual employment & unemployment survey (2012 – 2013) of the Ministry of Labor, Government of India.
[5] 11th and 12th Five Year Plan
[6] http://labour.nic.in/upload/uploadfiles/files/Policies/NationalSkillDevelopmentPolicyMar09.pdf

earned 14 percent more than did one-year course students[7]. These results were confirmed in a 2007 study showing that the returns on vocational training in India have been found to be 8 percent, almost equivalent to the 8.4 percent related to an additional year of education. The same study showed that increased educational attainment by one year is associated with 5.8 percent higher firm-level productivity in India[8].

1.1.2. Country's manufacturing objectives

Development of Indian manufacturing sector calls for deepening and recalibrating of economic reforms that would strengthen the sector and make it grow faster and become an engine of inclusive growth. To realize the potential of the manufacturing sector, Government of India had announced National Manufacturing Policy in 2011 with the objective of enhancing the share of manufacturing in GDP to 25% within a decade and creating 100 million jobs. It also seeks to empower rural youth by imparting necessary skill sets to make them employable. Sustainable development is integral to the spirit of the policy and technological value addition in manufacturing has received special focus.

The National Manufacturing Policy has six objectives:

- Increase manufacturing sector growth to 12-14% over the medium term to make it the engine of growth for the economy. The 2 to 4 % differential over the medium term growth rate of the overall economy will enable manufacturing to contribute at least 25% of the National GDP by 2022.
- Increase the rate of job creation in manufacturing to create 100 million additional jobs by 2022.
- Creation of appropriate skill sets among the rural migrant and urban poor to make growth inclusive.
- Increase domestic value addition and technological depth in manufacturing.
- Enhance global competitiveness of Indian manufacturing through appropriate policy support.
- Ensure sustainability of growth, particularly with regard to the environment including energy efficiency, optimal utilization of natural resources and restoration of damaged/ degraded eco-systems.

[7] Vocational Training in the Private Sector (Goyal 2011)
[8] The Knowledge Economy and Education and Training in South Asia (world Bank 2007)

1.1.3. Recommendations of XII plan working group & Parliamentary standing committee

At present, the Office of Development Commissioner [O/o DC (MSME)], Ministry of Micro, Small and Medium Enterprises, operates 10 TRs and 8 TDCs (both hereinafter called as TCs) spread across the country. The TCs have been providing technical and vocational training programmes to more than 1, 00,000 trainees annually including AICTE and NCVT approved certification. They also provide design and manufacturing support to entrepreneurs alongside technical consultancies. The T Cs' primary focus is to improve access to advanced technologies, provide technical advisory support to entrepreneurs and workers, and offer opportunities for technical skill development to the youth at varying levels. The variance in levels of training itself is demonstrative of a wide spectrum of technical sophistication in training inputs.

Considering the performance of existing TCs, the Department related Parliamentary Standing Committee on Industry, in its 235th report submitted to Rajya Sabha on 04th May2012 have recommended as follows:

i) "The committee is impressed with the performance of the TRs established by the MSME Ministry. These enable the youth to improve their skills and get employment opportunities. The success of such TRs inspires confidence that establishment of more such institutions will equip the young people with necessary ability useful in the expanding market and manufacturing sector".

ii) "The Committee strongly recommends that more money must be allocated for establishment of TRs across the country. It is understood that MSME Ministry is also approaching the concerned organizations within Government to get loan from International Financial Institutions. If Planning Commission and Finance Ministry cannot allocate more funds for this purpose, the necessary permission to MSME Ministry to get access to borrowings from international banks may be given without delay. However, it is strongly recommended that we must use our own resources for this cause, which is good for the youth of our country and MSME sector".

The evaluation of existing ten TRs was undertaken under GIZ–MSME Umbrella Programme during 2011. The experts have appreciated the performance of the existing TCs and have recommended expansion of skill development activities and introduction of newer technologies in the TCs.

Hon'ble Finance Minister on 28th Feb2013, in his budget speech 2013-14 has made following announcement:

Para 75: "TRs and TDCs set up by the Ministry of MSME have done well in extending technology and design support to small businesses. I propose to provide with World Bank assistance, a sum of Rs.2200 crores during the 12th Five Year Plan period to set up 15 additional Centres".

In pursuance of (i) the Finance Minister's announcement through his Budget speech (2013-14), (ii) the recommendations of the Department Related Parliamentary Standing Committee on Industry in its 235th Report submitted to Parliament (Rajya Sabha) on 4th May 2012, and (iii) the recommendations of the experts after evaluating the performance of existing TCs, it was proposed to implement "Technology Centre Systems Programme (TCSP)" at an estimated project cost of Rs.2,200 crores including World Bank assistance of USD 200 million by setting up 15 new TCs and to modernize / upgrade existing TCs by introducing latest machinery / technologies.

1.1.4. Technology Centres System Program

The Technology Centres System Program, a national program, seeks to develop the technological and skill base of MSMEs in selected manufacturing industries, via upgraded and new TCs (currently called TRs and TDCs) has been envisaged. The TC's mission will be to improve the competitiveness of MSMEs across India – with a strong emphasis on low income states.

This will be achieved by providing an integrated suite of services to MSMEs on a fee basis, ranging from providing them access to technology, access to skills and access to business advisory services. TCSP will reinforce the technical capability of the TCs as well as their performance, by further increasing the participation of the private sector in key decisions at both the national and local levels.

The TCs will support industry clusters across manufacturing value chains, both upstream (tooling industry) and downstream (key industries exposed to global competition close to the technology frontier, such as the automotive and electronics sectors, as well as industries evolving through indigenous innovations, such as fragrance and flavour, glass, leather, toys etc.).

The PDO has been defined to enhance the competitiveness of MSMEs by improving their access to technology and business advisory services as well as skilled workers through systems of financially sustainable TCs. The program seeks to establish 15 new TCs and upgrade technological capabilities of the existing TCs and develop linkages between MSMEs, Indian and international research institutes and leading manufacturers. The program will connect leading practices that will contribute to advance technology, knowledge, skilling and innovation that can be transferred to MSMEs served by each TC.

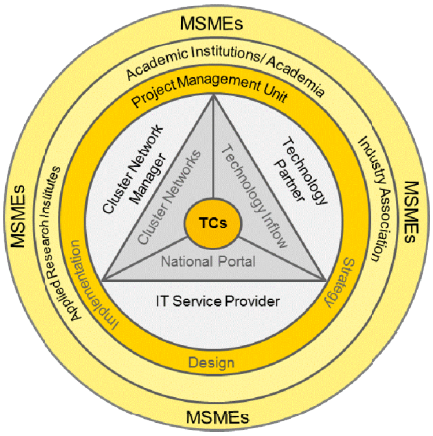
The competitiveness of MSMEs is impacted by various factors such as entrepreneurial drive of the leader, market and customer dynamics, their access to technology, finance & business advisory and availability of skill manpower. The TCs will shape the outcomes of the program by providing MSMEs

access to technology, business advisory and skilled manpower. So it would be possible to measure the success of this program by measuring the offtake of these paid services of the TCs by MSMEs. Therefore, the key indicators that will be measured are;

- Number of enterprises paying for the services of the TCs.
- Number of long term trainees employed by industry, including MSMEs, within six months after being trained at TCs.
- Profit of TCs before depreciation and land.

In addition, intermediate result indicators are designed to monitor critical progress towards achievement of the PDO with primary emphasis on market-tested outputs of the TCs supported by TP and CNM. Examples of such indicators include capacity utilization of machines; trainees trained access to services by MSMEs, number of technology strategies / roadmaps developed by TPs and endorsed by industry associations and value of TCs' businesses generated with support of CNMs.

Figure 1: TCSP eco-system



This program will help MSMEs in key industries become more competitive by acquiring improved technology and employing better skilled workers. This will be done directly through the services provided to them by the TCs, as well as indirectly through their linkages with larger firms (e.g. as part of the supplier network of an OEM), which will have access to the services of the TCs under the condition that it benefits their suppliers. The TCs will contribute by providing inputs to MSMEs on manufacturing technology & business advisory and by improving the skills of workers/ skill seekers who can gain better employment opportunities. The program will therefore benefit the Indian MSMEs, students and workers and help establish systems of TCs in the country where each centre will gain from the specialisation and experience of the other and improve the competiveness of MSMEs.

1.1.5. Key TCSP stakeholders

TCSP has multiple stakeholders who will need to work together to achieve the objective to enhance the competitiveness of MSMEs by improving their access to technology and business advisory services as well as skilled workers through systems of financially sustainable TCs. The key players who will participate in the program include:

- Beneficiaries

MSME units will be the prime beneficiaries of the program and the overall objective of the program centres around providing them with access to modern technology, access to business advisory services and access to skilled workforce. Workers, job and skill seekers will also gain from this

program with access to short term and long term training/ skill development courses which will help them in improving their career prospects and finding livelihood.

- Office of Development Commissioner, Ministry of MSME (DC-MoMSME)

The program would be designed and implemented under the aegis of the O/o Development Commissioner MSME, Government of India.

- Technology centres

The TCs will act as the medium through which the services of the MSMEs - integrated suite of services on a fee basis, ranging from providing them access to technology, access to skills and access to business advisory services. The program will focus on upgraded select existing TCs and 15 new TCs that support or will support industry clusters across manufacturing value chains, both upstream (tooling industry) and downstream (key industries exposed to global competition close to technology frontier, such as automotive electronics, as well as industries evolving through indigenous innovations, such as fragrances and flavours, footwear, glassware, toys etc.).

- Industry associations, academia, applied research institutes and others

Strategic collaborations between TCs and various other organizations will be critical to foster research and development, idea incubation and strengthen the TCs with regard to manufacturing services, business advisory and training capabilities. These include:

- Regional / sectorial industry associations representing MSMEs.
- Regional / national level engineering/ academic / vocational training institutions.
- Applied research institutes.
- Local regional colleges.
- Autonomous institutes such as IISc, CSIR.
- Academia.

Leading practices from around the world for similar program suggest and underscore the importance of establishing such linkages. In the Indian context, there are many research oriented projects and concepts that can provide competitive advantage to Indian industry once the early state research emanating from applied research institutes and academia can be validated and implemented at the TC through such collaborations. The TCs will provide a unique environment of bringing the country's leading academics, engineering and industry professionals together to develop and demonstrate new technologies on an industrial scale. This will allow the clients of TCs to develop new manufacturing processes in a safe, neutral setting, reducing the associated financial risks.

- Program management unit (PMU)

The PMU will assist the O/o DC MSME in designing and implementing this program. This will include developing framework for identifying sites/sectors for the new TCs, developing detailed project report, support in procurement of services and EPC contracts; developing and implementing environment and social safeguards, monitoring and evaluation, manage the roll out of the national portal, deployment of subject matter expertise and overall program management for TCSP over 6 years. EY LLP has been appointed as the PMU for the TCSP by the O/o DC MSME.

- Technology partner (TP)

The TP will help enhance the supply side of the TC by augmenting the technologies at the TCs, assist in their capacity building with respect to the identified technologies and clusters and provide greater support to the services being offered to the MSMEs by the TCs. These services include being exposed to the potential impact of new and relevant technologies, learning how to use new technologies/equipment, providing access to cutting-edge equipment, developing and testing new products, consultancy, training and deploying efficient techniques and practices that improve the competitiveness of the MSMEs being served.

- Cluster network manager (CNM)

The CNM will assist the TCs on the demand side by enhancing the economic development cooperation of key stakeholders to improve cluster competitiveness. This includes strengthening the market linkages of the TCs with the MSME cluster it serves, trade and industry associations, the academia, educational institutions, business development service providers, other government support institutions, workers and skill seekers.

- IT service provider (ITSP)

The IT Service provider will be responsible for designing, developing, setting up, operating and maintaining the IT platform for MSMEs. The IT platform will act as a common platform for services that will be required by an MSME from the start of their business, to successful operations and closure e.g. access to regulatory services for entrepreneurs, assistance for financing, access to list of suppliers etc. The platform will extend the reach of the program to its remote beneficiaries well beyond the TCs' physical location through access to e-learning solutions, B2B service and product market place, e-recruitment, assistance for financial services and e-governance services (forum to address grievances, automation of customer facing operations of the O/o DC MSME) on paid basis.

1.1.6. RFD of TCSP

For monitoring the program outcomes, RFD has been defined; which tabulates the results indicators at the PDO level and intermediate outcome level together with the baselines and targets over the life of the program. Intermediate results indicators are designed to monitor critical progress toward

achievement of the PDO with primary emphasis on market-tested outputs of the TCs and other stakeholders of the TCSP (viz. TPs, CNMs and ITP service provider).

Active participation of Managing Director/ General Manager of CTTC will be essential to steer the operationalization of TCSP in line with the envisioned mandate. The key success parameters of the Managing Director/ General Manager include:

- Revenue earned: Production, training, consultancy and others,
- Recovery ratio: Revenue/ recurring expenditure (cash) in percentage,
- Profit before depreciation,
- Profit after depreciation,
- No of trainees trained - Long term, short term,
- No of enterprises assisted,
- No of MSMEs out of above total enterprises,
- Present technical papers showing successes delivered and how it has aided industry.

TCSP's objective is to enhance the productivity of MSMEs by improving their access to technology, business advisory services as well as skilled workers through systems of financially sustainable TCs. The table below depicts the result indicators which form a part of the RFD.

Table 1: Result indicators of the RFD

Program development objective indicators		Number of enterprises paying for the services of TCs
		Number of long term trainees employed by industry, including MSMEs, six months after graduating from the TCs
		TCs' gross profit before depreciation (not including land)
Intermediary Results		
Component 1- Technical assistance to the existing and new TCs	Access to technology	Revenue of TCs from access to technology activities (production support and consultancy)
		Capacity utilization of machines in TCs
		No. of technology strategies/roadmaps developed by TPs and endorsed by industry associations and IC
	Access to skilled workforce	Number of trainees trained (direct program beneficiary)
		Number of skills development contents (e.g. curricula, standards, certifications) developed and adopted by industry associations, and/or certifying agencies
	Access to business advisory	Number of needs assessment and business plans developed by CNMs and endorsed by Industry Assocs.
		Value of TCs' businesses generated with support of Cluster Network Managers
		Number of users of IT Platform
Component 2-Investments to upgrade existing and develop new TCs		Number of new TCs built

The detailed RFD has been annexed to this report.

The program will have direct and indirect industrial and economic outcomes to the country, such as enhanced manufacturing competitiveness, improvement in the overall employment rate and increased GDP growth.

1.2. Existing MSME TCs and feedback on other TRs

Out of the currently operational eighteen TCs & TRs, ten are for the tooling industry and eight are for other industries such as ESDM (electronics system design and manufacturing), glass, footwear, and fragrance and flavour industries etc. Half of these eighteen TCs are located in low income states (Uttar Pradesh, Madhya Pradesh, Odisha, Jharkhand and Assam). The TCs are self-sufficient institutions that provide training, manufacturing and consulting services to MSMEs and OEMs. They have created a niche in the market in various fields such as hand tools, plastics, automotive, lean production etc.

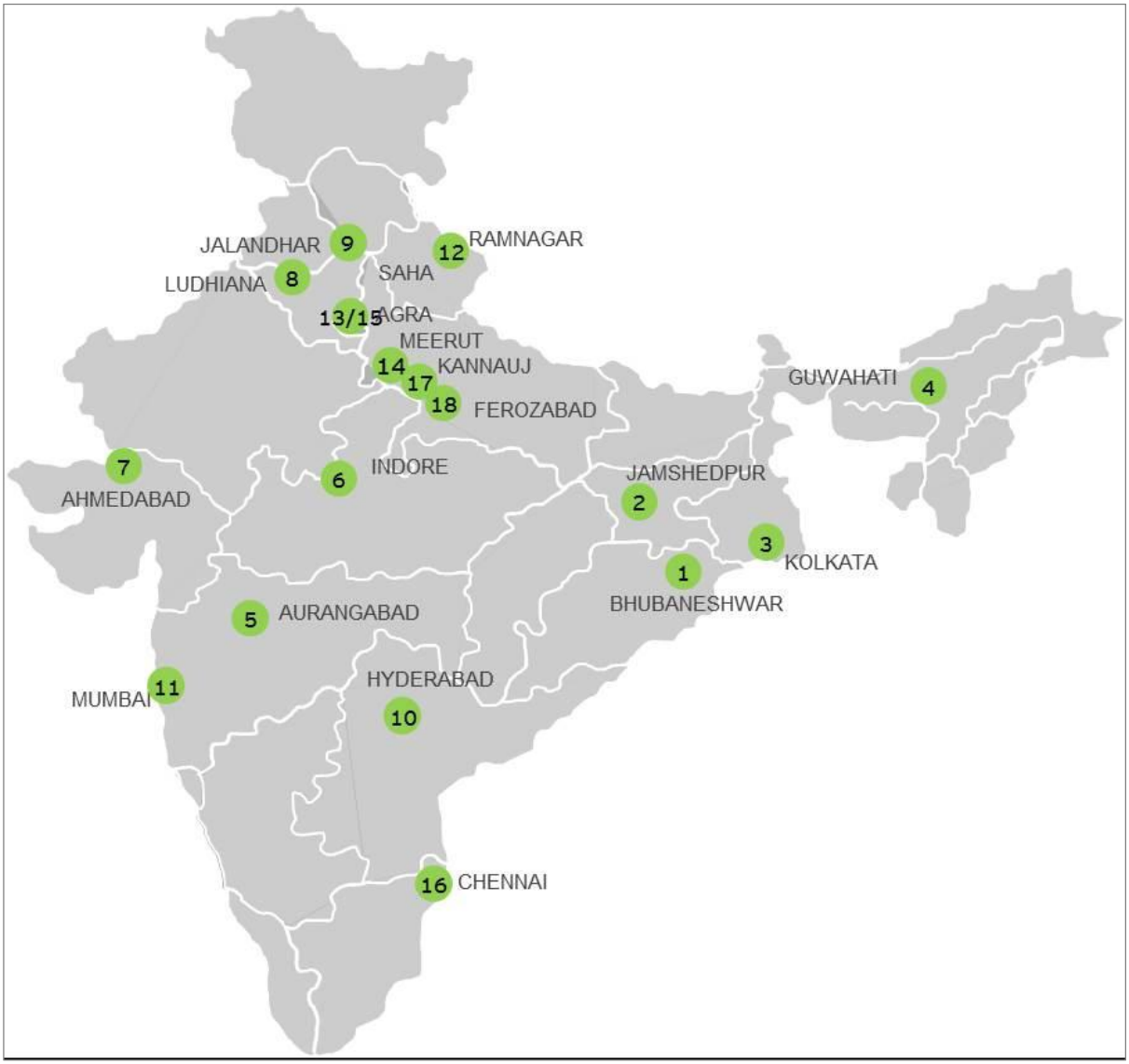
The list of the existing TCs & TRs along with their specializations is given below:

Table 2: Existing TCs & TRs along with their specializations

S. No.	Name	Specialization
1	Central Tool Room & Training Centre (CTTC), Bhubaneswar (Odisha)	Tooling, precision manufacturing and training
2	Indo Danish Tool Room (IDTR), Jamshedpur (Jharkhand)	Tooling (specialization in automotive) & training
3	Central Tool Room & Training Centre (CTTC), Kolkata (West Bengal)	Tooling & training
4	Tool Room & Training Centre (TRTC), Guwahati (Assam)	Tooling & training
5	Indo German Tool Room (IGTR), Aurangabad (Maharashtra)	Tooling (specialization in automotive) & training
6	Indo German Tool Room (IGTR), Indore (Madhya Pradesh)	Tooling (specialization in automotive and plastics, contributing to medical) & training
7	Indo German Tool Room (IGTR), Ahmedabad (Gujarat)	Tooling (specialization in plastics, contributing to automotive) & Training
8	Central Tool Room (CTR), Ludhiana (Punjab)	Tooling & training
9	Central Institute of Hand Tools (CIHT), Jalandhar (Punjab)	Tooling (specialization in hand tools)
10	Central Institute of Tool Design (CITD), Hyderabad, (Andhra Pradesh)	Tooling & training
11	Institute for Design of Electrical Measuring Instruments (IDEMI), Mumbai, (Maharashtra)	ESDM, tooling and training
12	Electronics Service & Training Centre (ESTC), Ramnagar (Uttarakhand)	ESDM and training
13	Process and Product Development Centre (PPDC), Agra (Uttar Pradesh)	Foundry & forging and training
14	Process cum Product Development Centre (PPDC), Meerut (Uttar Pradesh)	Sports goods and training
15	Central Footwear Training Institute (CFTI), Agra (Uttar Pradesh)	Leather footwear & training
16	Central Footwear Training Institute (CFTI), Chennai (Tamil Nadu)	Leather footwear & training

S. No.	Name	Specialization
17	Fragrance & Flavour Development Centre (FFDC), Kannauj (Uttar Pradesh)	Fragrance & flavours and training
18	Centre for Development of Glass Industries (CDGI), Firozabad (Uttar Pradesh)	Glass and training

Figure 2: Location of existing TRs & TCs



Several of these were set up through support from German and Danish Government under bilateral agreements as well as with the UNIDO. These TCs are largely self-sustaining entities that have been providing technical and vocational training programs to more than 1, 00,000 trainees annually. Some of these include certificate training programs certified by the AICTE and NCVT. They also provide design and manufacturing support to entrepreneurs alongside technical consultancies.

The existing TC's, were set up between 1967 and 1999, with primarily focus on improving access to technologies and providing technical advisory support for entrepreneurs in the given industry

cluster they serve. These TCs also serve workers and youth by offering opportunities for hands-on technical training and skill development in varied trades with a view to improve employability and livelihood opportunities.

The key services offered by the TCs mainly include:

a) Design & manufacturing
   - Design & Manufacturing of Tools, dies, moulds and precision tools,
   - Process Development,
   - Product Development.

b) Skill development
   - Long & short term training programs,
   - Areas include Too and die making, CAD, CAM, CNC, automation, RPT, mechatronics,welding etc.,
   - International, modular and customised programs,
   - Varies from school drop outs to HSC/SSC/10th passed outs to ITI passed outs to diploma holders to graduate engineers.

c) Consultancy
   - Inspection & calibration facilities,
   - Turnkey assignments,
   - Course curriculum developments.

Over the last few years, financial performance of the TCs has markedly improved. Most of them have experienced strong revenue growth (mostly due to training activities) and have achieved financial sustainability (before depreciation and land costs).

Some of the preliminary findings from the analysis show:

a) High profitability in recent years: There has been an improvement in recovery ratio of these TCs, thus allowing them to progress towards their self-sustainability mandate. Each of these 8 MSME TRs has become profitable in the last two years. From our discussions, we understand that IGTR Indore and CTR Ludhiana were not profitable in recent years, however, these centres have also corrected their recovery rates in 2012-13. In addition to these institutes, some of the other institutes are yet to reach the recovery ratio of 100%.

b) Skew towards training: Training and skill developed services have been a key revenue sources for the TCs. The scope of manufacturing needs to be up-scaled to achieve a balance in operations and revenues from each TC. Ideally, revenues should be balanced between the two main sources of income for the TCs. Only IGTR Aurangabad is found to be closely

balanced. CITD Hyderabad and CTTC Kolkata, although profitable, need to perhaps enhance their production activities.

c) Focus of production activities is more towards job work or component production: It was found that the utilisation of machines in the production area was focused on component production and facilities for designing, die casting or tooling were not being fully utilized. CTTC Bhubaneswar and IDTR Jamshedpur focus on component production while CTR Ludhiana on job work and IGTR Indore and CTTC Kolkata on jigs and fixtures. Only IGTR Aurangabad and CITD Hyderabad were found to focus on specialization in production, including designing, such as die casting and sheet metal or press tooling.

d) Training capacity is well utilized: As reflected in the sources of revenue generation, the scale of training activities has been growing. All TCs initially reviewed, demonstrated an increase in training numbers from 2011-12 to 2012-13. The highest increase was observed at IGTR Ahmedabad while the least was observed in IGTR Indore. Although this is a positive trend, the staff at these TCs needs to focus on production and maintain a balance between these two activities, while also up scaling other activities like consultancy and product testing. The centres should also seek avenues for taking advantage of government sponsored schemes and subsequently train more technicians in welding, machining and in automation

1.3. Evaluation study of TCs and recommendations of the experts

A study of selected MSME TRs in India on *'Strategic Assessment and Recommendations'* has been submitted under the '*Micro, Small and Medium Enterprises Umbrella Programme'*. The purpose of the study was to make comparison of the TRs with international TR programmes. An integrated set of ten recommendations have been made to increase the impact of the TR programme - reducing constraints to manufacturing MSME growth which are as follows:

- Scale up training to meet market demand - TCs should contribute trainees in greater numbers. The gap in the supply of advanced manufacturing skills will systematically reduce.
- Support private tooling sector to mature to excellence - Besides 10 government TRs, hundreds of private TRs contribute to increased manufacturing MSME competitiveness by providing more complex tools at lower prices.
- Speed up absorption of advanced manufacturing technology - Increased numbers of MSMEs will be able to access advanced technologies which enables them to secure larger contracts at better margins.
- Engage in strategic partnerships - Partnerships with large manufacturers can help realise large scale opportunities for manufacturing MSME. TCs can benefit from large scale and long lasting demand for services and increased revenue.

- Systematically build and leverage networks of capacities - The TCs should build a network of collaborating stakeholders to support the TCs to unlock more opportunities. Sub-contractors can enable TRs to expand the scale and scope of their services.
- Re-organise "business model" of government TRs- the TCs should function as autonomous business units with increased powers and accountability, increase job enrichment and control over own wellbeing. These teams are likely to become more motivated, innovative, leaner and more responsive to customers.
- Map out the TRs role in the local innovation system - TCs can benefit from integration with the local innovation system. Increased opportunity will result from increased stakeholder awareness and support.
- Move away from hierarchy to network governance - TCs will benefit from more autonomy which enables them to respond better to opportunities.
- Establish a strategic framework - TCs should utilise a coherent strategic framework which clearly articulates programme goals, sound economic development principles and good practices. Revised KPIs should promote sound strategy that result in greater, sustained development impact.
- Establish a strategic facilitation capacity - TCs should learn faster to achieve greater development impact. TCs should be at an international level of competitiveness.

During our discussion with TCs, it was conveyed that several studies have been undertaken by O/o DC MSME to analyse the technology capabilities and governance framework established at the existing TCs. The key findings from these studies are summarized as follows;

A study was undertaken to analyse the technology, organization and training at select MSME TRs, including CTTC Bhubaneswar in November 2012. The key findings of the analysis for CTTC Bhubaneswar are as follows:

- Technology
  - The average milling machine age is a higher compared to the reference groups,
  - Multiple machine work is not accomplished limiting the potentials in productivity,
  - The number of unproductive machines is significantly lower compared to other MSME TRs,
  - The share of set-up times is conspicuously low and is therefore subject to review,
  - The technology relevance distribution is different to other TCs, as the turning technology is an important technology for the component production,
  - The grinding technology shows potential for higher performance particularly with regard of high precision machining for aeronautical components,
  - The technology analysis shows machinery characterized by a high machine performance.

- Organization
  - Towards the customer this is compensated by a large portion of products being delivered early, – 4 out of 5 orders will reach the customer on time,
  - Late orders occur infrequently and are in line with the international competitive standard,
  - The experience, process quality, and customer focus is also represented by high customer satisfaction,
  - High manpower in the quality management department ensures the high quality of the products,
  - Quality assurance is also exercised by the departments individually to operate with process orientation,
  - The customer group can be considered focused by the standard of the other MSME TCs,
  - A short average job tenure is an indicator for future sustainability and a stable process structure,
  - CTTC Bhubaneswar successfully exploits the benefits of customer focus and product portfolio – The next step has to be undertaken by adding an electronic planning and control system

- Training
  - The development of further courses on automation and systems should be continued,
  - Even though an advanced process understanding is existent in manufacturing it is not sufficiently transferred to training,
  - The analysed courses comprehensively attend to the necessary key know-how of machine operators, programmers, and designers in the mid-term format.

The key recommendations made in the report were as follows:

- Technology
  - Holding the high machinery performance level with the help of machine investments – large size milling machines and grinding machines,
  - Rationalization and standardization of all manufacturing processes,
  - Reduction of in-machine set-up times using zero-point clamping systems and pallets,
  - Efficiency improvements by reduction of electrode milling and sink-EDM machining time by shifting to graphite electrodes.

- Organization
  - Definition of requirements to improve planning and control of the order fulfilment process by developing an electronic planning and control system.

- Training

- Development of a link between manufacturing competencies and course offerings by setting-up of course offerings addressing organizational capabilities and component manufacturing,
- Establishment of modular course structure for advanced training of industry professionals.

DPR Objective and Approach

2. DPR objective and approach

2.1. Objective

Technology Centre in Baddi has been proposed with the underlying fact and review of the catchment area which has some of the leading units in Automobile, General Engineering, Pharmaceuticals and FMCG. Further a number of transformational industrial projects in hydro-power, automobile, energy and steel sector are proposed and the TC can facilitate and support the MSME units coming up across this region. The TC at Baddi will play an important role in enhancing the competitiveness of the MSME Units in the area. TC will focus on improving access to technology, providing skill up-gradation and offering advocacy support to the MSMEs with high growth potential. The long term vision is to ensure competitiveness of the MSMEs in the eco-system by strengthening their linkages to the mainstream manufacturing sector in the region.

The objective of this DPR is to evaluate feasibility of proposed MoMSME TC at Baddi. This includes assessment of the market need in the region, technology and skillset requirement, amount of investment required, construction needed, its layout and subsequent requirements for implementation of the green field TC at Baddi. This DPR has been prepared in consultation with relevant stakeholders including O/o DC-MSME, Government of Himachal Pradesh, World Bank, OEMs, Tier I & II suppliers, industry association, Government Institutes and some ancillary units in the region. This DPR would facilitate the implementation plan of proposed TC at Baddi.

2.2. Approach

To start with, a comprehensive secondary research was carried out to understand the tooling and technological requirements of the General Engineering Sector and in particular of the Baddi region. To validate the facts, the team conducted a detailed primary research that included meetings with various key stakeholders including O/o DC-MSME, Industrial Associations and General Engineering units in the catchment and others as explained below.

Discussions with various stakeholders were carried out to develop better understanding of the requirements and expectations from the proposed TC. Leading players were met in this region to discuss and understand the various insights with respect to the tooling & other technological requirements during the preparation of the DPR. Telephonic discussions with some of the General Engineering component manufacturers and suppliers across various regions (such as Hyderabad, Bengaluru, Chennai, Aurangabad and Ahmedabad) were carried out. The objective of this primary research was to understand their business requirements, issues, challenges, and future requirements to develop a deeper understanding of the requirements that can be served by the TCSP in future.

Based on the outcomes and the results of the discussions, market opportunity assessment was undertaken to understand the tooling & technology demand in General engineering sector across various stages of manufacturing.

Way forward: Post completion of the DPR for the proposed TC at Baddi under TCSP, the on-boarding of 3 main partners would be very much required to achieve the envisaged outcome in the defined time frame.

- Construction Management Consultant - For the development of the new facility
- Technology Partner – Procurement of machines and adoption of new technologies
- Cluster Network Manager – Marketing the centre an development of cluster with the right mix of products and services

Location/Cluster/ Industry Selection

3. Framework for Selection of Industry/ Clusters/ Systems/ Location for New TCs

3.1. Location selection framework

With the objective of establishing 15 new TC's to support industry clusters, there was a need to prioritize and identify high potential growth industries based upon certain selected parameters. Hence, one of the most challenging and critical aspect of the TCSP was selection of the Industry/Clusters/Systems/Locations. This required careful consideration of parameters and consultation with the stakeholders. Preliminary meetings with the O/o DC-MSME were held to discuss the concept and approach. Subsequently three distinct approaches were finalised to identify the locations:

a) Manufacturing Competitiveness approach: Key idea for this approach was to identify location for TC at a place where it can create the most impact on improving the manufacturing competitiveness. The steps involved were:

- Listing major manufacturing industries creating value across country
- Identifying the clusters which can be catalyst to the manufacturing competitiveness for respective industry

One key limitation of this approach is that it will select the clusters which are already established and are among the most competitive across the country. A TC at such location will further improve the competitiveness of this location.

b) Inclusive Growth approach: Approach is based on the assumption that the state which has higher Net State Domestic Product has significant growth and hence the states with lower per capita state domestic product should be supported. A TC in such states would become a catalyst to improve the manufacturing growth in the state. Following steps were followed:
   - Identification of bottom 15 Low Income states on the basis of per capita Net State Domestic Product[9]
   - Identification of major manufacturing Industries in the selected states
   - Identification of the major clusters for the identified major industries in the state

One of the key drawbacks of this approach is that clusters identified will not be the most competitive for the industry in the country. It is possible that by investing in a TC at such a location might improve the competitiveness of that cluster but this may not lead a world class centre TC.

c) Alignment of Major Economic Projects: Since a TC will create value for many years[10] and there are some mega projects in progress which will be completed in the next 10-15 years. This

[9] 2011-12 Current prices

approach aims to incorporate the possible future growth areas on the basis of these mega projects. Considering that such economic growth is based on future development, these areas may not get covered in the above two approaches. The steps included are:

- Identification of major Economic projects & timelines (which have been ratified by the Government)
- Listing the States & Industries that are getting impacted
- Identifying the emerging clusters for the top industries

Above three approaches resulted in the first list of locations. It was important to create a common framework to choose the most appropriate location. In this context "systems approach" was applied. Systems approach takes in to account the presence of entire ecosystem for a TC in the catchment area[11] and a Location Attractiveness (LA) Index was created.

A Technology Centre will perform better in achieving its objectives if it is established at a location with better LA Index.

Construct of LA Index:

LA Index Score= Catchment Score * Presence of TC Score

Catchment Score = f x (MSME Unit Score * ITI/PT Score * Presence of Major Firms Score* Presence of Leading Technical Institute Score)

Presence of TC Score= Presence of state/private technology center in the catchment area

Following data prints were captured and analysed:

- Number of MSMEs, Number of ITIs /Polytechnics, Number of Major Firms, Leading Technology Institutes for R&D
- Existence of TCs in the Catchment area (inclusive of DC-MSME, State Government , and Private Tool Rooms)

MSME Units: This reflects the concentration of MSME and it is envisaged that larger the number of units more opportunity for TC to impact the competitiveness.

Number of ITIs/Polytechnics: This reflects the availability of population seeking skill development courses. It has also been observed that students from ITI and polytechnic form a large group of students seeking vocational training at TCs due to lack of such facilities at their respective institutes.

[10] Existing Technology Centers are more than 25 year old.
[11]Catchment Area = District of the location and all neighbouring districts (transcending state boundaries) it is assumed that maximum value creation will be in the immediate surroundings of the Technology Center.

Number of Major Firms: It has been observed that often larger firms take the initiatives to go for technology upgrades and performance improvements. This leads to cascading effect and firm's suppliers, competitors follow up these initiatives in order to stay competitive. If a TC has larger number of such major firms in the vicinity it will have more opportunity to do technology collaborations and thus impact the entire ecosystem.

Leading Technology Institutes: Each TC can play a vital role to establish an Industry- Academia partnership. It has been found that while there are researched ideas available at the academia but they have difficulty in commercializing same. On the other hand the industries are looking for the fresh ideas to improve upon their competitiveness in the market. Unfortunately this linkage does not happen as industry has the need for ideas where the proof of concept is ready but unfortunately academia does not go beyond research. TC can play a role of bridging this gap and create the platform to link industry and academia.

State/Private TC: TC can play a vital role in mentoring and improving the performance of the state government or private sector TCs (tool rooms). If there are such opportunities in the vicinity of the MoMSME TC it can further increase the reach of TC to improve the competitiveness of MSMEs.

The weightages assigned to each parameter were as below:

				Catchment Area Parameters				Major Firms		Tech Inst.		Presence of state/pvt TR	
		100		30		20		20		10		20	
State	Industry	Location	Net Score	Units	Unit Score	ITI/PT	ITI/PT Score	Number	Score	Number	Score	TC of State Govt/ Pvt Tool Room	TC-State Govt/ Pvt Score

In order to further refine the list of locations arrived using the above approach, following additional criteria for shortlisting the industries were incorporated:

- Prior experience: These are the sectors where O/o DC-MSME has experience of operating TCs, such as General Engineering, Automotive, Electronics/ESDM, Leather & Footwear, Glassware, Sports Goods, and Fragrance & Flavours
- Concentration of MSME's: These are sectors where O/o DC-MSME has limited prior experience of operating TCs, however there exist a large number of MSMEs in these

industries. Such as Food processing, Textiles (including Handlooms & Handicrafts), Pharmaceuticals, Wood/Paper/Pulp, and Rubber & Plastics.

- Emerging Sectors: These are upcoming sectors that may be at the forming stage, but will become major sectors in the near future, such as Bio-technology, Nano -technology, etc.

The sector in which DC-MSME has prior experience has been taken on priority. These sectors are: auto components, ESDM, general engineering, fragrance & flavour, leather & footwear, glass. Later the scope can be expanded to include other sectors pertaining to ministries other than MoMSME, if needed. Such sectors include food processing, pharmaceutical, packaging etc. where presence of MSMEs is considerable.

The list of locations arrived by the above was further refined and finalised with respect to the following additional considerations;
During these discussions additional considerations emerged:

- State Classification: The states were classified into two categories as unserved states and served states. All states of the country were distributed between Un-served states where O/o DC-MSME did not have an operating TC and served states where an operating MoMSME TC existed.
- At first unserved states were considered for the new TC in order to spread the coverage of MoMSME TC which would help in supporting more MSMEs across the country. With the approval of locations for the unserved states, served states would also be considered for the technologies for which existing TC cannot support.
- On the basis of MSMEs concentration in prior experience sectors, leading clusters were identified in each unserved state. This resulted in identifying the industry wise potential locations in each of these states.
- Some of the unserved states took proactive approach and have allocated or identified land for the purpose of TC. These locations were mapped to the locations identified in the step above. Accordingly technology focus was selected for these locations.

3.2. Selection of Baddi location for setting up of new TC

As per the location selection framework and subsequent approval in the 4th PSC meeting held on 15th May 14, Baddi was selected as the location for setting up of new General Engineering TC focus. Baddi region has been found suitable from multiple perspectives:

- Baddi is an industrial town and a Nagar panchayat in the South-western Solan district of Himachal Pradesh, a hill state of northern India. Himachal Pradesh is an unserved state where there is no existing TC.
- Baddi is one of the fastest growing towns in Himachal Pradesh and it has become a manufacturing hub for Indian and Multinational Companies In the recent past.
- Baddi region has a presence of diverse sectors such as automobiles, Pharmaceuticals, IT electronics and other engineering sector.
- Baddi is emerging as the pharmaceutical industry capital of India. More than half of India's pharmaceutical production, mainly formulations, would originate from Himachal Pradesh as 200 more odd medium and large-scale units has been setting up their manufacturing units in and around Baddi..
- Himachal Pradesh has a large deposit of mineral as per investigation of Geological Survey of India; the minerals available in Himachal Pradesh include limestone, pyrites, clays, salt, gypsum, slate.

Location Brief

4. Location brief

4.1. Regional overview

Baddi is an industrial town and a Nagar Panchayat in the South western Solan district of Himachal Pradesh. Baddi is located at 30.94°N 76.77°E. The town lies on the border of Himachal Pradesh, Punjab and Haryana states in the Shivalik Hills, around 35 kilometres west of Solan. Nearby city Chandigarh, a union territory is around 40 km -South of Baddi.

Baddi has been identified as a regional centre or priority town of the National capital region due to its strategic location and incentives offered by the local government to industries. Additionally, Baddi is one of the fastest growing towns in Himachal Pradesh. Over the last few years, Baddi has become a manufacturing hub for Indian and Multinational Companies and has transformed into an industrial centre of Himachal Pradesh. The industrial corridor stretching from Barotiwala to Nalagarh along the western border of Solan district supports the industrial scenario in Baddi.

Figure 3: Location of Baddi

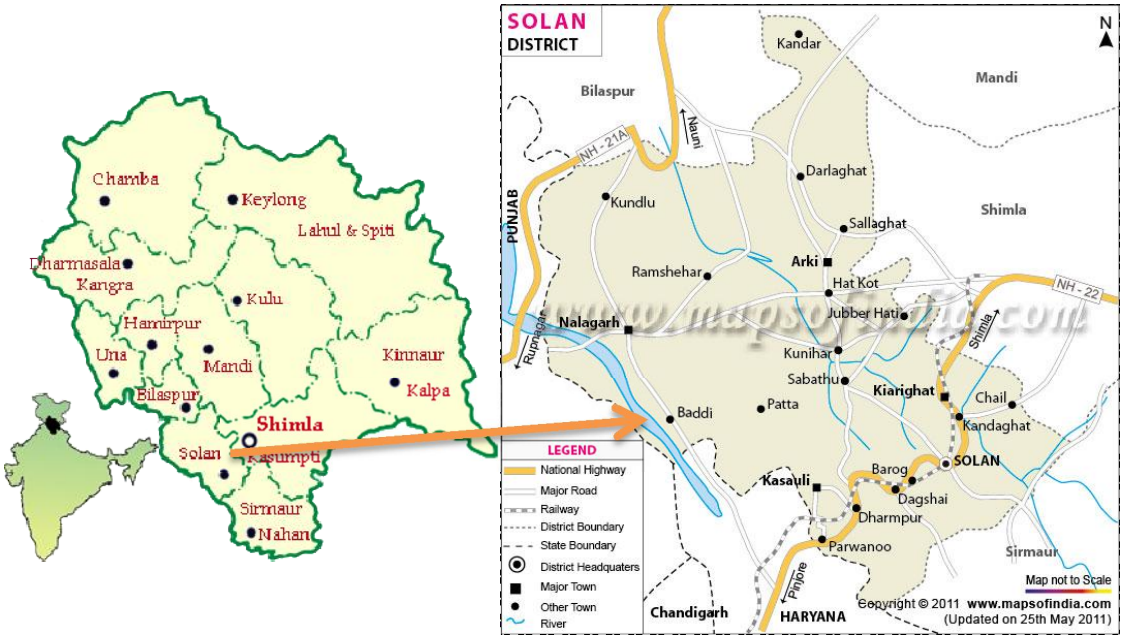


Table 3: Solan District Snapshot

Section	Quantity/Value[12]
Area	
Total geographical area	1,936 Sq. km
Administration	
Tehsil	5
Villages	2388
Land use pattern	
Total area	1,80,923 Hectares
Total irrigated area	56,006 Hectares
Population (census 2011)	
Total population	5,76,670
Men	3,11,377
Women	2,65,293
Literacy (except 0-6)	
Total literate	83.68 %
Men	89.56 %
Women	76.97 %
Infant mortality rate	60 per 1,000 live births less than one year

[12] Solan Industrial Profile

Table 4: Status of power, water, wind and rainfall[1]

Aspects	Status	Significance for TC
Water availability	► Baddi Barotiwala Nalagarh Development Authority intended to facilitate the industrial areas with water supply ► Ground water is the only water source for domestic, agricultural and industrial use ► Ground water level in Baddi show positive trends with water level rising on an average by 0.11 cm/per year over the last 20 years[13] ► The ground water quality meets the standards as specified under IS: 10500.	► Ensures availability of water on a daily basis. TC may also dig a bore well. This would require permission from Central Ground Water Board ► The same would be permitted on the condition of provisioning of a rain water harvesting system of double the capacity of consumption of ground water
Electricity availability	► Power is being distributed by Himachal Pradesh Electricity Board Ltd. ► 100% of villages in the state are electrified with all of the villages are metered. ► Electricity availability in Baddi during 3 hours in the evening at a tariff of Rs. 4.40/hour ► 95% of households in the state have electricity 24/7	► Power back up to be designed keeping emergency and essential services/equipment's in mind
Wind flow	► Typically the wind velocity is about 4.8 km per hour[14] ► Relative Humidity: Forenoon: 69% Afternoon: 49% ► The height above the level of sea is around 392 meters in Baddi region ► Wind direction: Winds are strongest (7.4 km/hr) in May and lightest (3.2 km/hr) in September. The predominant wind directions are E, NE, NW, SE.	► Would be helpful to maximise natural ventilation during designing the layout of TC
Rainfall	► The average annual rainfall measured in the region is about 1186 mm	► For estimation of capacity of rain water harvesting system in the TC campus

[13] Ground water information booklet-Solan District
[14] Himachal Pradesh district wise information

Temperature	► The temperature in Baddi varies from 7 degree Celsius in winter to 38 degree Celsius in summer season. The average annual temperature in Baddi is 23.4 degree Celsius[15]	► For estimation of capacity of AC to be installed for adequate cooling, designing of building as well as estimate the potential for use of solar based equipment

[15] Climate-Data location Baddi

4.2. Demographic profile of the District

Below are some of the key demographic markers that have been analysed:

- Population Growth: The total population of Solan district is 5.76 lakh (census 2011) of which male and female are 308,754 and 271,566 respectively. The growth of population in Solan district was 15.93 % during the last decade (year 2001–11). The density has increased from 259 people per square kilometres in year 2001 to 300 in year 2011.
- Rural-urban population composition: Out of the total Solan district population, about 18% (~ 1 lakh people) live in urban regions of district of which males constitutes about 58% (~59,000) and females constitutes 42% (43,000). On the other hand 82 % (~4.8 Lakh people) population of Solan districts live in rural areas of villages of which males constitutes 52 % (2.4 lakh) and females constitutes 48% (2.2 lakh).
- Sex Ratio: 880 per 1000 males in Solan district
- Literacy Rate: The literacy rate of Solan district is around 83.68%. Among male and female this rate is 89.56% and 76.97% respectively.

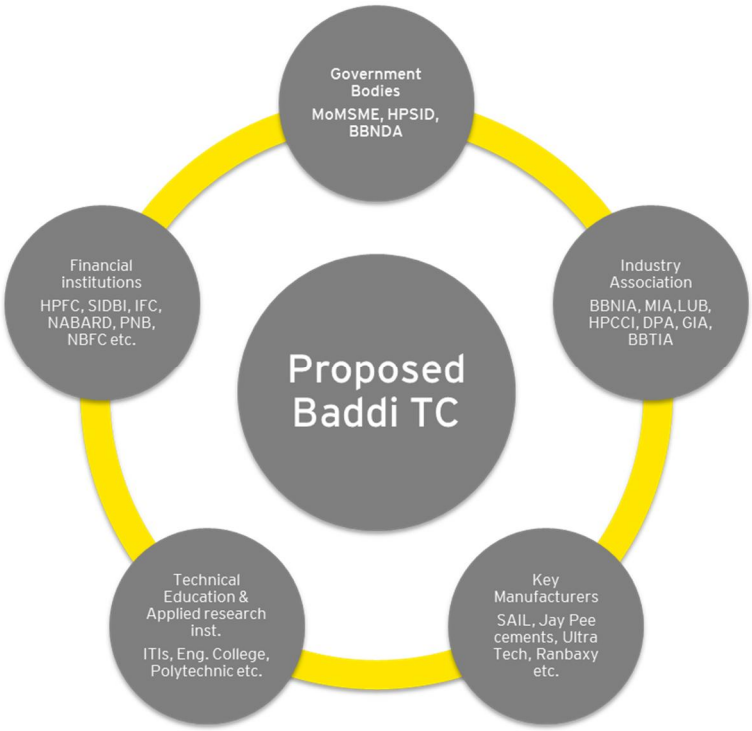
4.3. Regional Stakeholders

Regional Industry associations, leading manufacturers (MSME units and Big Industries), training institutes, applied research institutes, academia would play an important role in providing direction on key aspects including (but not limited to) designing capabilities, technological requirements, skill set requirement and cluster development.

Key stakeholders for Baddi TC would include; Government bodies, Industry body associations, manufacturers and suppliers (Big manufacturing industries and MSMEs etc.), financial institutions, technical and vocational training institutes, applied research institutes etc. in the catchment area.

The following figure depicts the stakeholders of the Baddi TC;

Figure 4: Stakeholders of Proposed Baddi TC



4.3.1. Technical education institutions and vocational training

The details of technical and vocational training institutes supplying skilled man-power in the catchment have been displayed as follows;

Technical Education Institutes:

- More than 45 thousand (year 2011-12) students enrolled in approximately 264 technical institutions in the State
- In 2013 approximately 103,297 candidates appeared in the state for the 12th examination with the total pass percentage of 65.01% (67151 passes)

Some of the key institutes are

- Indian Institute of Technology, Mandi
- Jay Pee Institute of Information & Technology, Solan
- National Institute of Technology, Hamirpur
- Jawhar Lal Nehru Engineering College, Sundernagar
- National Institute of Fashion Technology, Kangra

In addition, several institutions are currently setting up campuses in the state like:

- Hydro Engineering College to be established at Bandla in district Bilaspur in collaboration with NTPC.
- Five new government Polytechnics will be established in the districts of Sirmour, Bilaspur, Kullu, Kinnaur and Lahul & Spiti. This initiative will result in 360 additional seats. 185 posts have been sanctioned for these polytechnics.
- Indian Institute of Management (IIM) for Himachal Pradesh, which has been proposed in the Union Budget 2014, will be set up in the district of Sirmaur.

The Directorate of Technical Education in Union Territory of Chandigarh has four technical institutes under its control

- Central Polytechnic (CPC)
- Government Polytechnic for women (GPW)
- Industrial Training Institute (ITI)
- Government Central Crafts Institute for Women (GCCIW)

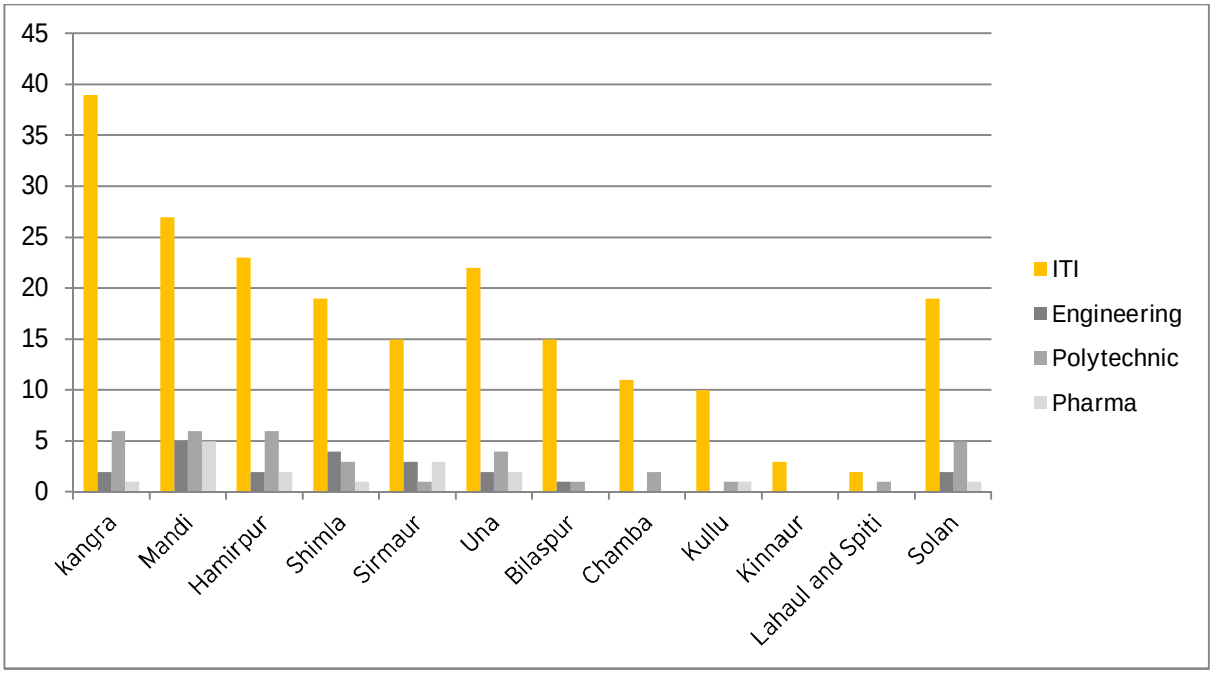
These institutes cater to the Supervisory and skilled manpower needs of the industry in Baddi in many trades like Carpenter, Electrician, Plumber, Fitter, Welder, Instrument Mechanic, Machinist-Grinder, Tool and Die Maker, Turner, Electronics Mechanic, Mechanic -- Refrigeration and Air Conditioning, Draughtsman (Civil & Mechanical) etc.

Table 5: Intake Capacity at Technical Institutions in Himachal Pradesh

Type of Institution	No. of Institution(Govt. + Private)	Annual Intake Capacity(2011-12)
ITI	83+118	16499+12697
Engineering	3+17	240+6360
Pharma	1+13	40+960
Polytechnic	10+19	1490+6510
Total	264	44796

Source: Reports of Directorate of Technical Education, Himachal Pradesh

Figure 5: District Wise Number of ITIs, Engineering, Polytechnic and Pharma Institutions in Himachal Pradesh



Source: http://techeduhp.gov.in/Reports/

Solan has a high number of ITIs, which means that there is quality supply of graduates that will enter the workforce every year. This should contribute to the growth of the MSME sector in the state.

Below are the quantifiable numbers of technical institutes with close proximity to Solan district:

Table 6: Intake Capacity of Technical Institution in Chandigarh and Ludhiana

Type of Institution	Chandigarh	Ludhiana
ITI	2	2
Polytechnic	3	11
Engineering	9	8
Total	14	21

Source: Reports of Directorate of Technical Education, Himachal Pradesh

Chandigarh and Ludhiana are the two nearby areas to Himachal Pradesh that provide a huge amount of quality skilled labour for industries and many industries from Baddi, Solan , Kangra also used to recruit from theses technical institutions. These ITIs offer training in many trades like Carpenter, Electrician, Plumber, Fitter, Welder, Instrument Mechanic, Machinist-Grinder, Tool and Die Maker, Turner, Electronics Mechanic, Mechanic (Refrigeration and Air Conditioning), Draughtsman (Civil & Mechanical) etc.

Vocational Training

Vocational Training Providers under the Skill Development Initiative Scheme(SDIS) based on Modular Employable Skills training provide vocational training to school leavers, existing workers, ITI graduates, etc. to improve their employability by optimally utilizing the infrastructure available in Government, private institutions and the industry and to build capacity in the area of development of competency standards, course curricula, learning material and assessment standards in the country.

There are 86 Vocational Training Providers(VTP) registered with the Directorate General of Employment & Training for implementing Modular Employable skills (MES) under skill Development Initiative Scheme of Government of India.
Out of these 58 VTPs are Government industrial Training Institute, 28 VTPs are in the private sector.[1]

The duration of these training courses varies from 15 days (90 hours) to more than 45 days (270 hours) and the minimum qualification requirement to avail for these trainings is between 5th pass and 12th pass depending on the course.

Solan shows strength in government ITIs, with the 3rd highest number of government ITIs in the district. There is scope for these institutes to collaborate with the prospective TC to train the trainers.

4.3.2. Government Bodies

- Himachal Pradesh State Industrial Development Corporation Ltd. (HPSID): The Himachal Pradesh State Industrial Development Corporation Limited (HPSIDC) is the major agency for promotion and establishment of industrial units is Himachal Pradesh. Registered under the Companies Act 1956 HPSIDC is fully owned by the Government of Himachal Pradesh. HPSIDC is also the major State level Financial Institution and provides long term loans for industrial projects.

  The key function and duties of the HPSIDC are
  - Providing term loan assistance up to Rs.500 lakh to industrial ventures.
  - Undertaking sale of sick industrial units on attractive terms.
  - Providing guidance/information regarding policies & procedures of Government on
  - Setting up of industries
  - Providing “Escort services” of varied nature to entrepreneurs for such matters as
    - Securing registrations/clearances etc. from statutory authorities
    - Developing industrial infrastructure and undertaking all kinds of civil/ construction works.

- Baddi Barotiwala Nalagarh Development Authority (BBNDA): BBNDA has been constituted on 30th November 2006 under the Himachal Pradesh town and country planning act 1977 as a special area development authority for planned and regulated development of Baddi, Barotiwala and Nalagarh industrial area. Baddi, Barotiwala, Nalagarh (BBN) area is a fast and upcoming industrial township which has emerged as a major industrial hub in Himachal Pradesh. Located at a distance of 45 km from Chandigarh on the foothills of Kasauli hills, the BBN area has large tracts of plain land suitable for industrial activity spread over 318 square km.

  The main aim of the authority is to develop BBN area on modern lines into an integrated industrial township and to develop new sectors for various needs of an industrial area. The authority promotes Public Private Partnership (PPP) in infrastructure development and delivery.

In order to give a common platform to exporters, a Trade Centre is being set up in Baddi with an estimated Project cost of Rs.10.81 Crore.

4.3.3. Industry Association

- Baddi Barotiwala Nalagarh Industries Association: BBN Industries Association was formed in 1995 to form an Industries Association for the Baddi, Barotiwala and Nalagarh (BBN) areas of Solan district. The association is now witnessing a spurt of industrial activity, where apart from almost all the known pharmaceutical companies in the country, it has renowned industrial houses, such as Colgate, Cadbury, Gillette, Titan, Vardhman, Havells etc.

The Association was formed

- To promote industries in Baddi, Barotiwala and Nalagarh Industrial Areas of Himachal Pradesh State and to take up the issues of mutual interest of the industries with various authorities.
- To Share knowledge on technical skills, Skill Development & up gradation and to provide training to workers and employees of industries and holding Job Fairs for employment of unemployed youth in Himachal Pradesh.

- Mehatpur Industrial Association: Mehatpur Industrial Area was developed in the early seventies under the Trade Union Act as a most suitable area in Himachal due to its location and nearness to Punjab Markets. The need for forming an association of entrepreneurs was felt in early eighties to address the common problem of entrepreneurs be these relating to construction work, installation of machinery, financial problems or the policy matters related with the state and central government. Mehatpur Industries Association was registered under

the Trade Union Act. Spread over an area of 109 acres there are 142 industrial plots in the area. The industrial area has its own water supply arrangement, sewerage, street light and a community centre in the form of Service Building of the government. The industrial area is maintained by IADA (Industrial Area Development Agency) a body of Government officials and industry partners.

Infrastructure development of the industrial area and General problems of the industry are the two main focussing areas of the association.

- Laghu Udyog Bharati

  It is one of the India's largest Business Network with thousands of registered members coming from all regions working towards the welfare of MSMEs in India. Laghu Udyog Bharati has three chapters in Himachal Pradesh Laghu Udyog Bharati, Himachal Pradesh, Laghu Udyog Bharati, Doon Chapter, Laghu Udyog Bharati Sirmour(Kala Amb Chapter).

- Himachal Pradesh Chamber of Commerce & Industries (HPCCI)

  HPCCI is an apex body of industry, trade and commerce & service sectors, banks & individual professionals of the state. HPCCI works pertaining to development of trade and industry, promoting of government industry inter linkages and pursuing of economic policies etc

  Key activities are:

  - Organisation of awareness programmes, seminars & workshops relating to various aspects of industries.
  - Facilitation to solve problems of industries

- Chamber of Industrial & Commercial Undertaking (CICU): CICU was registered in 1968 as a non-profit making society under the Indian Trade Union Act- 1926 and Registration of Society Act-I. It anticipates changes in economic development identify emerging challenges and evolve action-solutions for the growth & development of MSME Sector. The Chamber also works towards developing market access for Punjab exporters, identifying and addressing the needs of MSME sector to make them more competitive.

  Key Activities of the Chamber includes

  - Organizing Interactive discussion/seminar/training program on important issues relating to export promotion, power shortages, transport bottlenecks and State/Central Government Taxation policies.
  - Interaction with delegations from foreign countries on doing business and organizing exhibition and trade fairs.

- Ludhiana Hand Tool Association: It was started in 1990 to provide various facilities in manufacturing for helping the local tooling industries to compete against the Global giants. It represents almost 100 SSI units and supports the cluster units to improve efficiency as well as works to encourage and strengthen its cluster units. Ludhiana Hand Tools has highest production capacity in India, which is more than 55% of the total Indian Hand Tools Production.

  The main objectives of opening the Association was

  - To provide technical consultancy to industrial units on product development, tooling, design and manufacturing processes.
  - To provide common facility services for the manufacture of tools, jigs, fixtures, forging.
  - To provide raw material testing centre and training centres for entrepreneurs.

- Industries Association of Chandigarh (IAC): IAC is the leading industry association formed in 1962 to create and sustain an environment conducive to the growth of industry in Chandigarh partnering with the government through an advisory and consultative process. This association brings more than 200 entrepreneurs owning micro, small and medium industrial units as its Members. The Association has played a vital role in the development and growth of MSME units in the city. The association provides a platform for making entrepreneurs more innovative and efficient to gain a competitive edge

- PHD Chamber of Commerce and Industry (PHDCCI): PHDCCI is the apex chamber of Northern India established in 1905. The Chamber acts as a catalyst in the promotion of industry, trade and entrepreneurship. The chamber services all eight states of northern India (Punjab, Haryana, Delhi, Uttar Pradesh, Himachal Pradesh, Rajasthan, Jammu& Kashmir, Madhya Pradesh and the union territory of Chandigarh).

  PHDCCI has a member ship of more than 1600 Large, medium and small scale sector units in Chemicals, engineering, light engineering, textile etc.

  Key Activities:

  - Organize meetings with visiting foreign trade delegations and participation of members in important trade fairs in India and abroad.
  - The chamber has set up a PHD Institute of Business Development to promote study and research relating to business development in general and recommend strategies for growth and development of small and medium enterprises.

- Mohali Industries Association, PHD Chamber of commerce and Industry, Drug & Pharma Association, Industries Association Kala Amb, Haroli Block Industries, Gagret Industries Association, BBT Industries Association are some the other industrial association in the nearby region from which the proposed TC can take suggestion and feedback on the various problems faced by them in current Machines , Technologies and skilled labour availability

4.4. Leading manufacturers

- Large Players

The Baddi and its nearby region house some of the largest industries in the Engineering, Steel, Cement and Pharmaceuticals sector. The big players in these sectors are TVS Motors, Blue star, Gabriel, Steel Authority India Limited, Met Trade Ltd., Jay Pee Himachal Cements, Ambuja cements, ACC Ltd., Ultra Tech Cements, Ranbaxy Laboratories, Cipla, Dr. Reddy's Laboratories, Mankind Pharmaceuticals etc. The proposed Baddi TC would develop capabilities in manufacturing of tools and repair workshops required to support these enterprises. It would also play an important role in the supply of skilled manpower and consultancy regarding the maintenance of the machines.

- MSMEs

The state has MSME presence primarily in Solan, Kangra, Una, Bilaspur, Hamirpur, Mandi, Shimla and Sirmour. Solan and the other nearby districts Kangra, Una, Bilaspur in its catchment area together give house to more than 2500 MSME units in manufacturing across key focus sector(General Engineering, Metals and Minerals based sector). These districts account for around 50 percent of the total MSMEs in term of investments and total number of MSMEs in the state. An overview of the spread of MSMEs in this region has been provided in the need assessment section.

4.5. Raw material Suppliers

Raw Material	Major Supplier/brands
Mild Steel	SAIL, Tata Steel, Jindal Steel

Tool and Die Steel	ASSAB Sripad Steels, Buderus Edelstahl, Bohler Uddeholm
Copper &Copper Wires	Nikunj Eximp Enterprises, Birla Copper
Others	Sandwik Asia, Birla Kena Metal, L&T

4.6. Financial Institutions

- Himachal Pradesh Financial Corporation (Shimla)
- Lead Bank : PNB, SBI, UCO
- National Bak of Agriculture and Rural Development(NABARD)(Shimla)
- Small Industrial Development Bank of India(Shimla)
- Non-Banking Financial Corporation
- Industrial Finance Corporation of India

Opportunity and Need Assessment

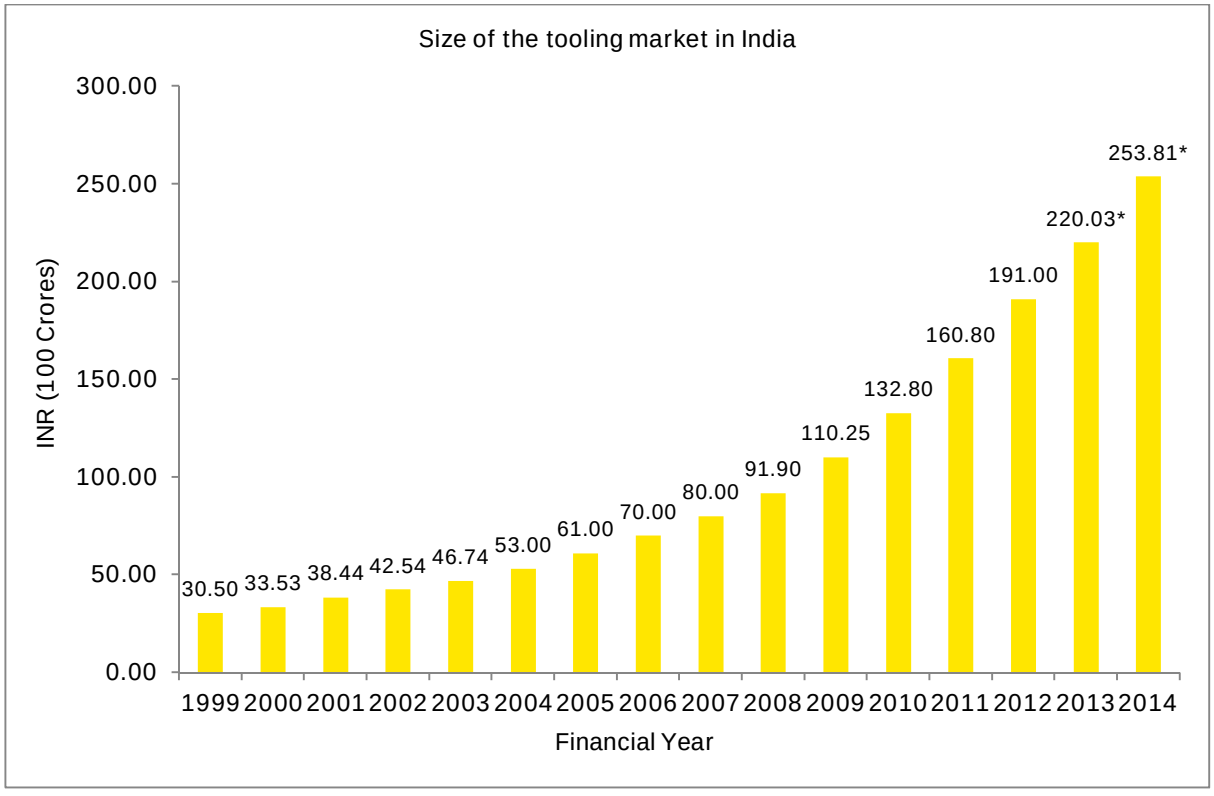
5. Opportunity and need assessment

5.1. Overall Market size

The tooling industry, that consists of developing and manufacturing dies, moulds, casts, as well as testing and prototyping serves as the interface between product design and product manufacturing. Growth of these manufacturing related industries, therefore, drives the growth in demand for tooling. The constraints to the growth and competitiveness of the Indian tooling industry mirror the ones affecting manufacturing as a whole. The scarcity of skilled workers and problems related to their retention, as well as the lack of access to a high-quality design and prototyping facility, has hurt growth.

The trend of growing demand for tooling market is illustrated in the figure below (source: TAGMA):

Figure 6: Size of the tooling market in India



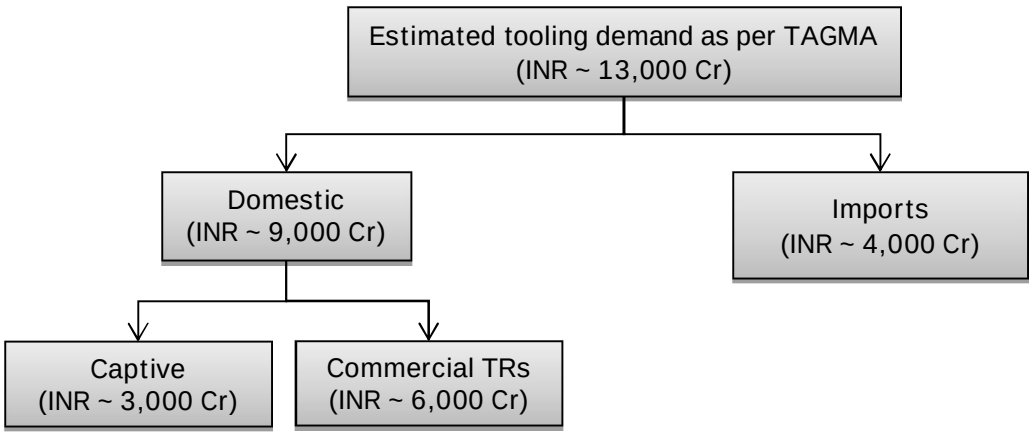
*Projections based on CAGR of 15.2%

Indian Tool Room industry size is estimated at ~INR 13,000 Cr. (2010-11)[16] which can be divided into two key segments - domestic (captive and commercial) and imports. Domestic Tool Rooms market is estimated at INR 9,284 Cr out of which INR 3,129 crores is generated from captive tool rooms and commercial tool rooms (CTRs) account for INR 5,955 crores. Imports are to the tune of

[16] Indian tool room industry report, TAGMA (2011)

INR 4,150 Cr. In order to arrive at the addressable market for MSME TCs, a further analysis of the above three segments has been carried out.

Figure 7: Structure of tooling market



In-house (Captive) Tool Rooms: Captive Tool Rooms mainly belong to the large and medium scale companies that develop tools for in house requirement, e.g. auto component, plastic, packaging etc. Such Tool Rooms have state of the art equipment to meet the internal requirements. Auto components and OEMs constitute around ~70% of this segment. Quality tooling is critical to produce high quality finished components and such companies perceive that quality of the components can be maintained only by developing tools in house or through imports from their foreign counterparts which also ensures steady supply as per requirement. Another major reason for captive tool making is that these companies don't want to share their designs of tools to safeguard intellectual property of the company. Nearly ~ 70% of auto and auto component companies except from Indian manufacturers, primarily import their tooling or have a captive Tool Room mainly due to lack of raw material quality and IP content. Indian Commercial Tool Rooms suffer from capacity constraint causing an increase in the lead time for manufacturing the tools to meet the demand of the end users. Thus, captive segment does not present a

Figure 8: Composition of captive segment

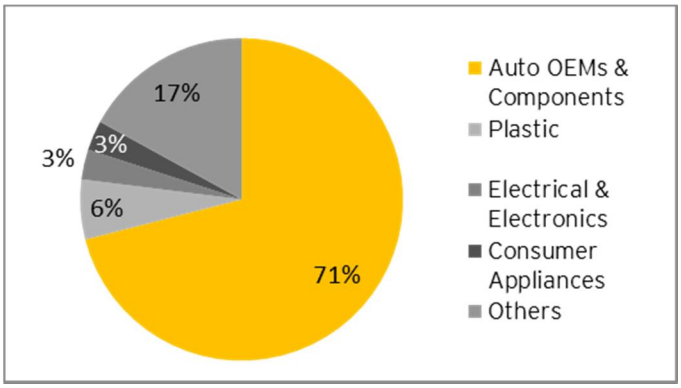
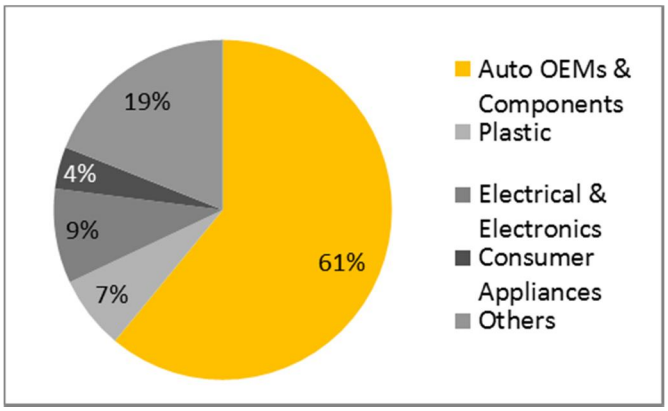


Figure 9: Composition of CTPs segment

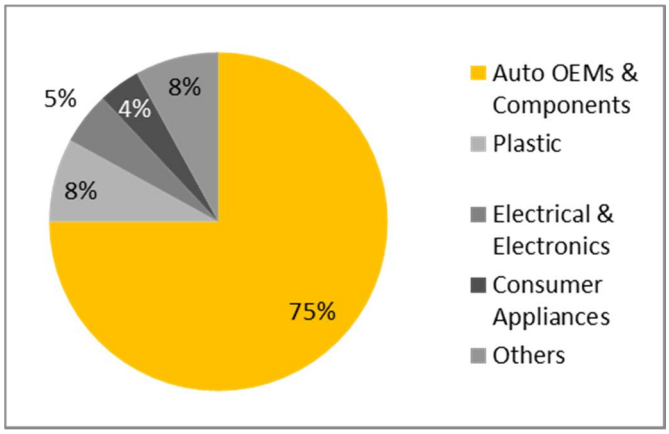


significant opportunity that can be targeted by MSME tool rooms.

Commercial Tool Rooms (CTRs): Commercial Tool Rooms account for ~ 46% of the total tooling market. Commercial Tool Rooms supply tooling on a commercial basis to a variety of industries and operate as independent companies. Besides manufacturing tooling, some Commercial Tool Rooms also undertake precision machining and component manufacturing. This segment with an estimated market size of the ~6,000 crores (in year 2011) is the immediate low hanging fruit which can be addressed by MSME TCs by supporting Commercial Tool Rooms. It has been observed that Commercial Tool Rooms have insufficient capacity that leads to an increase in lead time for manufacturing of tools.

Imports: Imports account for ~ 31% of the total tooling market which is around INR 4,000 crores. As per TAGMA report and our discussions with some of the Private Tool Rooms, key reasons for tooling imports are;

Figure 10: Composition of imports segment



- Quality: Better surface finish, lower turnaround time and higher degree of accuracy by ability to meet the tolerance range.
- Capacity: Insufficient capacity of Indian tool rooms to meet domestic demand and lack of infrastructure to make certain types of tools also results into imports.
- Cost: Higher price, non-availability of materials at par with the international standards, use of out dated technology due to absence of advance machinery compromises the quality of commercial tool rooms leading to demand for imports. In Countries like China and Taiwan, the tooling cost is lower than India.
- Design: International companies based in India prefer procurement of their tooling from their parent company to maintain design standards across the globe e.g. LG & Samsung import most of their tooling from Korea.

Auto OEMs and components segment account for around 75% of the total imports in tooling. International companies like Volkswagen, General Motors and Siemens etc. still prefer international tool makers for superior quality. The rest 25 % i.e. accounts for tooling requirements from other sectors which can be addressed by MSME Tool Rooms. This pushes the customers to look outward to fulfil their requirements.

Total addressable market for MSME Tool Rooms is about INR 7,000 crores (6,000 for Commercial Tool Rooms + 1,000 crores imports, especially those imports which take place as a result of insufficient capacity of domestic Commercial Tool Rooms.

To start with, the primary focus could be addressing the capacity constraint in the domestic tool room industry in the short run. However, a focused approach towards specialised tool production in the long run can help capture a part of imports which is being replaced by domestic supply from Commercial Tool Rooms. This would require additional support to Tool rooms just more than financial support and assistance. In the long run – MSME TCs can address rest of the market by,

- Increase in specialisation,
- Process standardisation,
- Safeguards to protect IP,
- Sharpen focus on quality and reduction in lead times

5.1.1. Primary Research

As a part of preparing the DPR, we had discussions with some auto component manufacturers and suppliers in the Bhiwadi region (such as Manesar, Faridabad, Gurgaon, Delhi, Noida). The objective of the primary research was to understand their business requirements, issues, challenges, and future requirements to develop a deeper appreciation of the requirements that the Technology Centre Systems Program of the O/o DC MSME can serve in the future. The research also included the support requirements of these players' w.r.t designing, training, manufacturing and consultancy.

Detailed telephonic discussions as per the questionnaire were conducted with 22 players[17] to understand their needs and potential areas of support. 60% of the companies had turnover of up to INR60 crores and rest 40% had turnover of more than INR 100crores.

Key inferences drawn from the primary research are as follows:

- The main items produced were die cast products including use of moulds. Other important products include sheet metal products, rubber products and plastic parts.
- The main manufacturing processes in use were moulding, welding, die casting, forging, hydraulic pressing processes, CNC (Computer Numerical Control) such as VMC. There weren't many issues in the current processes
- 55% of the companies have in-house facilities of production of tools,
- 60% of these companies procure tools from domestic suppliers and rest 40% import tools.

[17] Details provided in the Annexure

- Approximately 25% of the companies face problems in tool quality and availability, high cost of tools. Industries such as RICO Auto Industries, SKH Auto components, Bony Polymers, Machine Polymers highlighted the same.
- Only 10% of the companies have seeked the support of MSME tool rooms previously (such as SKH auto components)
- Approximately 65% of the auto component suppliers are ready to accept the support of MSME tool rooms/ TC's w.r.t. tool designing, manufacturing and training.
- There is scope for MSME's in making moulds, dies and sheet metal tools.
- The main managerial manpower requirements of these companies are engineering (B. Tech engineering/ diploma engineering and tooling engineering) with project management skills and manpower handling. The machine operators are generally ITI graduates in the respective field of manufacturing.
- Approximately 20% of the companies face human resource problems w.r.t. project management skills, leadership and motivational skills, manpower management skills, less availability of workforce, disciplinary issues and industrial training.
- Technologies like automatic weighing and carbon paint technology are generally not available.

Further similar kinds of inferences were also observed during telephonic discussion with 19 players[18] across Hyderabad, Karnataka, Chennai, Aurangabad and Ahmedabad w.r.t. support requirements of these players for designing, training, manufacturing and consultancy carried on. There is a need to position the MSME tool rooms to support the commercial tool rooms to strengthen their design capabilities and capacity to manufacture complex tools. Further, there is also a need to create more awareness of new technologies and opportunities among private tool rooms to enable them to serve that market.

Key challenges faced by players:

a. At the industry level

- Absence of or limited automation in the manufacturing process in India;
  - Leads to low machine utilisation of around 50-55% on an average (best in India is around 70-75%) compared to 95-99% abroad in China where a single operator manages 5-6 machines.
  - Main reason is lack of knowledge/ awareness of low cost automation technologies.
- Lack of standardisation
  - Limited or very small number of standardised components for mould design in India cause delay in the production process. For every mould to be developed, designing is done from scratch to finish. In China & Malaysia the standardised component usage is

[18] List of players contacted is attached in the annexure

very high and therefore concentration is more on core & cavity design of the mould resulting in better quality and faster production

- Use of Standardised components helps to deliver moulds in 1 week in China compared to 4 weeks required in India.

- Lack of availability of skilled workers& high attrition/ job hopping, shortage of trained manpower at machine operator level.
- Low capacity and lack of capability to develop heavy and precision machines requiring a high proportion of the CNC machines to be imported (2/3rd of the total CNC machines) mainly because of the capital intensive nature of investment.
- Others
  - Limited/ slow adaptability of technology by domestic TRs duet to perception of quality about domestically developed products
  - Dispersed/ unorganised industry structure.
  - High cost of inputs makes Indian machines costly to users as compared to those imported.

b. Other macroeconomic factors

- High interest rates of borrowing (~14%) which discourage investments by compromising viability.
- Spree of free trade agreements (FTAs) / preferential trade agreements (PTAs) leads to a situation of inverted duty structure for Indian manufacturers. Customs Duty is reduced to zero levels and therefore Imports become more attractive that does not encourage transfer of technology and local manufacturing and / or value addition.
- Export efforts constrained by high cost of maintaining a presence in overseas markets.
- Government tender terms place Indian manufacturers at a disadvantage against imported machine tools.
- Skill erosion in machine tools is a serious constraint; yet, no academic course exists in mechanical engineering or even vocational training as a stream for machine tools at any level.

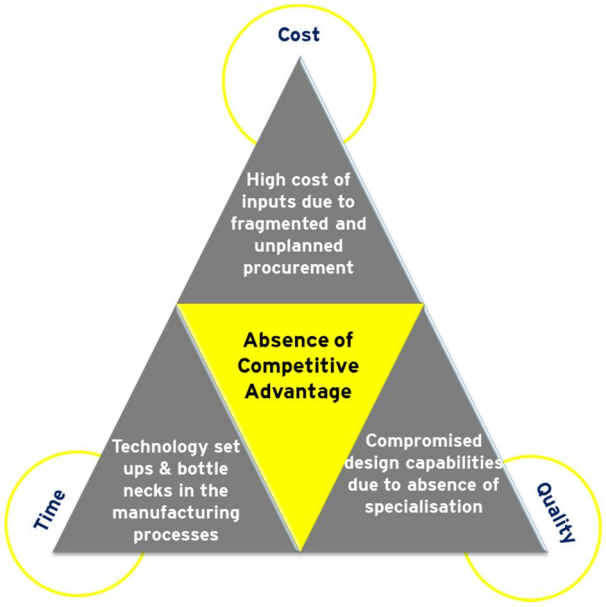
5.1.2. Challenges faced by Indian TCs

An analysis of the existing MSME TRs in India reveals that limited efficiency in production has caused the loss of some clients to private Tool Rooms or cheaper options from other countries. One of the key reasons identified has been the generic nature of tool development by MSME Tool Rooms rather than catering to a specialised category.

Generalised Tool Rooms are the norm in India due to;

- high capital investment requirement,
- to cater to a larger market,
- low volumes in specific categories,
- better risk management and
- absence of specialisation

Figure 11: Absence of competitive advantage



Whereas these Tool Rooms produce a variety of tools, they lack competitive advantage in any of the categories due to lower efficiencies mainly due to the technology used. Time taken for delivery of the product is longer due to;

- technology set ups and bottle necks in the manufacturing processes,
- high cost of inputs due to fragmented and unplanned procurement,
- lower design capabilities due to lack of specialisation

All these factors result in escalated costs and a further loss of competitive advantage. This reflects in the low volumes of tool production orders, which prevents the industry in tapping into the advantages of large scale production and economies of scale.

If MSME Tool Rooms specialise in a particular tool or tool production for a specialized sector, chances of developing competitive advantage become very high. In Germany, a Tool Room of Zitzmann Inc. specialises in particular type of mould development required for manufacturing glass bottles. It has got substantial competitive advantage in the production of such tools. Similarly, in China a Tool Room of China Taoshi Mould has more than 120 machines ranging between 40,000 – 75,000 rpm that specialises in a particular type of moulds whereas for the Indian counterpart the machines range between 12,000 to 20,000 rpm. For instance, on an average, procurement of a certain type of mould from China takes one third of the time it takes to be procured from within India. This is mainly due to low productivity and non-standardised use of tooling components in India.

Specialisation in the production process leads to some degree of standardisation enabling the Tool Room to maintain inventory levels which subsequently reduce the turnaround time for procurement. Another important aspect is the absence of design facilities/ good designers in the MSME Tool Rooms. Non alignment of the compensation structure for designers as per that of the market makes it difficult to retain the designers in the long term.

Case studies – Specialised tool rooms in the world

Zitzmann GmbH & Co.KG, Germany

- Zitzmann glass mould is a large supplier of high quality moulds for the leading glass companies in Germany.
- Specializes in manufacturing of moulds for complex container designs such as;
  - High quality perfume flacons.
  - Medicine bottles, tins, jars.
  - Shaped bottles 3ml – 4250ml.
  - Block moulds, solid blank mould.
- Its production portfolio includes complete mould sets, semi-finished parts, accessories in normal casting, special casting steel or bronze, vacuum full profile coating as well as flame spraying full profile coating.
- It's in house facilities include latest technologies and production methods like;
  - CAD/CAM design using Catia V5.
  - The latest CNC machines in the turning and milling sector.
  - Full profile welded moulds.
  - Induction heat treatment and additional plasma welding.
- It has around 120 highly skilled technicians producing more than 30,000 moulds per year.

China Taoshi Mould, China

- A well-known and one of the biggest plastic mould designing and manufacturing enterprise.
- Manufacturer of moulds, specializing in plastic moulds for automobiles, house electric equipment, electronic products, motorcycle, and other daily-used pieces etc.
- In house facilities include;
  - Large-size CNC equipment including high speed CNC and EDM machines etc.
  - Advanced CAD/CAM/CAE system.
  - Workstation and software of PRO/E, FFCAE, CIMATRON, etc.
- It has more than 600 employees including middle/high administrators and around 180 technicians.

5.2. Market opportunity

Baddi has come to be known as an industrial centre of Himachal Pradesh and is one of the fastest growing towns in the state. Over the past few years, Baddi has surfaced as a major manufacturing hub for Indian and Multinational companies. Attractiveness of the surrounding areas also helps with the growth of the manufacturing sectors. Chandigarh (Panchkula) that has five industrial zones and consists of over 600 MSMEs in the Engineering, Metal and Minerals based units. Some of the large companies that operate around Baddi include Hindustan Machine Tools Ltd., (Machine Tools), Hindustan Machine Tools Ltd., (Tractor Division), Bharat electronics Ltd., Essen Conectors Limited. These large scale industries would improve oppor tunities for MSMEs to grow in this district.

The following factors describe how Baddi provides a conducive environment for MSMEs to grow.

- Baddi has an edge due to its location. The industrial area not only caters to Himachal Pradesh but also the NCR and Chandigarh region. Therefore, industrialists from Delhi, Punjab and Haryana can be encouraged to set up their enterprises here and offers better marketing facilities to the MSMEs in the districts and outside the district

- Hundreds of companies have set up their manufacturing units in and nearby region of Baddi because of tax concessions and financial incentives that are offered by the Himachal Government and Central government. Baddi is emerging as the manufacturing industry capital of the state. TVS Motors, Havells, Loreal, Mahindra & Mahindra, Colgate Palmolive, Procter and Gamble, Hindustan Unilever, Cadburys, Johnson & Johnson, Vardhman, Godrej, Titan Industries, Steelbird, Bajaj, Maharaja and Kapkon are some of the companies setting up their manufacturing facilities in and around Baddi.
- Baddi is situated along the industrial corridor that stretches from Barotiwala to Nalagarh along the western border of solan district making it a strategic location for Industries. Being the biggest industrial belt of Himachal Pradesh, industrial growth for Baddi, Barotiwala and Nalagarh area has been observed at a phenomenal pace

Pharmaceutical industry is the dominant industry in Baddi region. More than half of India's pharmaceutical production, mainly formulations, originates from Himachal Pradesh since more than 300 medium and large-scale units have set up their manufacturing units in and around Baddi.

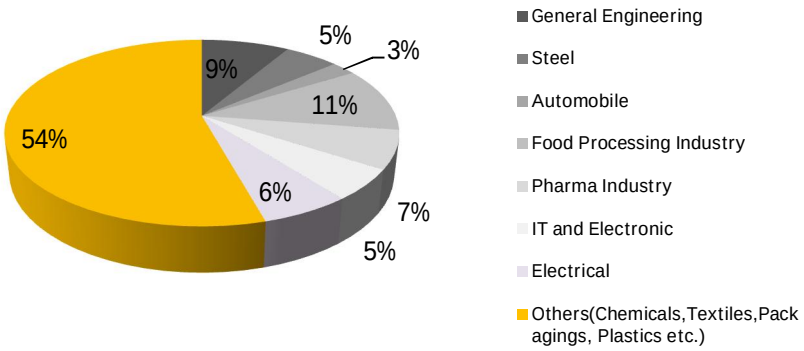
Leading pharma companies like Unichem already operate a beta lactum plant, one Non-betalactum and 1 dedicated Cephlosporin plant in Baddi. Morepan Laboratories has two bulk drug plants in Baddi and 1 plant in Parwanoo. Additionally, the Baddi Nalagarh Belt hosts more than 2500 pharmaceuticals small units, which cater to most of the major pharma players mentioned above.

The Department of Environment, Science & Technology (DEST), Government of Himachal Pradesh, proposes to develop a Biotechnology Park (BTP) spread over an area of about 35 acres at Aduwal in

Solan under PPP mode in the state. The park would have a Biotechnology Incubation Centre as well as a Biotechnology Industrial Cluster. Under the state's Annual Budget 2014-15, the state government planned to allocate US$ 41.9 million for development of Ayurveda-based pharmaceutical industries during FY15.

The diagram showcases an overview breakdown of the industries in terms of operational units in Baddi and the surrounding areas.[19]

Figure 12: Details of Industry in terms of Operational Units



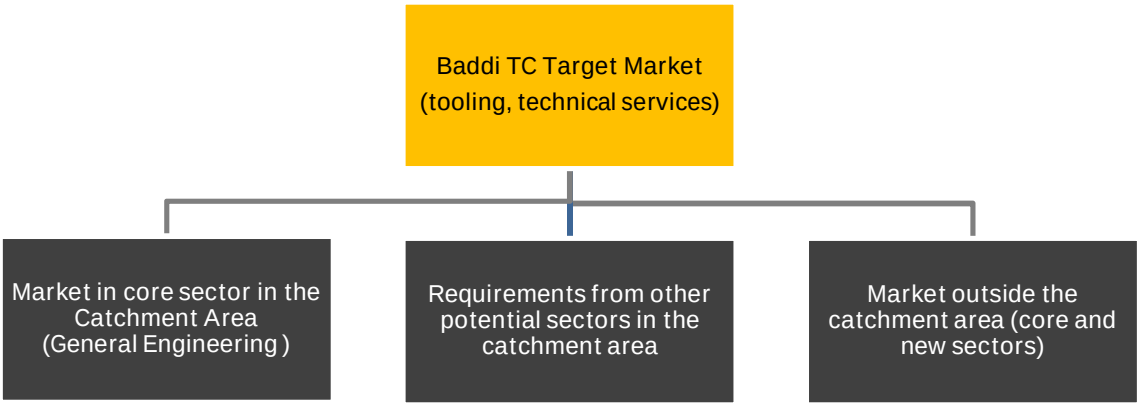
Along with its strategic location, Baddi's competitive advantage lies in:

- Infrastructural development is underway in a big way for industry clusters by Baddi Barotiwala Nalagarh Development Authority (BBNDA)
- Availability of basic amenities such as piped water supply, schools, transportation, hospitals, telecom networks, banks etc.

[19] Department of Industry, Himachal Pradesh, Departmental Statics

- Availability of high quality and abundant power to industrial sector at reasonable rates

Figure 13: Target market structure of Baddi TC



5.2.1. Market in core sectors in the catchment

In the secondary research and market survey, it was found, the industries in and around Baddi are concentrated in general engineering, minerals and metal based sectors. For the benefit of the proposed Technology Centre in Baddi, this report will focus on tooling and training/consulting services in the general engineering sector. The catchment area of the TC is proposed to include the district of Solan and the surrounding districts like Kangra, Una, and Bilaspur.

Key players of major industries present in the Baddi are mentioned in the table below.

Figure 14: Catchment area

Table 7: Composition of major industrial units in the catchment

Type	Key Players
Steel and Non Ferrous Metal Plants	▶ Met trade Ltd., Dhamtal (Kangra) ▶ Steel Authority India Limited(SAIL), Kandrori (Kangra) ▶ Crest Steel & Power (P) Ltd., (Una) ▶ Salsan Steel Pvt. Ltd., (Una)

Engineering units	▶ Gabriel (Parwanoo) ▶ International Cars and Motors Limited (Una) ▶ Purolator, Parwanoo ▶ Blue Star India (Una) ▶ Spray Engineering Device Limited (Baddi) ▶ TVS Motors Company (Nalagarh) ▶ Deepak Power Storage Enterprises (Kangra)
Cement Plants	▶ Jay Pee Himachal Cements, Baggi (Solan) ▶ Ambuja Cement Ltd. Rouri (Solan) ▶ Ambuja Cement Ltd. Suli, (Solan) ▶ ACC Ltd. Gaggal Cement works, Works Unit I and II, Barmana (Bilaspur) ▶ Ultra Tech Cements Ltd. (Mandi)
Pharmaceuticals Industries	▶ Ranbaxy Laboratories (Sirmaur) ▶ Cipla(Baddi) ▶ Dr Reddy"s Laboratories(DRL) (Baddi) ▶ Panacea Biotec, (Baddi) ▶ Gopal Life sciences(Baddi) ▶ Morepen(Parwanno, Baddi, Masulkhana) ▶ Mankind Pharmaceuticals(Sirmaur) ▶ Fem Care Pharma Limited (Solan) ▶ Indoco Remedies (Baddi) ▶ Promed (Solan) ▶ Alkem Laboratories (Baddi) ▶ Ozone Ayurvedics (Baddi) ▶ Dabur ▶ Zydus Cadila (Baddi)
IT and Electronics Industries	▶ Himachal Futuristic Communication Limited (Solan) ▶ Microtek International Parwanoo (Solan) ▶ Luminous Tele Infra Limited (Una) ▶ WeP Peripherals Limited (Baddi) ▶ Spice Mobile (Baddi)
Textile Industries	▶ Birla Textile Mills (Baddi) ▶ Winsome Groups (Baddi) ▶ Vardhman Groups (Baddi) ▶ Malwa Cotton (Paonta Sahib) ▶ Himtex Textiles Private Ltd. (Una) ▶ Sara Textiles Ltd. (Nalagarh)

	▶ Himachal Fibre Ltd. (Solan) ▶ Nirmal Furnishing Fabrics (Baddi) ▶ GPI Textiles (Nalagarh)

Around 97% of all industrial units in Baddi and its surrounding areas consist of Micro and Small units. Whereas, 2% account for Medium industrial units and the remaining 1% make up the large industrial companies. The tables below showcase the MSME units in the focus sectors defined above across the catchment area defined.

Table 8: MSME Units in Focus Sectors

District	Total MSME Units	MSME units in Focus Sector
Kangra	8871	1918
Solan	3138	204
Una	2133	280
Bilaspur	1829	111
Chandigarh	110	48
Total	16081	2561

Table 9: Sector-wise spread of MSMEs in key districts

District	Engineering Units	Metal Based(Steel Fab.)	Minerals Based	Grand Total
Kangra	1406	150	362	1918
Solan	83	121	-	204
Una	152	124	4	280
Bilaspur	-	108	3	111
Chandigarh	4	44	-	48
Total	1645	547	369	2561

Source: District Industries Centre, District Industrial profiles-MSME

Districts expected to be served by the proposed Baddi TC would be Solan and its catchment area including Kangra, Una, Bilaspur. Key highlights of the catchment area have been presented in the table below.

Table 10: Catchment Area Profile

District & No. of MSMEs[20]	District Profile	Units in General Engineering Sector	Key highlights
Kangra (8,871)	▶ Kangra has strong base of MSMEs in Minerals, Metal based (steel Fabrication) and Engineering Units. ▶ The district is home to 7 industrial zones catering to more than 600 units ranging from large to micro industries.	▶ The total numbers of MSME units in the districts catering to General Engineering sector are 1816. ▶ There are around 40 units in Iron & Steel Cluster and 26 units of steel furniture in the Kangra districts. ▶ Mineral based industry contributes around 150 units to the district ▶ Large scale industries are mainly present in steel and non-ferrous metal.	▶ The presence of Met trade Ltd. at Damtal for non-ferrous metal production is helping many micro and small units to come up through both forward and backward linkage. ▶ Other large unit that are in the process to set up a production plant include Steel Authority India Limited(SAIL) at Kandrori.
Solan (5,731)	▶ Auto component units are mainly based in Parwanoo. ▶ There are seven industrial areas/estates in the district as; • Parwanoo • Industrial Estate, Chambaghat • Electronic complex, Chambaghat • Industrial estate, waknaghat • Industrial Area Hamleog • Industrial Area	▶ The district has 204 MSMEs in the General Engineering, Metal and minerals based sector. ▶ Large scale industries are mostly present in the Cement and Pharmaceutical sector ▶ Parwanoo has a high density of general engineering & light engineering industries. ▶ Jay Pee Himachal Cements, Baggi, Ambuja Cement Ltd. Rouri, Ambuja Cement Ltd. Suli, are the big cement plants	▶ Presence of large Limestone deposits leads to the rapid development of the many large and medium scale industries in the districts. ▶ The district has a large base of skilled labour, making it a favourable destination for knowledge-based sectors. It also has a large pool of semi-skilled and unskilled labour

[20] DCMSME District Industrial profiles

	Banalgi ▶ Industrial corridor stretching from Barotiwala to Nalagarh along the western border of Solan district making Baddi a strategic location for Industrial investment	in the districts. ▶ Baddi makes up almost half of the number of MSME units in the state (2,162)	▶ There are around 70 Colleges, 76 Industrial Training Institutes, 9 Polytechnics colleges and various other technical institution present in the state.[6]
Una (2,133)	▶ The district is situated in the East-North of the state and is surrounded by district(s) Bilaspur, Hamirpur and Kangra in the North and the west which offers better facilities for manufacturing units in the districts. ▶ The district has eight industrial areas/estates, which house over 250 industrial units ▶ Una has good connectivity by road from Shimla, Chandigarh, New Delhi and Pathankot. The district is connected by a broad gauge railway line, which is the only one in the state	▶ There are around 280 General Engineering, Metal and minerals based MSMEs in the districts ▶ The majority of units in the district consist of Metal based (Steel Fabrication), Engineering Units, wood/wooden based furniture and Rubber, plastic & petro based Industries ▶ Tooling requirement arises majorly from the engineering units in the district ▶ Kala Amb in Paonta Sahib has a large number of steel fabrication mills	▶ Crest Steel & Power (P) Ltd., International Car & Motors Ltd., Salsan Steel Pvt. Ltd. and Pritika Auto cast Pvt. Ltd., are some of the large and medium scale industries in the district ▶ An airport-based SEZ was proposed over an area of 3,230 hectares in Una ▶ Poliyan Mega Food Park Pvt. Ltd.) and Himachal Integrated Mega Food Park Pvt. Ltd. are the two Mega Food Park project in Haroli and Dulehar respectively that is expected in the district of Una. These food parks will provide the foundation for upcoming agro processing industry in Himachal Pradesh

Bilaspur (19,068)	▶ The district has rich deposits of Limestone and shale. Total Limestone deposits in Bilaspur districts is around 1020 Million tonnes which constitutes to10% of the state's total Limestone reserves (~9700 Million tonnes) ▶ The district has two industrial areas/estates	▶ There are total of 1182 General Engineering and minerals based MSMEs in the district ▶ Large and medium scale industries are mainly present in cement and steel fabrication sectors	▶ ACC Ltd. Gaggal Cement works, Works Unit I and II, Barmana and SPS Steel power Ltd., are the two large cement players in the district that caters to MSMEs in that sector
Chandigarh (113)	▶ There are two Industrial Areas in the Union Territory that house around 1966 units ▶ Industrial Association of Chandigarh, PHD Chamber of Commerce and Industry (PHDCCI), Chamber of Industrial & Commercial Undertaking (CICU) are some of the industrial associations present in the UT	▶ There are around 44 metal based and 4 General engineering MSMEs in the area ▶ Light engineering industry is heavily represented. There are large number of units manufacturing agriculture equipment, auto parts, tyres & tubes, electric meters and engineering items such as Bars, rod of steel and rolled products ▶ Van Norman Machines, Avery Free wheels Pvt. Ltd., Micron Instruments Pvt. Ltd., and Valco Industries Ltd., Nectar Life Science Ltd. Are some of the large scale enterprises present in the UT	▶ A mega logistics park of over 150 acres with a INR 500 Cr investment is expected to be established in Chandigarh – Promote high-tech manufacturing, logistics and supply chain manufacturing facilities ▶ A science park is planned to be set up in the UT that will provide common testing facilities not available in the market. These facilities will include research and incubator facilities etc.

In addition the surrounding catchment areas detailed above, added is a detailed outine of the situation of MSME sectors in Baddi. The table below will display a sector-wise breakup of MSME units and the respective employment in each of the sectors. These data points will provide a clear picture of the MSME situation and potential local customers for the proposed TC in Baddi.

Table 11: MSMEs sector-wise

Sr. No[21]	Sector Category	No. of Units	Employment (in No.s)	Investment (INR Cr)
1	Pharmaceuticals	181	14,919	4,331
2	Packaging	197	3,018	872
3	Plastics	192	3,348	923
4	Electrical Goods	161	4,891	85
5	Auto Ancillary/Misc. Engineering	179	4,909	775
6	Soap & Cosmetics	106	4,072	910
7	Electronics	83	2,846	366
8	Textiles	97	11,233	1,377
9	Food processing	139	3,350	721
10	Footwear	36	3,407	131
11	Steel	24	621	286
12	Chemical	32	1,176	73
13	Cement	4	1,831	594
14	Automobiles	12	2,272	194
15	Others	618	8,016	1,751
	TOTAL	2162	69,909	13,394

[21] Director of Industries, Baddi

5.2.2. Market in other potential sectors in catchment

Aside from the key sectors explored in the previous section, upcoming sectors in manufacturing and services are potential growth sectors in the defined catchment area. Some of the additional sectors to be discussed are pharmaceutical, packaging, food processing etc. Baddi, Barotiwala and Nalagarh areas in Solan are some of the existing areas that have an existing presence of these sectors.

The following sectors to be analysed are:

a) Plastic and Packaging Industry

Plastic processing in Himachal Pradesh is growing at a progressive rate because of the availability of the feedstock and higher focus on the manufacturing sector. In the packaging sector, India's leading corrugated box manufacturing group Horizon Packs has set up their packaging unit Monad Technologies Pvt. Ltd. at Baddi. They are the largest corrugated manufacturers of this region. Around 1056[22] small, medium and large scale units in packaging and 1030 small, medium and large scale units in plastic sector across the state had been approved after the special package incentives in Himachal Pradesh[23].

The major tooling requirement arises from the various type of techniques used to manufacture finished products that include Extrusion, Injection moulding, Blow moulding and Roto moulding etc. The proposed TC at Baddi can help these small and medium plastic industries regarding the automaticity of the machines and availability of the skilled labour.

Table 12: Classification of plastic product by the type of process

	Type of Process	Product Manufacture
Plastic and Packaging Products	Extrusion	Films and Sheets, Fibre and Filaments Pipes.
	Injection Moulding	Plastics items for Industrial usage, FMCGs, White Goods, Kitchen and domestic items
	Blow Moulding	Bottles, containers, Toys and House wares
	Roto Moulding	Large circular tanks such as water tanks

[22] DIPP Industrial profiles
[23] Press Information Bureau, Ministry of Commerce & Industry

b) Biotechnology and Nanotechnology Industries

Biotechnology is one of those sectors that has potential for future growth, and the state of Himachal Pradesh expects enterprises to manufacture industrial products using biotechnology process and processing laboratories or Research and Development activity related to processing. The state has the capacity to develop various types of BT industries using raw material base of fruits, vegetables, high value cash crops and other naturally growing herbal plants. These industries can contribute to sectors such as, bio-pharmaceuticals, phyto- chemicals, bio-prospecting, fermentation, post-harvest processing, bio-processing, pharmaceuticals, biochemical etc. Location of the state is a major advantage for this sector due to the rich animal and microbial biodiversity.

The State is currently in the process of setting up two separate biotechnology parks one between Solan and Shimla and another between Shahpur and Jogindernagar in association with the private sector to boost biotechnology based ventures. These ventures will enable the state to transform into an attractive destination for setting up industrial and supporting infrastructure units. The development of these biotechnology parks and big pharmaceuticals industries could lead to an increase in demand for skilled labour, since these industries require workers to operate and maintain high-precision machines. The proposed TC would then be in an ideal position to gauge the market beforehand to be able to offer pharmaceutical/biotechnology centric courses to students.

Some of the large scale pharmaceutical firms in the state are shown in the table below. An observation from the table is that most of these companies are based in and around Baddi. This is an indication that the area should expect a growth in the number of MSME units for the biotech and pharmaceutical sectors.

Table 13: Pharmaceutical Sector

Sr. No.	Pharmaceutical Company	Location
1	Ranbaxy Labs	Sirmaur
2	Cipla	Baddi
3	Trent Pharmaceuticals	Baddi
4	Dr Reddy's Lab	Baddi
5	Panacea Biotech	Baddi
6	Gopal Life Sciences	Baddi
7	Morepen	Parwanoo, Baddi, Masulkhana
8	Mankind Pharmaceuticals	Sirmaur
9	Fem Care Pharma Ltd.	Solan
10	Indoco Remidies	Baddi
11	Promed	Solan

12	Alkem Laboratories	Baddi
13	Ozone Ayurvedics	Baddi
14	Zydus Cadila	Baddi

c) Food Processing Industries

Agriculture and horticulture is the backbone of the state's economy. This sector employs around 71[24] percent of the working population and income from the agriculture and allied sectors make up around 30[25] percent of the total state GDP. The topographical variations and altitudinal differences coupled with fertile, deep and well-drained soils favour the cultivation of temperate to sub-tropical fruits.

Under the Mega Food Parks Scheme, The Ministry of Food Processing Industries (MoFPI) has awarded approvals to Poliyan Mega Food Park Pvt. Ltd. (over 51 acre of land and with an investment of Rs. 100 crore) and Himachal Integrated Mega Food Park Pvt. Ltd. for setting up a mega food park project in Haroli and Dulehar respectively District, Una. Additional, there are cold chain Projects being implemented under the MoFPI assistance, in which the ministry has approved 10 cold chain projects that are at different stages of implementation. Agri Export Zones have been planned by state government mainly for apples in Kinnaur, Shimla, Sirmor, Kulu, Mandi and Chamba.[11]These food parks provide the foundation of upcoming agro processing industry in Himachal Pradesh.

The food processing industry in the state will aid the growth of both Agro processing sector (Training, component and design consultancy) and Agricultural equipment sector (Tooling and die cast assistance). Himachal Pradesh's vibrant agriculture sector offers various opportunities for the successful establishment of potentially profitable agro-processing units.

The key players in food processing industry in the state are as;

Table 14: Agro Processing Sector

Sr. No.	Agro processing Company	Location
1	Adani agri Fresh	Shimla
2	Reliance	State-wide
3	Dharampal Satyapal Group	Solan
4	HP Horticulture Produce Processing & Marketing Corp. (HPMC)	State-wide
5	Nestle India	Tahiwal
6	Dabur	Baddi

[24] Himachal Pradesh, Department of Agriculture
[25] Himachal Pradesh, Department of Agriculture

7	Mahaan Group	State-wide
8	Himalayan Organics	Kullu

Special Economic Zones[26]

The government has proposed to set up three SEZs in Kangra, Una and Solan districts. Among the three SEZs, Kangra was proposed to be established over an area of 100 hectares, and the SEZ in Solan, which is a multi-product SEZ, has been established over an area of 3,230 hectares. The total estimated cost of these three SEZs are around US$ 1.8 billion.[14]These SEZs will further increase the demand of manufacturing industries and Technical services in the state. The Government of Himachal Pradesh has also proposed an IT/ITES SEZ in Shimla for an investment of around INR 280 Cr.

Inland container depot

The ICD at Sheetalpur village in Baddi (Himachal Pradesh) was developed for the benefit of exporting industries through Container Corporation of India for projects with an estimated cost of around Rs.53 crore facilitates. The ICD will help industrialists in saving freight charges as well as ensure timely delivery of consignment. The platform, can handle around 1,000 containers on an average in transit (at a time). This initiative by the state government will promote more industries to set up their manufacturing units in the state.

5.2.3. Market outside catchment area

Going forward, in addition to the MSMEs in existing sectors (General Engineering and Pharma Industries), Baddi TC can also focus on MSMEs in other sectors outside the catchment area. Typical opportunities for TCs outside the catchment in existing and new sectors are sourced from existing and proposed industrial zones in this area.

Listed below are some of the potential sectors:

a) Hydro Power

Himachal Pradesh is rich in Hydro power resources, and the state contributes to around 25 percent of the national potential in the sector. According to estimates, the state has the potential to generate 23,000 MW of hydro power by constructing various hydro projects on river basins. The largest potential for electricity generation lies on the river Satluj (10,361 MW), followed by Beas (5,357 MW), Chenab (2,973 MW) and Ravi (2,958 MW). Hydro power is a priority for the state

[26] IBEF report on Himachal Pradesh

government as an alternative form of energy generation. One the major projects on the Sutlej river basin has a capacity of 15,000 MW.

The State Government has taken several initiatives to encourage private sector participation in small hydro power development. Till August 2014, there were around 475 small hydro Electric Projects with an average capacity of 1208.62 MW. These hydro power initiatives taken up by the state government provide a major push to the hydro energy sector in the state. Along with the development of this sector, the growth will also initiate the development of various mechanical engineering, electrical equipment, and foundry & forging sectors in and around the area.

b) IT and Electronics Industry:

Himachal Pradesh's IT policy and the incentives offered to the IT industry make the state an attractive destination for the industry. The state has proposed to set up software technology parks in Shimla with an investment of around INR 200 Cr. The state has launched a venture capital fund dedicated to the IT industry with a corpus of around INR 31 Cr. It is funded by the Small Industries Development Bank of India (SIDBI) and other state government agencies. These IT parks are expected to encourage and support manufacturing of hardware and software. It will also offer the necessary infrastructure to facilitate communication and connectivity. Big key player which have their large scale units in the state are Microtek International, Luminious TeleInfra and WeP Peripherals Ltd.

5.2.4. Prospective Mega projects in and around Baddi[27]

- TVS Motor Company has plans to set up an engine manufacturing plant in Himachal Pradesh over 50 acre of land. The unit will require an investment of Rs 150 crore and will take the company's total investment in the state to around Rs 270 crore. TVS Motor Company already has a two wheeler manufacturing plant at Nalagarh in Solan district of Himachal Pradesh. This automobile plant will aid the growth of the MSMEs in automotive, electrical, foundry and forging, general engineering sectors. The tooling requirement arises from the type of products manufactured like spring leaves, steel tubes, all kinds of metal auto parts, cranes, fans, exhaust systems, heat exchanger etc. The major key tooling segments are in sheet metal, plastic moulds, pressure die casting, forging tools. These big automobile manufacturing industries will also help to develop various engineering cluster(auto components, downstream iron and steel) in the nearby area.

[27] News articles

- Puri Group is planning to raise about Rs.140 crore to fund a 14 MW hydropower project in Himachal Pradesh. The group has already availed of techno-economic clearances for the 14 MW run-of-the-river hydro projects at Uhl Ghat, in Himachal Pradesh. It has already commissioned three projects with a combined capacity of 5 MW at an investment of Rs 60 crore. Next, it plans to start working on commissioning a 7.5 MW project at Killibehl-Kullum in Himachal Pradesh.

- Havells India, a fast moving electrical goods (FMEG) company, is planning to invest Rs 100 crore to double the production capacity of its manufacturing plant at Baddi in Himachal Pradesh. Baddi plant of the company produces switch gears and switches.

- The Central Government grants financial assistance of Rs 200 crore for industrial projects under various schemes in Himachal Pradesh, including establishment of two new industrial townships in the state. The Centre will provide financial assistance of Rs 100 crore to these two new industrial townships at Kandrori in Kangra and Pandoga in Una district, which are estimated to cost Rs 218 crore.

- The Union Ministry for Industry and Commerce also approved industrial infrastructure projects worth Rs72.17crore, for setting up of an export warehouse and a composite pharma-testing laboratory at Baddi, along with upgrade of the power grid at the export promotion park.

- Gurdaspur Traders is looking forward to establishing a cold storage facility with a capacity of 5,000 tonne at Indora industrial area, in Kangra district of Himachal Pradesh. The company has acquired two acre for the project. The project is expected to cost around Rs 20 crore. At present, the company is scouting for a civil contractor and a machinery supplier for the project. Civil work is expected for completion in 2015.

- The Himachal Pradesh government granted clearance to eight additional new industrial proposals, besides one expansion proposal. All these entail a total investment of Rs 1,244 crore, including a Rs 630-crore plant by Micromax Energy Ltd. which will manufacture solar energy cells, Cipla Ltd. with a Rs 270-crore investment to manufacture pharmaceutical and herbal medicines and Shivalik Bimetal Controls to invest over Rs 20 crore will make bonded clad strips. While Sun Juice will invest over Rs 51 crore and will set up juice and milk processing and packaging units.

- Mahindra & Mahindra has proposed setting up Arts and crafts village and expanding resorts in lower belt of Himachal Pradesh while Amarson Ltd. and Meridian Group have offered an investment of Rs 600-700 crore with interest-area in Solar and Bio Mass energy. There were other companies including Tata which have shown keen interest to invest in Himachal Pradesh

- A textile park would be set up in Una district with an investment of Rs 350 crore which would provide 2,000 jobs and indirect employment to 10,000 others.

The table below details investments that have gone into various sectors in Baddi and the defined catchment areas. The investments indicate a flourishing industrial region with potential for greater investment by industries in the future. The proposed TC will be able to cater to industries across the board.

Table 15: Recent Investments in Himachal Pradesh in different sector

Sector	Name of Company	Investment	Key Highlights
Automobile	TVS Motors	Rs. 150 Crore	Plans to set up an engine manufacturing plant over an area of 50 acres. The Company already has a two wheeler manufacturing plant at Nalagarh in Solan district of Himachal Pradesh.
Hydro-Power	Puri Group	Rs. 140 crore	Planning to fund a 14 MW hydropower project in Himachal Pradesh. It has already commissioned three projects with a combined capacity of 5 MW at an investment of Rs 60 crore
Electrical	Havells	Rs. 100 Crore	Planning to double the production capacity of its manufacturing plant at Baddi which currently produces switch gears and switches
Energy	Amarson Ltd.	Rs. 600-700 Crore	Offered an investment in the Bio Mass and Solar energy
Textile		Rs. 350 crore	An investment by the government to open up a Textile Park in Una District
IT	Government of Himachal Pradesh	US$ 4.2 million	The state has launched a venture capital fund funded jointly by SIDBI dedicated to the IT Industry.

	and SIDBI		
Energy	Micromax Energy Ltd.	Rs. 630Crore	The Himachal Pradesh granted clearance to set up a Solar Energy cell manufacturing unit.
Pharma	Cipla Ltd	Rs. 270 Crore	These companies invested to manufacture pharmaceuticals and herbal medicines
	Alkem Laboratories	Rs. 60 Crore	
	Indico Remedies	Rs 25 Crore	
	Unichem Labs	Rs. 72 Crore	

Regulatory Approvals required

6. Clearances required and respective authorities

The proposed TC at Baddi is one of the first Greenfield projects proposed under TCSP. This would include development of physical infrastructure including facilities like production, training, administration, hostel, canteen, utilities etc. keeping in view the long-term sustainability. The same would require clearances at different levels during construction such as approval of layout plan, environmental clearance, electricity and water supply connection, health and safety clearance and other associated clearances. Obtaining these clearances would be crucial for timely completion of the project and therefore needs to be planned well in advance. The following table gives indicative details of the various clearances along with the respective approving authorities and the tentative time required. However, considering that land has already been allotted to O/o DC-MSME for development of TC, some of these regulations may not be applicable.

Table 16: Clearances required and respective authorities

S. No	Required clearance/ approvals[28]	Department /agency	Tentative time limit for approval (days)
1.	Registration under VAT Act	Commercial Taxes Department	24 hours
2.	Registration under CST Act	Commercial Taxes Department	24 hours
3.	Tax Clearance Certificate	Commercial Taxes Department	1 day in case of non-default of tax payment
4.	Land conversion - Conversion of land use	Revenue Department	30 days for up to 10 hectares 60 days for above 10 hectares
5.	Land Allotment	Revenue Department	30 days if allotment is to be made at the District Level 60 days in case Government's approval is required
6.	Allotment of plots in Industrial Areas	BBNIA/ State department	30 days
7.	Issue of NOC to the authority concerned regarding conversion of land use	BBNIA/ State department	15 days
8.	Environmental Clearance (Consent of Air and Water Pollution)	Ministry of Environment and Forests	Site/environment clearance: 90 days, NOC to establish: 45 days, NOC to operate: 30 days, Renewal of consent: 30 days
9.	Electricity	BBNIA/ State	Loads up to 60 HP: 66 days, Loads

[28] Indicative list of clearances/ approvals

S. No	Required clearance/ approvals[28]	Department /agency	Tentative time limit for approval (days)
	Connection	department	above 60 HP and up to 300 KW: 90 days, Loads above 300 HP and up to 3000 KW: 180 days, Load above 3000 KW and up to 33KV: 375 days
10.	Water connection	SIPB/DIPC	NA
11.	Fire safety	BBNIA/ State department	NA
12.	Approval of place and for permission to construct building under the Factories Act)	BBNIA/ State department	NA
13.	Approval of factory layout plan under factories Act, 1948	Labour and Employment Department – Factories and Boilers Inspectorate	30 days
14.	License for running the factory	Labour and Employment Department	45 days
15.	Registration of shops and commercial establishments	Labour and Employment Department - Labour Department	10 days
16.	Permission to establishments having more than 50 labours under Industrial Employment	Labour and Employment Department - Labour Department	45 days
17.	Lift	BBNIA/ State department	NA
18.	Borewell	Central Ground Water Authority	NA
19.	Society registration	Indian societies registration act 1860	NA

Manpower and Human Resource requirement

7. Manpower and Human Resource development

The success of an institute or an organization majorly depends upon the skill set and experienced human resource available with them. Hence, it's planning, recruitment and development is one of the most important aspects while designing a new Technology Centre. As a part of the study we have analysed organizational structures of some of the existing Technology Centres to understand the major functional areas, number and level of employees, contractual staff and other related aspects. In continuation, we have also discussed the same with O/o DC-MSME and some of the heads/GMs of the existing TRs.

As per the existing structure, there are following functional areas/streams in a TR:

- Production
- Design
- Training
- Consultancy and Marketing
- Administration and Accounting

The level of employee heading a particular Functional area/stream/department varies in some of the TCs. In an Indo German TR Administration and Accounting is head by a Manager while in Indo Danish TCs this is being headed by a Senior Manager. Sanctioned employee strength in these existing TCs typically varies from 110-120.

7.1. Proposed organization structure

While analysing the existing organizational structures and designing the new one, we have taken some considerations into account which have been discussed and validated with the O/o DC-MSME. Some of the key considerations are as below:

- As per the decision taken in the Empowered Finance Committee, the total sanctioned strength for any new TC would be 60 in contrary to the existing ones which have total sanctioned strength of 110-120.
- In the proposed organizational structure for Baddi TC, the main revenue streams are Production, Design and Consultancy and Training. These departments will be headed by Senior Managers who would directly report to GM/DGM.
- In contrary to the existing structures and target of sanctioned employee strength of not more than 60, we have proposed only 7 levels as compares to the existing structures which have 9 levels in the hierarchy. Below these levels, the resources will be hired as contractual employees on need basis.
- In the existing structure consultancy and marketing department were clubbed into one, but in the proposed structure for Baddi TC it has been proposed to have marketing as a separate department and consultancy be clubbed with the design department. This has been done after

having discussions with some heads/GMs of the existing MSME TRs and understanding the customer requirements to meet the technical experts while pitching for any consulting assignment. Moreover, production projects' catering to component manufacturing or tool designing requires consulting. Most of these projects are mutually exclusive with less replicability across designs.

- The other two departments namely, Marketing and Administration and Accounting are proposed to be headed by Manager level position and they will directly report to GM/DGM. This has been done as the administration and accounts department is lean and a manager level employee would be able to manage the same. Also, as stated above, the total sanctioned strength cannot exceed 60.
- To achieve the envisaged objectives of TCSP, equal focus should be given on all the three pillars namely, production, training and business advisory. Consistent efforts will have to be made to optimize the revenue from all these areas. With this is in mind, the design and consulting department have been strengthened with a sanctioned strength of 7 experts which will mainly work in the areas of Design support, Quality systems support, Product development and engineering solutions, Project consultancy in setting up of TR, training centre and others. These experts will be supported by internal production team and external experts on need basis.
- In contrary to the sanctioned strength (4-5 employees) in marketing department of many existing TCs, the sanctioned employee strength in the proposed structure has been reduced to 2 only (1 Manager and 1 officer sales). This has been proposed keeping in mind that the GM or Deputy General Manager will devote his/her significant time in marketing and sales. Also, the respective departmental heads (Senior Managers) will be responsible for the sales and marketing efforts of their departments. Moreover, above all TCSP aims to hire Cluster Network Manager to facilitate all the market linkages for the proposed TC. The role of CNM for marketing would be very crucial and it will act as an additional arm of the marketing wing of the proposed TC. Considering all the above factors into account, a lean marketing department has been proposed for the proposed Baddi TC.
- The maintenance manager though will be a part of the production department but will have an added responsibility to support the maintenance of machines in the training department as well. He/she will be supported by 1 Senior Engineer and 2 Senior Technicians.
- Based on our discussions with the O/o DC-MSME and heads of the existing MSME TCs, there was a need for dedicated manager for the short term trainings. In the structure for Baddi TC, we have proposed separate manager for mechanical, electronics and short term trainings. Keeping in mind the scale and the number of trainees in the short term courses (both mechanical and electronics), the manager short term would mainly be responsible for administration, planning, quality control, issue of certificate to trainees, fee collection and others. Even one of the managers (from mechanical and electronics) would be additionally responsible for placement of

students which will include industry interaction, managing training and placement, delivering presentations etc.

- While estimating the numbers we have considered the following considerations:
  - The final semester trainees of Tool Design and Manufacturing course would also work with the design and consultancy department. This will help them in getting the hands-on experience and will also provide support the department
  - In continuation to the above, even the final semester trainees of Diploma in Tool & Die making, Post Diploma in Tool Design, Post diploma in Tool Manufacturing and CNC Machinist would work in the production department depending upon the skill set and interest area.
  - In addition to the regular employees, the training department will have the maximum number of contractual faculty in the form of guest faculty and full time contractual faculty. The figure for number of contractual faculty have been arrived at by taking various factors into account namely – existing employees in training and production, the number of courses vis-à-vis the number of trainees, trainee to teacher ratio, projected revenue numbers over the years, number of shifts in production vis-à-vis the utilization and others. The TC will sub-contract the assistants in the administration, accounts and stores department for providing the support to the departmental team on day to day basis.
  - The requirement of staff for the house-keeping and security will be outsourced to a third party agency on yearly contract basis

Based on the considerations stated above, the organisational chart in figure 30 demonstrates the target organizational structure to be achieved in 5 years (by 2020-21) from inception. Though, we have provided the figures till 2025-26 since we are estimating the revenue and expenditures for next 10 years.

As highlighted above, the proposed Technology Centre at Baddi will be divided into five functional areas/departments. These are:

- Production
- Training
- Design and consultancy
- Marketing
- Admin and Accounting

It is recommended that the GM and the DGM divide these five areas/departments between them, depending on competency, work-load and previous experience. Overall GM would be responsible for the management and financial health of the TC.

The chart consists of 5 levels in addition to the General Manager (GM) and the Deputy General Manager (DGM).

- The third level consists of Senior Managers as the departmental heads of design and consulting, production and training. They will report directly to either the GM or the DGM, depending upon the division of departments within them.
- The fourth level will consist of Managers who will be supporting Senior Managers in their respective domains. But for marketing and admin and accounting department, as explained above manager will head this department and directly reporting to GM or DGM.
- The fifth level consists of senior engineers (Sr. Engg.) and Sr. Officers. Level six consists of engineers (Engg.) and officer / foreman.
- The final level consists of senior technicians with requisite operational level expertise.

The responsibilities of each position and qualifications required to fulfil roles are covered in the following section. Hence, the recommended final organisational structure for the proposed TC is based on experience from established MSME technology centres, discussions with O/o DC-MSME and heads of some of the existing TCs, expert opinion and knowledge and experience with organisational planning.

Table 17: Sanctioned strength of key resources

S. No.	Designation	Proposed Sanctioned Strength
1.	General Manager	1
2.	Deputy General Manager	1
Department		
3.	Administration and accounting	7
4.	Design and consultancy	6
5.	Production	18
6.	Training	25
7.	Marketing	2
	Total	60[29]

In addition to the above sanctioned strength, we have recommended additional employees as contractual employees. Based on the requirement, we have estimated around 171 contractual employees (159 in training & 12 in production) by end of FY 2026. The figure for number of contractual employees have been arrived at by taking various factors into account namely – existing employees in training and production, the number of courses vis-à-vis the number of trainees, trainee to teacher ratio, projected revenue numbers over the years, number of shifts in production vis-à-vis the utilization and others.

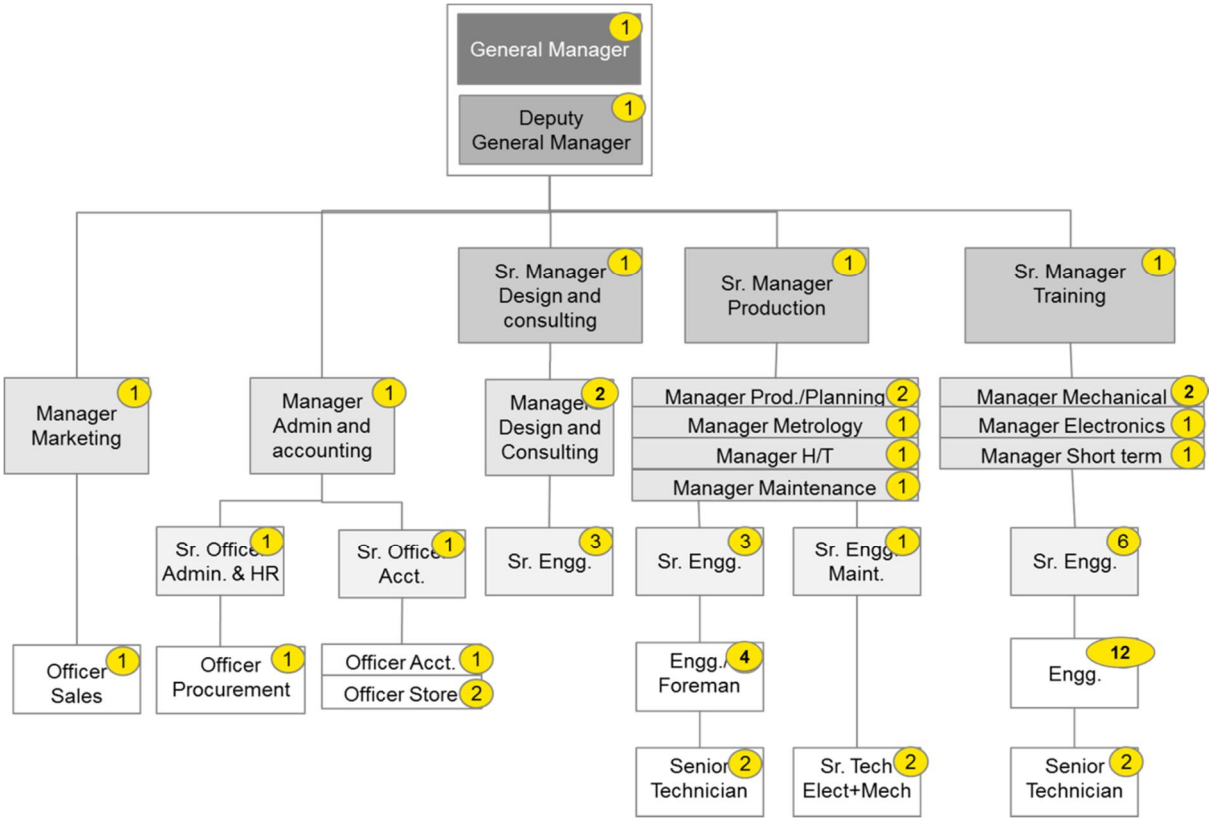
[29] The details and basis of number of employees is provided in the next section

While considering the ratio for trainee to teacher, we have used the following assumptions after discussion with existing GMs and O/o DC-MSME.

- Trainee to teacher ratio for theory classes – 60:1; with theory classes conducted for 20% of time
- Trainee to teacher ratio for practical classes – 20:1; with practical classes conducted for 80% of time

After calculating the weighted average of the above ratios we got the overall trainee to teacher ratio of 28:1. Post discussions, we have considered trainee to teacher ratio of 25:1 for calculating the number of employees in the training department (regular and contractual faculty) keeping in mind the employees who will be on leave at any given point of time.

Figure 15: Proposed organisation structure



7.2. Phase wise induction of human resources

As discussed in the above sections, the proposed TC will be have 60 employee as sanctioned strength and the target structure will be achieved within 5 years from 2015-16. Therefore due care has been taken during the study to phase the recruitment of employees. On the same lines, initially some positions have been proposed to be vacant when establishing the organisational structure of the TC. This has been proposed keeping in mind the time it will take to be fully operational. Vacant

positions will also create incentives for high performers to obtain higher positions when the time comes for fulfilling these.

The phase wise estimated staffing over next few years as part of human resource planning has been done through the identification and analysis of the various types of activities and skill sets required for smooth and efficient functioning of the proposed TC. Multiple rounds of discussions with industry experts, World Bank, O/o DC-MSME and heads of some of the existing MSME TCs have been undertaken to arrive at the requirement of human resources needed to meet the business objectives in the short and long term of the proposed TC.

The following provides the details of recruitment in various phases over next few years. This phasing is suggestive and can be modified based on the need and revenue generating capabilities of the TC during operations. Some of the considerations which have been taken into account while recommending the phasing of employees are as below:

- Year 2015-16: 2 staff members
  - GM will be involved in project implementation and work out the strategy for marketing, training, production and consultancy with the help of CNM and TP. GM will also monitor the progress of construction and procurement of machines etc. GM will also be responsible for planning of recruitment of required manpower.
  - Manager – Administration & Accounts will be responsible to get statutory registrations like sales tax and PF, opening of TC's bank account, getting power and water connection etc. Manger will also support GM in recruitment of people in the coming years.

- Year 2016-17: 20 staff-members
  - Three senior managers will be recruited to further recruit staffs in respective departments. These would also be responsible for orientation and training of respective staff members.
  - Senior officer - administration & HR will be recruited to support the GM and manager - administration and accounts for further recruitment of staff and forming of systems to conduct day to day administrative activities
  - The first long term training programme will commence this year and one senior engineer, one engineer and one senior technician will be recruited for installation of machines and conducting theory and practical training
  - By second half of this year, production and design staff will be recruited. The respective senior managers would be responsible for orientation and training of these staff members. These staff will undergo training (preferably at another Tool room at Aurangabad and/or Ahmedabad) for a period of 3-6 months to make them fully trained before start of the operations of the proposed TC
  - Manager - maintenance and senior technicians will be recruited to install and commission machines for production and training. They will also be responsible for installing the power supply system

- Stores and accounts officers will be recruited to maintain statutory records and support the operations

- Year 2017-18: 42 staff- member
  - Production will commence during this phase and hence more engineers and senior engineers will be recruited. The number of staff has been decided based on estimated number of machines commissioned during this phase and number of shifts in production
  - This year some short term training courses will commence along with the starting of the second year of the long term course.
  - Officer sales will be recruited to support manager marketing for preparation of detailed marketing plan of the TC. The staff would be engaged in various marketing activities for wider reach of the proposed TC across the region. This would be crucial for promotion of the TC and would help departments increase their revenue
  - The Design and Consultancy department has been planned to commence its commercial services during this year and hence manager and senior engineers will be recruited to meet the requirement.

- Year 2018-19: 52 staff members

The proposed TC would be fully operational by this period with activities in production, training, design and consultancy etc. Additional staff will be recruited for smooth undertaking of the gradual increase in the activities across all the departments.

It is recommended to leave the position of the DGM vacant initially. The position of the DGM can be filled by a high performing senior manager within design and consulting, production or training depending upon the requirement, skill set and experience.

Rest of the positions will be filled gradually as TC activity escalates and the manpower requirements increase. The tables below summarise the phasing of the organisational completion within each area; Administration and Accounting, Design and Consulting, Production, Training and Sales and Marketing, in addition to the positions of the GM and DGM. The numbers represent the numbers of employees within the specific position at a given point in time. The timeline spans from 2015 to 2026.

Table 18: Summary of phase wise induction of resources

Year	15-16	16-17	17-18	18-19	19-20	20-21	21-22	22-23	23-24	24-25	25-26
Full time employees											
Total	2	20	42	52	57	60	60	60	60	60	60
Contractual employees											
Total	-	3	21	44	75	108	119	131	144	151	159

Below tables depicts the hiring of number resources in every department every year starting from 2015-16 to 2025-26. In the year 2020-21, the TC is recommended to hire the complete sanctioned strength of 60 employees.

Table 19: Department wise induction of fulltime resources

General Manager							
Year	15-16	16-17	17-18	18-19	19-20	20-21	25-26
General Manager	1	1	1	1	1	1	1
Total	1	1	1	1	1	1	1
Deputy General Manager							
Year	15-16	16-17	17-18	18-19	19-20	20-21	25-26
Deputy GM	-	-	-	-	-	1	1
Total	0	0	0	0	0	1	1
Administration and Accounting							
Year	15-16	16-17	17-18	18-19	19-20	20-21	25-26
Manager Admin. and Accounting	1	1	1	1	1	1	1
Sr. Officer HR	-	-	-	-	-	1	1
Sr. Officer Accounting	-	1	1	1	1	1	1
Officer Procurement	-	-	1	1	1	1	1
Officer Store	-	1	1	2	2	2	2
Officer Admin	-	1	1	1	1	1	1
Total	1	4	5	6	6	7	7
Design and Consulting							
Year	15-16	16-17	17-18	18-19	19-20	20-21	25-26
Senior manager		1	1	1	1	1	1
Manager			2	2	3	3	3
Sr. Engg.			2	3	3	3	3
Total	0	1	5	6	7	7	7

Production							
Year	15-16	16-17	17-18	18-19	19-20	20-21	25-26
Senior Manager	-	1	1	1	1	1	1
Manager Prod/ Planning	-	-	1	1	2	2	2
Manager Metrology	-	-	1	1	1	1	1
Manager H/T	-	-	1	1	1	1	1
Manager Maintenance	-	1	1	1	1	1	1
Sr Engg. Maintenance	-	-	-	-	1	1	1
Sr Engg. Production	-	3	3	3	3	3	3
Engg. / Foreman	-	2	4	6	6	6	6
Senior Technician	-	1	2	2	2	2	2
Senior Technician Maintenance (Mech + Elect)	-	1	1	2	2	2	2
Total	0	9	15	18	20	20	20
Training							
Year	15-16	16-17	17-18	18-19	19-20	20-21	25-26
Senior Manager	-	1	1	1	1	1	1
Manager Mechanical	-	-	1	1	1	1	1
Manager Electronics	-	-	1	1	1	1	1
Manager Short term	-	-	-	-	-	1	1
Sr. Engg.	-	1	5	6	6	6	6
Engg.	-	1	4	8	10	10	10
Senior Technician	-	1	2	2	2	2	2
Total	0	4	14	19	21	22	22
Sales and Marketing							
Year	15-16	16-17	17-18	18-19	19-20	20-21	25-26
Manager Marketing	-	1	1	1	1	1	1
Officer Sales	-	-	1	1	1	1	1
Total	0	1	2	2	2	2	2

7.3. Roles and responsibilities

While conducting the study, we had series of discussions with the O/o DC-MSME and some heads/GMs of existing MSME TRs on the prospective roles and responsibilities of the employees for the Baddi TC. Below is summary of the suggestive roles and responsibilities (including the minimum qualification levels) of the individual employees which can be referred to while recruiting.

Table 20: Roles and responsibilities of proposed positions

Profile/ Designation	Minimum Qualification	Minimum Experience	Other Skill set/ requirements	Key Responsibilities
General Manager	B.Tech (Mechanical) with MBA or M.Tech	15 Years with 8 years in similar role	▶ Tool Manufacturing/Design/ Product development/ Training. ▶ Experience in Project Implementation will be preferred	▶ Over all responsible for the administration and financial health of the TC ▶ Key responsibility areas include (but not limited to); Marketing, Administration, HR, Accounts, Production, Design & consultancy etc. ▶ Responsibility for achieving the target KPIs set by the GC
Deputy General Manager	B.Tech (Mechanical) with MBA or M.Tech	12 Years with 5 years in similar role	▶ Tool Manufacturing/Design/ Product development/Training. ▶ Experience in Project Implementation will be preferred	Head of Production, Design, Consultancy and Training
Manager - Admin. and Accounting	CA/ICWA or MBA with bachelor's degree in Commerce/ Accounting / Finance	8 Years with 3 years in similar role	▶ Experience in the area of Administration, HR and Accounting ▶ The Manager must also have basic knowledge of government laws, regulations and state specific compliances ▶ Familiarity with ERP/accounting softwares	Head of Accounts, Administration and HR: ▶ General housekeeping of TC ▶ Bookkeeping, accounting and finance including financial analysis ▶ TC security ▶ Payroll ▶ Procurement management and store keeping
Sr. Officer - Admin. & HR	MBA or Equivalent	5 Years	▶ Experience in the area of HR and Administration ▶ Familiarity with Industrial laws and compliances	▶ Housekeeping of TC ▶ Security systems operation ▶ Transport System and management

Profile/ Designation	Minimum Qualification	Minimum Experience	Other Skill set/ requirements	Key Responsibilities
				▶ Payroll
Sr. Officer - Accounting	Bachelor's degree in commerce/Accounting / Finance with M.Com. or MBA	5 Years	▶ Experience in accounting and Tax ▶ Should be familiar with latest accounting software	▶ Bookkeeping and accounting ▶ Financial analysis
Officer - Accounting	M. Com. or MBA or Equivalent in Accounting	3 Years	▶ Experience in accounting and Tax. ▶ Should be familiar with latest accounting software	▶ Bookkeeping and accounting ▶ Handling of Cash, Banking etc.
Officer Store	Diploma in Mechanical or Equivalent	3 Years	▶ Experience in Store keeping, including inventory management ▶ Experience in Computer systems / software for store keeping operation	▶ Managing store ▶ Issue of consumable and non-consumable stores and keeping records
Officer Procurement	M. Com. or MBA or Equivalent	3 Years	▶ Experience in Procurement processes ▶ Knowledge of Govt. Procurement rules and processes will be desirable	▶ Procurement ▶ Vendor Development
Senior manager - Design & Consultancy	M.Tech in Mechanical engineering.	10 Years with 5 years in similar role	▶ Experience in product modelling, design, tool design ▶ Proficiency in one of the areas in Tool Design, either Sheet metal press tool or Plastic mould ▶ Practical Experience in use of CAD/CAM/CAE in product and tool design ▶ Experience of Tool trial ▶ Experience of assembly and inspection of Jigs and Fixtures ▶ Knowledge of Quality systems ▶ Experience in technical consultancy will be preferred	Responsible for designing tools, moulds and die casting w.r.t. ▶ New product development planning and its execution ▶ Quality systems ▶ Value engineering ▶ Tool try outs and proving ▶ Consultancy to MSMEs In charge of Incubation centre ▶ Helping members of Incubation centre in getting orders and execution of the same

Profile/ Designation	Minimum Qualification	Minimum Experience	Other Skill set/ requirements	Key Responsibilities
Manager-Design & Consultancy	B. Tech in Mechanical engineering.	8 years with 3 years in a similar role	▶ Experience in product modelling, design, tool design ▶ Proficiency in one of the areas in Tool Design, either Sheet metal press tool or Plastic mould ▶ Practical Experience in use of CAD/CAM/CAE in product and tool design ▶ Knowledge of Tool trial ▶ Experience of Jigs and Fixtures ▶ Knowledge of Quality systems ▶ Experience in technical consultancy will be preferred	▶ Designing tools, moulds and die casting ▶ Product development ▶ Quality systems ▶ Value engineering ▶ Tool try outs and proving ▶ Consultancy to MSMEs: Deliver functional consulting on assigned areas to ensure MSMEs are able to successfully use the solutions
Sr. Engineer-Design & Consultancy	B. Tech in Mechanical engineering	5 Years	▶ Experience with designing sheet metal tools, plastic moulds or die casting ▶ Knowledge of high end CAD software, analysis software and metrological instruments ▶ Experience of consultancy in the areas of product development, quality systems and value engineering	▶ Designing tools, moulds and die casting ▶ Product development ▶ Quality systems ▶ Value engineering ▶ Tool try outs and proving ▶ Consultancy to MSME
Sr. Manager Production	M. Tech. in Mechanical Engineering	10 Years with 5 years in similar role	▶ Experience with tooling or manufacturing and at least 3 years of leadership experience ▶ The Sr. Manager should have experience in metal or plastic mould and/or die casting ▶ The Sr. Manager should also have hands on experience with CAD and CEM software, and programming of CNC machines ▶ Experience to debug tool, analyse problems, root causes & take corrective improvement actions when tool is not able to produce as per part specifications	▶ Overall responsible for Production, production planning and control, including quality assurance of Tools and components, Tool trials etc. ▶ Overall responsible for relevant software CAD/CAM/CNC ▶ Overall responsible for machine maintenance and upkeep ▶ Ensuring on-time deliveries ▶ Deliver budgeted quantities as per required quality standards ▶ Manpower deployment and controlling manpower costs as per target

Profile/ Designation	Minimum Qualification	Minimum Experience	Other Skill set/ requirements	Key Responsibilities
Manager-Production	B. Tech in Mechanical Engineering	8 Years with 3 years in a similar role	► Experience with tooling or manufacturing ► Knowledge of metal or plastic mould and/or die casting ► Hands on experience with CAD and CAM software, and programming of CNC machines ► Experience to debug tool, analyse problems, root causes & take corrective improvement actions when tool is not able to produce as per part specifications	► Production ► CAD/CAM/CNC programming and operation ► Responsible for timely delivery of tools and components ► Responsible for Tool Trial ► Responsible for Consultancy to MSMEs ► Should have good knowledge of Quality and inspection
Manager-Production planning	B. Tech in Mechanical Engineering	8 Years with 3 years in a similar role	► Experience in tooling or manufacturing ► Experience in metal or plastic mould and/or die casting. ► Experience in CAD and CAM software, and programming of CNC machines ► Knowledge of ERP software	► Preparation of stage wise / machine wise scheduling in co-ordination with head of production team ► Production Planning and Control, and further despatching of jobs ► Estimate & manage to get raw materials and component requirements ► Responsible from issue of raw materials to despatch of final product to customers including routing
Manager-Metrology	B. Tech in Mechanical Engineering	8 Years with 3 years in a similar role	► Practical knowledge and experience of handling CMM and measuring Instruments ► Knowledge of Quality assurance and systems	Head of QC and metrology section with in production
Manager- Heat treatment (HT)	B. Tech in Metallurgy/Mechanical Engineering	8 Years with 3 years in a similar role	Practical Experience in heat treatment of engineering products including tool steel	Head of heat treatment section and responsible for heat treatment operation
Manager-Maintenance	B. Tech in Mechanical/ Electrical/	8 Years with 3 years in a	► Knowledge of Installation and commissioning of machines and equipment	► Head of Machinery maintenance including preventive maintenance, repair etc. of machines and equipment

Profile/ Designation	Minimum Qualification	Minimum Experience	Other Skill set/ requirements	Key Responsibilities
	Electronic Engineering	similar role	▶ Practical experience in preventive and repair maintenance of machines and equipment ▶ Practical experience of maintaining utility equipment like sub-station, UPS, water treatment plant, DG set etc.	▶ Responsible for Power supply, energy conservation water system in the campus
Senior Engineer-Production	B. Tech in Mechanical Engineering	5 Years	▶ Knowledge and experience in tool manufacturing, metal cutting through CNC programming and operation ▶ Experience of precision components ▶ Tool assembly ▶ Tool trial	▶ CNC machine programming and supervision of machining and assembly of tools ▶ Machinery maintenance ▶ Quality assurance ▶ Team work
Engineer-Production	Diploma in Tool & Die Making or Equivalent	3 years	▶ Knowledge and experience in tool manufacturing, metal cutting through CNC programming and operation ▶ Tool assembly ▶ Tool trial	▶ CNC machine programming and operation ▶ Assembly and trial of Tools
Foreman	Promotion from Senior Technician	3 years as Sr. Technician	▶ Knowledge and experience in tool manufacturing, metal cutting through CNC programming and operation ▶ Tool assembly ▶ Tool trial	▶ CNC machine programming and operation ▶ Assembly and trial of Tools
Senior Technician (Electrical maintenance / Mechanical maintenance/ tool assembly & manufacturing)	Diploma/ ITI in respective areas	1 year after Diploma or 5 Years after ITI in respective areas	Experience in Maintenance of machines and equipment (electronics or mechanical)/ Experience in CNC machine programming and operation/ Experience in Tool assembly and trial	▶ CNC machine programming and operation ▶ Assembly and trial of Tools ▶ Also work as Maintenance Technician in Mechanical/ Electronics
Senior Manager-Training	M. Tech. in Mechanical engineering	10 Years with 5 years in a similar role	▶ Experience with tooling / manufacturing and training in metal cutting / tool engineering / industrial automation	▶ Overall responsible for planning and executing training activities ▶ Overall responsible for designing curriculum

Profile/ Designation	Minimum Qualification	Minimum Experience	Other Skill set/ requirements	Key Responsibilities
			systems ► Experience with designing curriculum and preparing lecture plans and course material for long term and short term training and teaching	and preparing lecture plans and course material ► Responsible for Quality and Certification in training
Manager Training- mechanical/ Electronics	B. Tech. in Mechanical or Electronics or Electrical Engineering	8 years with 3 years in a similar role	► Experience with tooling / manufacturing and training in metal cutting / tool engineering / industrial automation systems ► Experience with designing of curriculum and preparing lecture plans and development of course material for long term and short term training and teaching	► Planning and implementing of training activities in manufacturing and tooling, Mechatronics, IT etc. including market assessment to discover training demand ► Evaluation of training activities and identify improvements ► Curriculum design ► Lecture plans and course material
Senior Engineer- Training	B. Tech. Mechanical or Electronics/ Electrical	5 Year	► Experience with tooling / manufacturing and training in metal cutting / tool engineering / industrial automation systems ► Experience with designing curriculum and preparing lecture plans and development of course material for long term and short term training and teaching experience ► Knowledge of CAD/CAM/CNC	► Undertake training courses in manufacturing/ tooling and related courses
Engineer- Training	Diploma in Tool & Die Making/Electron ics	3 Years	► Experience in tooling / manufacturing and training in metal cutting / tool engineering / industrial automation systems and teaching	► Undertake training courses ► Demonstrate practical skills to trainees ► Deliver theory lectures
Manager- Sales & Marketing	M. Tech. in Mechanical Engineering preferably with MBA	10 years with 5 years in similar role	► Marketing of TC product range ► Supporting Sr. Managers of respective departments to acquire orders ► Follow up with prospective and existing customers	► Plan and evaluate marketing activities towards all stakeholders ► Stakeholder analysis ► Sales according to targets
Sales Officer	BE/B. Tech	3 years	► Marketing of TC Products	► Execute marketing and sales activities

Profile/ Designation	Minimum Qualification	Minimum Experience	Other Skill set/ requirements	Key Responsibilities
	Mech. with MBA or Equivalent		► Customer Follow-up & Complaints ► Should be familiar with Computerised accounting procedures ► Feed Back, Dues Collection	► Sales invoicing, taxes etc.

7.4. Governance structure

7.4.1. Selection of the Governance Model for the new TCs

All the existing 18 TCs have been set up under the Societies Registration Act, 1860. The management of affairs mainly rest with the Governing Council constituted by MoMSME, Government of India with the Special Secretary and Development Commissioner of Ministry of Micro, Small and Medium scale Enterprises (DC-MSME) acting as the President of the Society and Chairman of the Governing Council (GC).

This arrangement has proved effective as most TCs have supported local MSMEs well and have performed financially. Each TC has a separate society and has very decentralised authority and governance structure. DC, MSME being chairman and other two members Director –Tool Room and representative of IF-wing of MoMSME are common members in all 18 GCs.

During the study and preparation phase of this DPR, we analysed different governance models for the new TCs. Under Indian law, there are three legal forms that exist for non-profit organisations. Mainly two forms are relevant for the purpose of the TCSP Program.

- Society as per society Registration Act, 1860
- Section 25 companies as per Companies Act, 1956

The two forms mentioned above have distinguishing features as per their respective acts.

Table 21: Comparison of Society Registration Act and Companies Act

Features	Registered Society	Not-for-profit Company u/s 25
Setting up and running cost	Nominal	Comparatively more than the society & trust
Formation	Simple	Takes 2-3 months, required to comply with provisions of Companies Act
Jurisdiction	Registrar of society	Registrar of companies
Meetings	Annual Meeting As per Law. Governing Body meeting as per the rules of Society.	Quite Extensive as per the provision of Company Law
Governance	Vests with governing body as per the rules framed by them. Law specifies no rules & regulation	Vests with Board of directors & management committee. Specific provisions for quorum, adoption, ratification and compliance
Membership transfer	Impossible	Free or control as per desire
Statutory Regulations	Limited	Exhaustive
Transparency	Transparent (As society act is not so exhaustive requiring statutory	Fully Transparent (The Companies Law is quite exhaustive requires specific

Features	Registered Society	Not-for-profit Company u/s 25
	compliance for each and every step of business operation)	compliance in each activity of business operation)
Perception commercial lenders	Less comfortable	More comfortable
Interest of commercial lenders	Less secured, as Act doesn't provide any rules regarding how the interest of lenders can be settled in the case of bankruptcy	More secured, as exhaustive provisions in companies act about how the interest of lenders can be secured by distributing the assets of the company in case of liquidation
Accountability	More (Can be established, if the rules, regulation and by-laws of the Society are framed in manner to fix accountabilities)	More, (As per the statutory regulations)
Financial Management & Disclosures	Best practices can be adopted through framing regulations. However, Act doesn't provide anything specific on this	Exhaustive provisions in Companies Act providing for financial management and disclosure policies
Modification of Objects	Easy Legal Procedure	Complicated legal procedure
Penalties	Lesser	Higher
External audits	Subject to lesser audit requirement. As Act doesn't provide for various kind of audits of the Society. However, generally the society provide for audit regulations and compliance to audit observations as part of their bye-laws and rules and regulations	Greater degree of control through Auditing framework as per companies Act. E.g. Statutory Audit, tax audit, cost audit etc.
Basic Document	Memorandum of Association Articles of Association with rules & regulations	Memorandum of Association Articles of Association

The Table above outlines difference in the two prominent governance structures. Generally, Companies are construed as more reliable legal entity in the commercial world or to attract private participants because the transparency inherits from the statute itself under which it is incorporated.

However, a society may also bring forward discipline by framing rules and regulations of the society through the governing body. This fact together with the minimal cost of setting up and running and simplicity in its formation makes the society a popular model in the case where purpose is not to finance the cost of the project but optimise the cost and delays.

The existing 18 TCs formed as per society model have made it proven model because of the following facts:

- Very clear cut authority flow and ownership by other GC members and GMs (as permanent member secretary). It instils competition among individual TCs to excel.

- The Incentive schemes work better in small groups (individual TCs). It also allowed better performing and surplus generating TCs to retain surplus fund and deploy them best suited to them.
- Rules and regulation framed by the societies fix the accountability of various authorities in organisation.
- Delegation of financial power has been developed which fix the authority of each of the officer in management body.
- Well established system for procurement is being followed as per GoI guidelines and GFR, 2005
- Matters have been identified on which decision van be taken only by the Governing Body.
- Annual accounts are audited by the statutory auditors well in time and audit report is placed and adopted by the Governing Body in its annual meeting
- Compliance to audit observations are strictly complied with and observed by the O/o DC-MSME

Overall the present system is working well and at this stage raising fund is not the sole purpose, it is recommended to continue with the societies for proposed Baddi TC with following few minor modifications

- Governing council can make provision for more membership from OEMs
- Provision of membership from state technical University who controls most private Engineering colleges
- One more sector expert in the GC
- GC usually meets once in six months only and it is suggested to have one executive committee or advisory committee consisting of local MSME/Cluster association members, sector experts and other stakeholders who can meet quarterly and can advise TCs and can also be delegated with powers higher then GMs

7.4.2. Composition of the Governing Council

As mentioned above, the proposed TC will be set up under the Societies Registration Act, 1860. The management of affairs primarily rest with the Governing Council constituted by MoMSME, Government of India with the Additional Secretary and Development Commissioner, Ministry of Micro, Small and Medium Enterprises (DC-MSME) acting as the President of the Society and Chairman of the Governing Council of each TC.

The Governing Council of TC will comprise four types of members as explained below:

Table 22: Governing Council of Baddi TC

Representation in the Governing Council	Suggestive recommendations
(i) Ex-officio members	
Representative from Government of India ▶ Development Commissioner, Ministry of MSME as Chairman, ▶ Industrial Advisor or Director of TR or Program Coordinator, ▶ Director DI-MSME of the respective States, ▶ Representative from Integrated Finance Wing of the Ministry of MSME. Representative from State Government ▶ Official from concerned industry department, ▶ Official from concerned department of technical education/training.	▶ Secretary, Industries ▶ Commissioner/Director, Technical Education & Training
(ii) Institutional members	
▶ Representative of state level industrial promotion body ▶ Representative of association of small scale industries ▶ Representative of the local chambers of commerce and industries/ Industry Promotion Institution/NSIC.	▶ Barotiwala Baddi Nalagarh Industries Association (B.B.N.I.A.) ▶ Himachal Pradesh State Industrial Development Corporation Ltd. (HPSID)
(iii) Professional and other members	
▶ One expert representing the fields of finance & accounts/ law/management, ▶ One representative of small scale tool producers, ▶ One representative of OEM, ▶ One representative of major manufacturers in the region ▶ Representative of Technical University of the state which governs engineering colleges	▶ To be nominated by O/o DC-MSME ▶ To be decided by O/o DC-MSME
(iv) MD/Executive Director/GM/PD of the Society	
On his appointment, the Executive Director or General Manager of the Society shall automatically become ex-officio member of the Governing Council during the tenure of his office, as *Member Secretary.*	

▶ Role of the governing council

The Governing Council will discharge such duties and responsibilities, exercise such powers and undertake and carry out such activities as considers essential with a view to attain the aims and objectives as per the Memorandum of Association of the Society, with particular reference to the following;

- To prepare and execute plans and programmes for the establishment of the TC based on the plan of operation and to carry on its administration and management after such establishment.
- To prepare, consider and approve the policies and strategies of the Society and to reconsider and amend the said policies and strategies whenever appropriate.
- To receive grants and contributions and to have custody of the funds of the society.
- To prepare, consider and approve the budget estimates of the society every year.
- To prepare and maintain accounts and other relevant records and annual statement of accounts including the balance sheet of the society.
- To open, conduct and prescribe courses of study, training and research in tool management and allied subjects.
- To fix and receive such fees and other charges from persons undergoing training as may be necessary.
- To prescribe rules and regulation for the admission of candidates to the various courses of training.
- To lay down standards of proficiency to be demonstrated before the award of diplomas, certificates and other distinctions to the trainees.
- To institute and award scholarships, prizes and medals.
- To provide for and supervise the residence, health, discipline and the well-being of the trainees in the Society.
- To create subject to the provisions of Rule 68 supra technical, training, research, administrative, ministerial and other posts under the Society and to make appointments thereto on such terms and conditions as deemed appropriate.
- To co-operate with any other organisation in the matters of education, training, management and allied subjects.
- To enter into arrangements for and on behalf of the society.
- To sue and defend all legal proceedings on behalf of the Society.
- To appoint committee or committees for the disposal of any business of the Society or for advice in any matter pertaining to the Society.
- To delegate to such extent it may deem necessary any of its power to any officer or committee of the Governing Council.
- To consider and pass such resolution on the Annual Report, the annual accounts and the financial estimates of the Society as it thinks fit.
- To make, inform, adopt, amend, vary or rescind from time to time rules and by-laws for the regulation of and for any purpose connected with the management and administration of affairs of the Society and for the furtherance of its aims and objectives.
- To make, adopt, amend, vary or rescind from time to time rules and by-laws for
    - For the conduct of the business of the Governing Council and the committee(s) to be appointed by it,

  - For delegation of its powers,
  - For fixing quorum.
- To sell, lease, mortgage or exchange and otherwise transfer all or any portion of the properties of the Society.
- To establish a provident fund for the benefit of the employees of the Society.
- To perform such additional functions and to carry out such duties as may from time to time be assigned to it by the Society.
- To establish procedure in respect of services and technical advice to be rendered to the industry by the Society and the levy and collection of charges for the same.
- To delegate its powers as may be deemed fit and appropriate but not the powers for:
  - Altering, extending or abridging the purposes of the TC within the meaning of the Societies Registration Act, 1860.
  - Amalgamating the TC either wholly or partially with any other TC having similar aims and objectives.
  - Altering, extending or abridging the Rules and Regulations of the TC within the meaning of the Societies Registration Act, 1860.
  - Shifting the existing location or altering the capacity of the TC.
  - Making capital investment exceeding the approved budget.
  - Borrowing money except for working capital exceeding the approved budget.
  - Transferring by way of mortgage, pledge, hypothecation or otherwise any assets, moveable or immovable, except as security for working capital.
  - Appointing bankers and auditors.
  - Generally anything extraordinary and of major importance.

► Roles and responsibilities of the member secretary (GM/PD/MD)

- Plan, direct, co-ordinate, organize and supervise day-to-day work of the society.
- Implement policies, strategies and such programs of the society and attend to all statutory requirements imposed thereon.
- Prescribe the functions, duties and responsibilities for all officers and staff of the society, give them appropriate instructions and exercise such supervision and disciplinary control as may be necessary.

► Roles and responsibilities of the O/o DC-MSME in management of the TCs

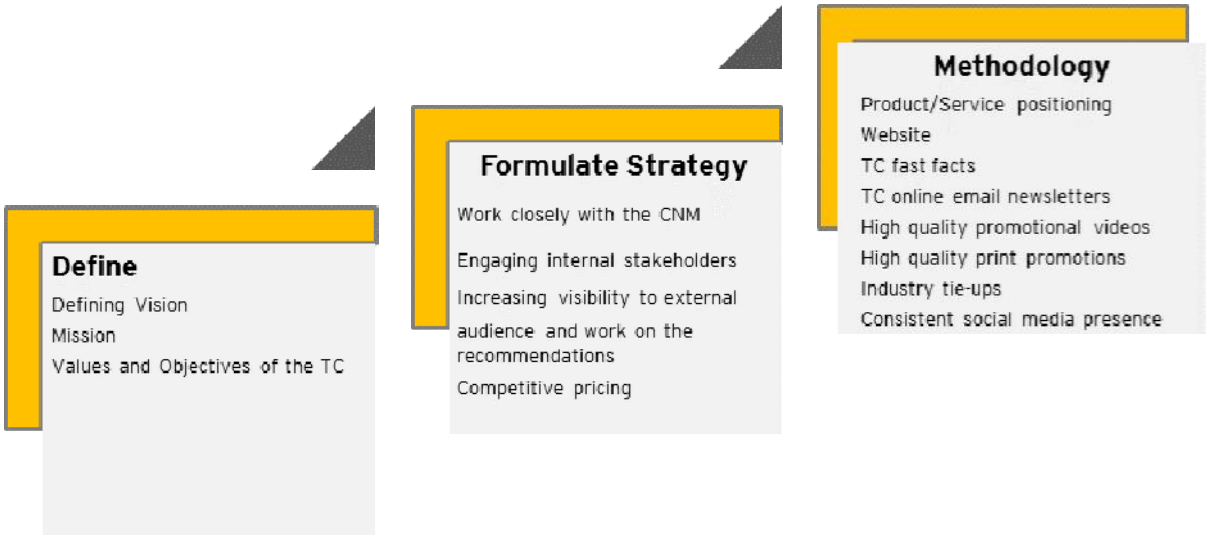
- Support DC-MSME in executing the responsibilities as the Chairman of the Governing Council of all TCs.
- Support in implementation of strategic projects and policies from the central to the TC levels.
- Act as the nodal point of coordination between the TCs and the DC-MSME.

Marketing Plan

8. Marketing plan of Baddi TC

The marketing plan of Baddi TC would require specific actions to engage with potential customers and clients in the catchment area. A series of activities is therefore required to be planned for effective marketing of Baddi TC to promote its business, product or services. A broad suggestive framework for marketing of Baddi TC would include the following;

Figure 16: Suggestive framework for marketing of TC



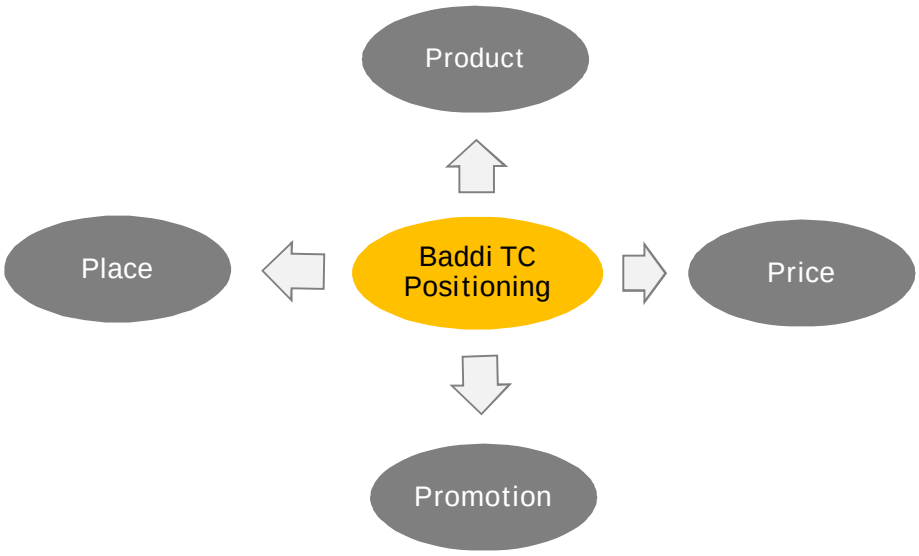
In line with the above suggestive framework, a detailed Go to Market plan of the proposed TC will be prepared subsequently by the Cluster Network Manager (CNM) along with the GM and marketing team of the TC. The role of CNM for marketing would be very crucial and will act as an additional arm of the marketing wing of the proposed TC. It will further strengthen its market linkages with the MSMEs in the cluster it serves. CNM will also market the TC within the trade and industry associations, academia, educational institutions, applied research institutions, service providers, other government support institutions, workers and skill seekers.

As part of the marketing initiative, CNM would work closely with MSME clusters in the region to understand their needs and requirements and involve OEMs/ tier 1 players in the region. Based on the observations, the marketing strategy of the TC would be customized targeting various focus groups including technical and training institutes. Further, the CNM would be part of the consolidation of the results and recommendations of the diagnostic into a strategic plan for cluster development. The CNM would also represent the TC in various industry oriented outreach programmes and workshops. This would help in two ways; promoting the TC and understanding industry perspective and future areas of focus. The same will help to identify key areas of focus for the TC and align the future marketing strategies accordingly.

Hence, the CNM would promote the TCs in among the newly developed partnerships for mutual benefit around identified programmes / initiatives.

The plan should clearly position the proposed TC's marketing mix with respect to its four Ps - product, price, place and promotion. The suggestive points which needs to be taken care while designing the Go To Market Plan for the Baddi TC has been highlighted below:

Figure 17: Positioning of marketing mix for proposed TC



Product
A General Engineering TC is proposed to be developed at Baddi based on the presence of large engineering focused units (in automobiles, steel, cement, FMCG etc.), analysis of the industry and market. The product and service offering of the proposed TC therefore has been carefully derived keeping in view the existing gaps to address specific requirements of this sector. Further the shortlisted specialisations and respective courses to be offered by the proposed TC have been done keeping in view the shortage in the availability of required skill sets in the labour force across the industry. The centre would encourage final year trainees to start their own ventures by providing necessary support like finance, high end machining, availing benefits of Government schemes etc. for a period of 3 years. The summary is provided below: The key offerings of the proposed TC will be; manufacturing of tools, training for skill development with respect to various specialisations, consultancy services in general engineering. Focus areas would include:

- Manufacturing of moulds, die, jigs and fixtures etc. for general engineering
- Long and short term training programmes in CNC/ CAD/CAM, advance welding, industrial and process automation etc.
- Consultancy services in the field of product and tool design, manufacturing etc. for improved quality and productivity.
- Incubation support to the trainees/budding entrepreneurs for their start-up ventures

Price

As per the study and discussions with GMs of some of the existing TCs, the proposed TC should adopt the cost plus pricing approach for its products and services during its initial years of operation and thus ensuring operating profit for sustainability. Most of the existing MSME TCs follow the cost plus pricing approach only for all of their products and services

As a differentiator from the existing MSME TCs, it is proposed that once the TC will strengthen its brand and credibility in the market it should gradually move towards market-based pricing with defined margin levels (margin based costing). Then, the TC will have to work towards optimisation of its processes and operations to sustain its margins in the competitive environment.

The above mentioned pricing models are suggestive and will depend on the detailed analysis while preparing the Go To Market Plan with the support of the CNM

Promotion

Promotion of TCs products and services is one of the most important components of the Go To Market Plan for a new set-up. Hence, below are some of the suggestive points which might be considered while making the final Go To Market Plan for the proposed Baddi TC.

- Increasing visibility to external audience
  - Encourage and execute early communication and promotion of activities by TC which are relevant to key external audiences including industry, media, technical media etc.
  - Producing a steady, reliable stream of quality outbound communications that highlights;
    - Research innovations and technology evaluations coming from the TC and its partnerships.
    - Special events and conferences hosted or supported by TC.
  - Working with industry partners to identify projects for joint publicity.
  - Develop Facebook/ LinkedIn/ Twitter/ YouTube presence to connect to students.
  - Ensure current marketing message is being maintained with all social media platforms administered by these TC.
- Engaging internal stakeholders
  - Conduct media and website training on a regular basis for all interested faculty and staff.

- Leverage active partnerships with the industry and community, inviting departmental and staff participation.
- Ensure department faculty and staff are informed of the progress of the TC with respect to each goal.

- Other Activities
  - Website: Develop a website showcasing all highlights of the TC.
  - TC fast facts: Fast fact can be a two-page information sheets describing the highlights of TC. It can be made available online and increase the visibility to external audiences.
  - TC online email newsletters: Preparation and delivery of high-quality email newsletters from TC to industrial units, associations and other partners with the latest research announcements, news and more of engaging and interesting information to these external audiences.
  - High quality print promotions: High quality print promotions coordinated by TC communications, which maintains the Baddi TC as a brand to be utilised in outreach efforts.
  - Industry tie-ups: Partner with Industries and other technical education institutes to increase the visibility of TC. Explore opportunities to participate in publications and other co-branding opportunities with these partners from time to time.
  - Maintain consistent social media presence: Ensuring consistent, exciting messaging is posted on active social media platforms including the TCs Facebook page, Twitter account, YouTube channel and others. Promote the presence of TC on these platforms to students, alumni and supporters while acting as a social media hub for internal departments

Place
Baddi is strategically located near Punjab and Haryana with several large industrial units in Automobiles, FMCG manufacturers, Pharmaceuticals, Steel, Cement, and other engineering industries in the region. Further, the Himachal Pradesh Government is projecting the potentiality of the state to rope in major industrial groups to invest in the state and improve the overall industrial picture.

As a part of developing the go to market plan GM would work with the CNM, during the final stages of the construction, to prepare a detailed marketing plan keeping in view the focus areas of the TC. This team, with support from CNM, would be responsible to conduct the suggestive activities as mentioned in the promotion component and lead the marketing initiative for the TC.

In view of the above broad framework the following would be undertaken for marketing of the TC during its inception to start with. It is proposed to keep aside an initial one time marketing budget for completing most of the below mentioned activities through third party vendors:

Table 23: Suggestive marketing activities, ownership and timeline

Phases	Activity	Ownership	Timeline
Preparation of promotional materials	• Designing brochure of TC (through outsourcing) • Short video film of TC infrastructure and facilities available (through outsourcing- post completion of the infrastructure/construction) • Development of TC website (through outsourcing)	Marketing team, GM and CNM	Construction and Post construction phase
Pre marketing activities	• Preparing list of industrial association bodies in the Baddi catchment, district and state. • Preparing list of industries in consultation with DIC. • Shortlisting of perspective players' with respect to product range and process. • Design a brief questionnaire. • Preparing list of engineering colleges, ITIs, polytechnics, in the catchment area.	CNM and GM	Construction phase
Targeting the manufacturing units	• Send the brochure along with cover letter and short questionnaire to the shortlisted industries. • Seek time from large industries and industry body associations to give presentation on the capability statement of Baddi TC with respect to manufacturing of tools etc. • Send representatives to get the filled questionnaire or fill the questionnaire circulated earlier. • Analyse the questionnaires received with respect to production, consultancy, training requirements of industries. • Meeting the key industrial units identified in the analysis to further understand their needs with respect to tool manufacturing, production support, training of employees etc. • Organise as well as participate in industry oriented outreach programmes/ seminars/ workshops/ boot camps etc.	GM, Manager Marketing, CNM and TP	During installation and commissioning of machines for manufacturing
Targeting OEMS	OEMs are important because they involve many industries including MSMEs in the manufacturing of a product. The TC will plan for targeting the	GM, Manager Marketing,	During installation and commissioning

Phases	Activity	Ownership	Timeline
	same through the following; • Take appointment and meet the OEMs in the region to understand their specific needs with respect to support required in tool manufacturing and training of employees etc. • Presentation on the capability statement of the TC with respect to manufacturing of tools, training etc. • Get their vendor details and understand their portfolio of product requirement at various levels • Plan to Increase product portfolio to cater to the OEMs and their vendors	CNM and TP	
Targeting technical and vocational training institutes and high schools	• Meet the principle/ HoD of the institutes and present on the capability statement of Baddi TC with respect to training infrastructure, faculty, real time learning with on job learning etc. • Seeking permission and presenting the same to final and pre final year students • Getting permission to display the brochure of TC on the notice board of these institutes. • Organise as well as participate in industry oriented outreach programmes/ seminars/ workshops/ boot camps etc.	Marketing team (GM) and CNM	During installation and commissioning of machines for training

Focus Area for the TC

9. Focus area for Baddi TC

The proposed TC in Baddi will be focused on General Engineering with facilities such as; production, training and consultancy services. The details of these facilities are explained below.

9.1. Production

On the basis of focus sector for the proposed TC, following are the machines identified for production/ manufacturing activities at the proposed TC. The list will be further validated by technology partner for finalisation and to initiate procurement. The budgetary cost (landed cost) of these machines is approximately estimated at around INR 24.11 Cr. Chemical and Metallurgy Labs are also proposed for testing and calibration. Packaging industry serving to FMCG and pharmaceuticals will be the key user of the testing lab. The growing concerns related to climate change, energy security, scarcity of natural resources and increasing environmental regulations is putting more emphasis on sustainable production activities in manufacturing process. Due care therefore has been taken during the identification of machines for production systems and associated services, processes, plants and equipment in the TC. This will make the TC environmental friendly and energy efficient and would be better equipped to manufacture more products with less material, energy and waste.

Table 24: Proposed list of machines for production/ manufacturing activities

S. N.	Machine	Size	Number	Value (lacs)	Total Cost
1	CNC Milling-5axis	0.6mxo.5mx0.5m	1	125	125
2	CNC VMC-3axis	1.6mx0.9mx0.9m	1	150	150
3	CNC VMC-3 axis	0.8mx0.6mx0.5m	4	75	300
4	CNC Lathe	Dia 250x600mm	1	35	35
5	Conventional Milling	1.2mx0.5mx0.4 m	2	25	50
6	Conventional Lathe	Dia400x1200mm	2	20	40
7	Wire EDM	500x500x400 mm	2	100	200
8	EDM Die Sinking	500x500 mm	2	75	150
9	Radial drill machine	63mm	1	10	10
	Surface Grinding Large	1000x600 mm	1	50	50

10					
11	Surface Grinding	600x300 mm	2	30	60
12	Cyl Grinding	Dia 200x750mm	1	40	40
13	Tools & Tooling Systems	10%			121
14	Hydraulic press	100 T	1	50	50
15	Mechanical press	63 T	1	40	40
16	Injection Moulding machine	200 T	1	50	50
17	Work Benches with Bench Vices & Assembly Kits		10	1	10
18	Auxiliary Eqpts (Drill m/c, Bench grinder, Surface Plates etc.)		1 lot	20	20
19	Matl. Handling Eqpt.- EoT crane 5T (1 No.), Jib Crane 2T (2 nos.), Trollies		1+2	50	50
20	CNC Coordinate Measuring Machine	1600mmx900 mm	1	200	200
21	Metrology Lab Eqpt.		1 lot	100	100
22	Chemical and Metallurgical Test labs			200	200
23	Vacuum HT Plant, Aux. Eqpt & Metallurgy Testing Lab	Dia. 600x800 mm	1 lot	200	200
24	CAD-CAM Software CATIA,UG etc. and Analysis Software		10 Seats	3	30
25	Scanning/Drafting/Printing		1	5	5
26	CAD-CAM Workstations		10	1	10
27	Misc and Contingency		5%		115
	Total Production Machines & Equipt.				2,411

9.2. Training

The TC at Baddi will provide professional training in various courses with focus on general engineering. The TC will be able to produce highly skilled technical workforce, with greater career prospects in the General engineering industry. The duration of courses will be both short and long term, ranging from 1 month to 48 months in various specialisations like; Tool Room & CNC Manufacturing, CAD/ CAM, Advance Welding , Electronics and IT, Industrial and process Automation, Training on Testing, etc. The batch size, number of batches per annum and respective fee have been decided on the basis of capacity of existing TCs and NCVT norms. A soft skill lab having for training in English language and communication facilities will be established in the TC to cater to the various courses. Soft skill module will be an integral part of all the medium to short term courses. The TC will start training activity from the first year of its operation across all specialisations. The total capacity intake is expected to reach approximately 9,500 trainees over 5 years. The detail of courses in various specialisations is given below:

Table 25: Details of specialisation, courses, duration and capacity intake

No.	Specialization	Course name	Duration (months)	Batch size	No. of Batch/ year	Annual intake
1	Tool Room & CNC Manufacturing, CAD/ CAM	Advanced Diploma in Tool & Die making	48	60	1	60
		Certificate course in Machinist	24	30	1	30
		PG in Tool Design & CAD CAM	18	30	2	60
		Post Diploma in Tool and Die Manufacturing	12	30	2	60
		Post Diploma in CNC-Prog & Op	12	30	2	60
		Post Diploma CAE (manufacturing)	12	30	2	60
		Adv. Certificate Course in Tool Design & CAD/CAM	12	30	2	60
		Adv. Certificate Course Tool & Die Manufacturing	12	30	2	60
		Certificate Course in Tool & Die Making	12	20	2	40
		Master of CAD/CAM/CNC	6	30	6	180

No.	Specialization	Course name	Duration (months)	Batch size	No. of Batch/ year	Annual intake
2	Maintenance	Machine Maintenance-mech	3	20	4	80
		Certificate Course in Machine Maintenance	12	30	4	120
		Maint. Technician	3	20	4	80
		Machine Maintenance-mech (Part Time)	6	20	2	40
		Maint Technician (Part Time)	6	20	2	40
3	CNC Manufacturing,CAD/ CAM	Adv. Certificate Course CNC Machining (L,M,WC,EDM)	12	30	2	60
		Certificate Course CNC Machining (Turn & Milling)	12	20	2	40
		Certificate Course in Metrology & QC	12	30	4	120
		Master Certificate Course in Computer Aided Tool Engineering	6	30	6	180
		CNC lathe programming and operation (Full Time)	2	30	12	360
		CNC lathe programming and operation (Part Time)	4	30	12	360
		CNC Milling Prog and Operation (Full Time)	2	30	12	360
		CNC Milling Prog and Operation (Part Time)	4	30	12	360
		CAD/CAM/CNC Programming (Full Time)	2	30	12	360
		CAD/CAM/CNC Programming (Part Time)	4	30	6	180
		CAD Modelling with different softwares (Full Time)	1	30	24	720
		CAD Modelling with different softwares (Part Time)	2	30	24	720

No.	Specialization	Course name	Duration (months)	Batch size	No. of Batch/ year	Annual intake
		Computer Integrated Manufacturing (CIM)	1	30	24	720
4	Advance Welding	Basic Arc and Gas welding (Full Time)	3	20	4	20
		Basic Arc and Gas welding (Part Time)	6	20	4	80
		TIG welding (Full Time)	1.5	10	4	10
		TIG welding (Part Time)	3	10	8	60
		MiG welding (Full Time)	1.5	10	8	10
		MiG welding (Part Time)	3	10	8	60
		6 G Pipe Welding (Full Time)	2	10	8	80
		6 G Pipe Welding (Part Time)	3	10	8	80
		Spot Welding (Full Time)	1.5	10	2	10
		Spot Welding (Part Time)	3	10	4	10
		Stainless Steel & Alluminium welding (Full Time)	1.5	10	2	10
		Stainless Steel & Alluminium welding (Part Time)	3	10	4	10
		Welding-NCVT	12	20	1	20
6	Electronics and IT	Basic computer and Hardware (Part Time - 4 hrs)	2	20	20	400
		Advanced Hardware & Networking (Part Time - 4 hrs)	4	20	10	200
		Solar energy system technician	3	12	4	48
		Power plant instrument mechanic	3	12	4	48
	Industrial and	Industrial Hydraulics	1	20	12	240

No.	Specialization	Course name	Duration (months)	Batch size	No. of Batch/ year	Annual intake
7	process Automation	Industrial pneumatics	1	20	12	240
		PLC Programming	1	20	12	240
		Automation Technician	4	20	3	60
		Industrial automation design	4	20	3	60
		Post Diploma in Mechatronics	12	30	2	60
		Diploma in Mechatronics	36	30	1	30
8	Training on Testing	Chemical testing: Analysis of Metal and Non Metal, Coal, Cement etc.	4	20	12	240
		Mechanical: Physical Properties of metal and Non Metal product/material	4	20	12	240
		Metallurgical Testing	4	20	12	240
		Electrical	4	20	12	240
						7,886

Table 26: Details of courses

No.	Specialization	Course Name	Fee / Student (INR)	Annual Intake	Minimum Qualification	Classrooms		Laboratories		Workshops	
						Number	Area	Number	Area	Number	Area
1.	Tool Room & CNC Manufacturing, CAD // CAM	Advanced Diploma in Tool & Die making	1,40,000	60	10th pass	4	300	3	162	1	756
		Certificate course in Machinist	40,000	30	10th pass	2	150				
		PG in Tool Design & CAD CAM	105000	60	Degree			1	54		
		Post Diploma in Tool and Die Manufacturing	50000	60	Dip/Degree			1	54		
		Post Diploma in CNC-Prog & Op	25000	60	Dip/Deg			1	54		
		Post Diploma CAE (manufacturing)	60000	60	Dip.						
		Adv. Certificate Course in Tool Design & CAD/CAM	60000	60	ITI/Diploma						
		Adv. Certificate Course Tool & Die Manufacturing	60000	60	ITI/Diploma						
		Certificate Course in Tool & Die Making	40000	40	ITI						
		Master of CAD/CAM/CNC	20000	180	Degree/Diploma			1	54		
		Certificate Course in Machine Maintenance	30000	120	ITI						
		Machine Maintenance-mech		80	Diploma			1	54		
		Maint Technician	10000	80	ITI-FIT/TUR/Mac			1	54		

No.	Specialization	Course Name	Fee / Student (INR)	Annual Intake	Minimum Qualification	Classrooms		Laboratories		Workshops	
						Number	Area	Number	Area	Number	Area
					h						
		Machine Maintenance-mech (Part Time)	18000	40	Diploma						
		Maint Technician (Part Time)	12000	40	ITI-FIT/TUR/Mach						
		Adv. Certificate Course CNC Machining (L,M,WC,EDM)	60000	60	ITI/Diploma						
		Certificate Course CNC Machining (Turn & Milling)	40000	40	ITI/Diploma						
		Certificate Course in Metrology & QC	30000	120	ITI						
		Master Certificate Course in Computer Aided Tool Engineering	40000	180	ITI						
		CNC lathe programming and operation (Full Time)	9000	360	ITI	1	75	2	108	1	756
		CNC lathe programming and operation (Part Time)	10000	360	Pursuing ITI/Industrial workers						
		CNC Milling Prog and Operation (Full Time)	10000	360	ITI			2	108		
		CNC Milling Prog and Operation (Part Time)	10000	360	Pursuing ITI/Industrial						

No.	Specialization	Course Name	Fee / Student (INR)	Annual Intake	Minimum Qualification	Classrooms		Laboratories		Workshops	
						Number	Area	Number	Area	Number	Area
					workers						
		CAD/CAM/CNC ENGINEER (Full Time)	10000	360	DIP/Deg			2	108		
		CAD/CAM/CNC ENGINEER (Part Time)	12000	180	Pursuing DIP/Degree/ Working						
		CAD Modelling with different softwares (Full Time)	6000	720	DIP/Deg			2	108		
		CAD Modelling with different softwares (Part Time)	7000	720	DIP/Deg						
		Computer Integrated Manufacturing (CIM)	7000	720	Deg						
2.	Advanced Welding	Basic Arc and Gas welding (Part Time)	12000	80	Pursuing ITI/Industrial workers						
		TIG welding (Full Time)	5000	40	ITI/Basic course						
		TIG welding (Part Time)	6000	80	Pursuing ITI/Industrial workers						
		MiG welding (Full Time)	5000	80	ITI/Basic course						
		MiG welding (Part Time)	6000	80	Pursuing						

No.	Specialization	Course Name	Fee / Student (INR)	Annual Intake	Minimum Qualification	Classrooms		Laboratories		Workshops	
						Number	Area	Number	Area	Number	Area
					ITI/Industrial workers						
		Basic Arc and Gas welding (Full Time)	10000	80	10th	1	75			1	756
		Basic Arc and Gas welding (Part Time)	12000	80	Pursuing ITI/Industrial workers						
		TIG welding (Full Time)	6000	40	ITI/Basic course						
		TIG welding (Part Time)	6000	80	Pursuing ITI/Industrial workers						
		MiG welding (Full Time)	6000	80	ITI/Basic course						
		MiG welding (Part Time)	6000	80	Pursuing ITI/Industrial workers						
		6 G Pipe Welding (Full Time)	6000	80	Pursuing ITI/Industrial workers						
		6 G Pipe Welding (Part Time)	6000	80	Pursuing ITI/Industrial workers						

No.	Specialization	Course Name	Fee / Student (INR)	Annual Intake	Minimum Qualification	Classrooms		Laboratories		Workshops	
						Number	Area	Number	Area	Number	Area
		Spot Welding (Full Time)	8000	20	ITI/Basic course						
		Spot Welding (Part Time)	8000	40	Pursuing ITI/Industrial workers						
		Stainless Steel & Aluminium welding (Full Time)	8000	20	ITI/Basic course						
		Stainless Steel & Aluminium welding (Part Time)	8000	40	Pursuing ITI/Industrial workers						
		Welding-NCVT	24000	20	10th						
3.	Electronics and IT	Basic computer and Hardware (4 hours per day)	8,000	480	10th/ITI/12th	1	75	2	108		
		Advanced Hardware & Networking (4 hours per day)	12,000	320	12th/DIP/Degree						
		Solar energy system technician	8,000	48	ITI Electrician/ Electronics			1	54		
		Power plant instrument mechanic	8,000	48	ITI Electrician/			1	54		

No.	Specialization	Course Name	Fee / Student (INR)	Annual Intake	Minimum Qualification	Classrooms		Laboratories		Workshops	
						Number	Area	Number	Area	Number	Area
					Electronics						
4.	Industrial and Process Automation	Industrial Hydraulics	6,000	120	ITI/Dip/Deg	1	75	1	54		
		Industrial pneumatics	6,000	240	ITI/Dip/Deg			1	54		
		PLC Programming	6,000	240	Dip/Deg			2	108		
		Automation Technician	12,000	240	ITI			1	54		
		Process automation design	15,000	60	Dip/Deg						
		Diploma in Mechatronics	1,20,000	180	10th	1	75	2	108		
		Post Diploma in Mechatronics	60000	60	Dip/Deg						
5.	Training on Testing	Chemical testing: Analysis of Paper,Metal and Non Metal, etc.	8000	240	ITI/Dip/Deg	1	75	1	54		
		Mechanical: Physical Properties of metal and Non Metal product/material	8000	240	ITI/Dip/Deg			1	54		
		Metallurgical Testing	8000	240	ITI/Dip/Deg			1	54		
		Electrical	5000	240	ITI/Dip/Deg						

The TC will have adequate installed capacity of infrastructure like machines, software, computers etc. required to provide training to the proposed student capacity under various specialisations. The estimated cost of these machines is approximately INR 22.10 Cr. The following table provides the details of the same;

Table 27: Proposed list of machines for training

S.No.	Training Machines	Nos	Value (lakhs)	Total
1	Conventional Milling-V-H-U	20	10	200
2	Conventional Lathe	20	5	100
3	Surface Grinding	10	5	50
4	Cylindrical grinding	5	10	50
5	Pedestal Grinding	10	1	10
6	Drilling Machines	15	1	15
7	Tool & Cutter Grinder	1	20	20
8	Work benches and Kits	30	0.5	15
9	CNC-Milling	15	30	450
10	CNC-Lathe	15	20	300
11	Tooling and Tooling Systems	@10%		120
12	CNC Milling & Lathe Simulation Modules	30	2	60
13	Computers for Computer Labs	400	0.5	125
14	CAD/CAM software Licence	200	0.5	100
15	CMM+ metrology lab equipment	1	75	75
16	Welding workshop	1	50	50
17	3-D Printing, Scanner etc	1	10	10
18	Automation Lab for 20	1 set	200	200
19	Teaching aids (Audio Visual)	20	1	20
20	Teaching aids (Smart Board)	10	1 lot	10
21	Furniture for labs	30	1 lot	30
22	IT Hardware & Networking labs (2 labs)	2	20	40
23	Classroom Furniture @ 60 seats	8	5	40
24	Solar Energy Lab	1	20	20
	Misc, Unforeseen & Contingency 5%			105
	Total			2,210

9.3. Consultancy

MSMEs are plagued with bottlenecks and inefficiencies that compromise their competitiveness and presence in the market. Handholding is required to enable MSMEs to develop competencies in the areas of product & process development, operation improvement, streamlining and standardisation of processes through adoption of international norms, new technologies and capacity enhancement. Quality and technical relevance of products need to be maintained by supporting product development, component manufacturing, precision engineering, process automation and adherence to quality norms.

Therefore, the Baddi TC would have a dedicated professional wing to assist MSMEs by providing consultancy services in the field of Design Support (incl. Product Design), Engineering Solutions (Development of Jigs & Fixtures for Machining, Welding etc., Quality System Support, Project Consultancy (curriculum development, community colleges, trainers etc.), Low cost Automation Solution support, Productivity Improvement. The support of TP will be taken wherever required. Consultancy will be provided in the following areas:

- Product development and engineering solutions
- Project consultancy in setting up of private TRs, training centre etc.
- Design support
- Quality systems support
- Productivity improvement through cluster approach
- Maintenance support to institutes like ITIs, polytechnics and specialised machines of MSMEs
- Curriculum development, Course material development and lesson plan to ITIs, Polytechnic, Community Colleges and other institutes
- Trainers training to ITI, Polytechnic and Community Colleges
- Lean manufacturing
- Designing of Automation solutions
- Seminars/Workshops for MSMEs, Colleges
- Support to Community College of central university
- Business incubation services
- Other consulting projects

Since providing consulting services requires the expertise in specific domain, the TC would hire the required resources to increase the in-house capability. Illustrative phasing of the areas/domains where the TC can provide consulting services has been suggested below. This has been designed keeping in mind the resource planning and future revenue projections as well.

The designing and consulting department will be equipped with high-end workstations, CAD/ CAM software, and analysis software. The design and consulting department is recommended to have 7 experts. The consulting team will also be supported by the production and training departments on need basis. In addition to the above, 30 trainees of final semester tool design course will also work

with design department in shifts on daily basis. It is also proposed to have tie-ups/ collaborations with other MSME TCs in specialised areas of project consultancy as and when needed. The table below represents the projected revenue estimates for 10 years, keeping in mind the impetus on the consulting services for the proposed TC. The revenue estimation has been done using the average machine hour rate.

Table 28: Areas of consulting and estimated revenue

S. No	Consulting Areas	Suggestive Rev Year 1	Suggestive Rev Year 2	Suggestive Rev Year 3	Suggestive Rev Year 4	Suggestive Rev Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
						50%	30%	30%	30%	30%	30%
1.	Design Support (incl. Product Design)	4,00,000	6,00,000	9,00,000	13,50,000	20,25,000	30,37,500	45,56,250	68,34,375	1,02,51,563	1,53,77,344
2.	Engineering Solutions (Development of Jigs & Fixtures for Machining, Welding, etc.)	1,00,000	1,50,000	2,25,000	3,37,500	5,06,250	7,59,375	11,39,063	17,08,594	25,62,891	38,44,336
3.	Quality System Support	1,00,000	1,50,000	2,25,000	3,37,500	5,06,250	7,59,375	11,39,063	17,08,594	25,62,891	38,44,336
4.	Project Consultancy (curriculum development, community colleges, trainers, etc.)		2,00,000	3,00,000	4,50,000	6,75,000	10,12,500	15,18,750	22,78,125	34,17,188	51,25,781
5.	Low cost Automation Solution Support		1,00,000	1,50,000	2,25,000	3,37,500	5,06,250	7,59,375	11,39,063	17,08,594	25,62,891
6.	Productivity Improvement		1,00,000	1,50,000	2,25,000	3,37,500	5,06,250	7,59,375	11,39,063	17,08,594	25,62,891
Total		6,00,000	13,00,000	19,50,000	29,25,000	43,87,500	65,81,250	98,71,875	1,48,07,813	2,22,11,198	3,33,17,578

*The suggestive revenue from design support during 2017-18 has been estimated on the basis of usage of CAD Software like CATIA, UG etc. The TC is provisioned to have 10 numbers of such software packages which with an average estimated rate/hour of INR 200. So with installed capacity @ 80%, the revenue from this stream during one shift of operation is estimated to be around 10*8*80%*200 = INR 12,800. Assuming 25% capacity utilisation for 300 days during 2nd year (2017-18), the total estimated revenue from CAD Software like CATIA, UG packages is INR 9.6 lakhs. Similarly, revenue assumptions from other engineering analysis software like ANSYS, Mouldflow, Autoform, etc. has been estimated to be around INR 48,000. Hence, the total estimated revenue from design support is around INR 10.08 lakhs for year 2017-18.

Table 29: Proposed areas of consulting

Consulting Stream	Focus Area (Recommended)
Design Support (incl. Product Design)	▶ Tool design in the field of sheet metal, press tool and plastic moulds. ▶ Support MSMEs in designing products to be supplied to OEMs. This will require 3D modelling and may include reverse engineering etc.
Engineering Solutions (Development of Jigs & Fixtures for Machining, Welding etc	▶ Designing the machining processes involving jigs and fixtures design, cutting tool selection, machine selection, cycle time and tack time selection and achieving the final shape and quality
Quality System Support	▶ Supporting MSMEs in establishing quality systems, quality improvement and acquiring necessary certifications
Project Consultancy (curriculum develop, community colleges, trainers etc.)	▶ Supporting training institutes in curriculum develop, community colleges, trainers etc. ▶ This may also involve setting up of Tool Rooms and vocational training centres on turnkey basis for various companies under CSR initiatives and for Government
Productivity Club	▶ To handhold MSMEs in improving productivity on a long term basis (1-3 years) on a membership basis
Low cost Automation Solution support	▶ Solutions to automate process for increasing efficiency at various stages of manufacturing

Based on the focus areas recommended above, revenue estimation has been done for the identified consulting streams. These estimations are purely based on the expert judgement, prevailing market rates and discussions with the existing TRs.

Table 30: Estimated revenue from consulting

Consulting Stream	Approximated Revenue Estimation
Design Support (incl. Product Design)	▶ Revenue estimation from CAD Software like CATIA, UG etc. - 10 Nos. and hourly rate of Rs 200. This is initially estimated to run in 1

Consulting Stream	Approximated Revenue Estimation
	shift (8 hrs.) at 25% capacity. The installed capacity assumed to be 80% running for 300 days a year. Therefore the calculation would be, 25%*[(10*200*8*300)*80%] = INR 9,60,000 per year ► Revenue from other Engg. Analysis software like ANSYS, mouldflow, autoform etc. estimated to be INR 48,000
Engineering Solutions	Rate of INR 250/hr with an estimation of minimum requirement 100 hours per product. We have estimated initially at least 2 products per month. Therefore, 2*250*100 = INR 50,000/month (50,000*12=6,00,000/year)
Quality System Support	Estimated rate of INR 50,000 per unit. We have estimated serving atleast 1 unit a month initially. Therefore, 50,000*12 = INR 6,00,000/year
Project Consultancy (curriculum develop, community colleges, trainers etc.)	Revenues from these assignments vary significantly depending upon the nature of the assignment. We have estimated a range of INR 1-4 lacs per assignment with 5-6 assignment per year
Productivity Club	To start with, fee of INR 20,000 per from 30 units per year. Therefore, 30*20,000 = INR 3,00,000
Low cost Automation Solution support	To start with, fee of INR 1,00,000 per from 5 units per year. Therefore, 5*1,00,000 = INR 5,00,000

9.4. Proposed support system to enable private TRs tap the market

A collaborative approach with private TRs can help to augment capacity to support MSME.

- Productivity and Quality club: To form a productivity and Quality Club where engineering units in a cluster under MSME may join the club on a reasonable annual fee. The value to the MSMEs would be as follows; MSME TC needs to earmark one expert (with support from TP if required) for the cluster for a period of 12 months with minimum 12 assured visits. The expert would mentor the MSME units individually towards improvement of their system and process to increase the productivity of the unit and quality of its product. These members may also enjoy preferential treatment in other services of the Tool Room e.g. designing and testing, CAD/ CAM etc. The club will facilitate for;
  - Partnerships and collaborations:
    - Develop better partnerships with corporations located in the state and in the catchment.
    - Collaborations with academic and applied research institutes to commercialise new technology/ innovations.
  - Facility Sharing: Sharing the Tool Room facility like high end design, analysis, intricate machining etc.
  - New Market: Jointly exploring potential new markets/ programs and execution the same.
  - Innovation: Promote emerging technological and knowledge-based innovative through seminars and clinics.

- Partnering with small tool rooms and MSMEs to make them competitive: The objective of the same is to carry out activities with potential to develop competitive advantage over time. Rather than two or more Tool Rooms in the catchment producing similar kind of products, a group of Tool Rooms can specialise in selected jobs which would further improve the focus on factors such as quality, costs and time.

Case Study – Consortium with MSMEs - CTTC Bhubaneswar

In 2013, CTTC Bhubaneswar has formed a consortium with 15 MSMEs from different industries in Odisha.

Objective

To obtain jobs/ work orders from customers for the consortium. These jobs, once received will be executed by different members of the consortium according to their capabilities and capacity. The majority of the work will be performed by the consortium members. In the initial period, CTTC will

support the MSMEs to undertake final machining and inspection for the products.

Over the period, as MSMEs equip themselves and develop in-house capabilities to independently execute the jobs, CTTC's support will reduce. Further, the number of MSMEs in the consortium is expected to increase, which would in turn strengthen the existing consortium and its capability to pitch for more specialised jobs.

CTTC has jointly pitched for jobs for consortium with its clients like

- Ordnance factory, Balangir
- HAL Koraput

Key Benefits

- As part of the consortium, the MSMEs can pitch for bigger and long term jobs and plan their investments in a better way. This will in turn encourage formation of new MSMEs and strengthening of existing MSMEs in Odisha
- Currently for some of the jobs, CTTC has to reach out to MSMEs outside Odisha. Over the period as MSMEs in Odisha get better equipped, these jobs can be performed by them.
- Gradually CTTC will move up the technology curve and would provide support mainly for higher end technologies and so on.

9.5. Technology collaboration

The TC at Baddi will venture into multiple new areas and to facilitate technology transfer and improve market linkages, role of TP and a CNM has been planned under TCSP.

- The TP will help identify and define globally competitive technological capabilities required in the cluster and assist proposed TC in building this capability through planning and handholding over a period of six years. The Technology Partner (TP) is required to enhance the capability and service offerings of TCs such that they transform to become models of manufacturing excellence for MSME. They need to become a trusted partner for MSMEs to learn how to attain manufacturing excellence and attain associated excellence in skills development. The services of the TCs include being exposed to the potential impact of new and relevant technologies, trainings on use of technologies/equipment, providing access to cutting-edge equipment, developing and testing new products and patenting. The key objectives of the TP include:

    - In conjunction with all stakeholders of the TCSP identify and define the globally competitive technological capability required by TCs, assist in their execution and provide handholding during their roll out.
    - Supporting the up gradation of the existing TCs and establishment of new TCs for the manufacturing sector
    - Augment services being offered by the TCs with respect to identified technologies and clusters with respect to training, production assistance (including optimization of equipment utilization) and technical advisory, resulting in increase in revenues of TCs focused at the manufacturing sector
    - Support TCs to increase productivity and competitiveness of general engineering focused MSMEs by
        - Exposing them to existing and expected future technologies
        - Develop skills of the workers and students in the identified technologies and clusters
        - Offering advice/recommendations to MSMEs (clients) who directly or indirectly supply to large players or component manufacturers.

    All investment decisions (technological & other) and work prioritization in TCs must be intrinsically connected with the market place and efficiently translate market needs to products and services that (satisfy these needs), & will be enabled by technology and enriched by global knowledge & expertise of the various stakeholders including the TP, empowered by global networks and people.

- The CNM will be appointed for a period of six years to facilitate cluster and market development to realise improved competitiveness. The CNM will work closely with the MSME clusters to understand their needs and requirements and get OEMs/ buyers involved in the program. The CNM will strengthen market linkages of TC with the MSMEs in the cluster it serves, trade and industry associations, academia, educational institutions, applied research institutions, service providers, other government support institutions, workers and skill seekers. Existing research institutions which could be potential collaborators for specific technologies etc. The CNM would work towards the following key objectives:

    - Increase of business opportunity for MSMEs through new market linkages.
    - Increase competitiveness of supply chains of large firms by enhancing the quality, reliability and productivity of MSME suppliers.
    - Increase the number of MSMEs utilizing the services of TCs resulting in increase in revenues of TCs
    - Enhance competitiveness of the cluster business environment:
        - Increase access by MSMEs to a network of business development services (BDS) which address needs not in the domain of TC expertise
        - Increase access by MSMEs to network of financial service providers
        - Increase awareness of opportunities in the public sector to contribute to a more competitive business environment.
    - Establish closer cooperation of key innovation stakeholders to enhance product and process innovation. This would include linking the research agendas of applied research and education institutes/organizations to industry and market requirements and promoting joint research and development projects.
    - Facilitate closer cooperation amongst skills development and labor market stakeholders to increase the number of workers/ trainees from TCs finding long term employment to improve their livelihood.
    - Establish a business model which ensures financial self-sustainability of the CNM as before the end of the TCSP funding window.

    All investment decisions (technological and other) and work prioritization in TCs must be intrinsically connected with the market place and efficiently translate market needs to products and services that (satisfy these needs), and will be enabled by technology and enriched by global knowledge and expertise of the various stakeholders including the CNM, empowered by global networks and people.

9.6. Entrepreneur Development Cell

Promoting emerging technological and knowledge-based innovative ventures that seek to nurture ideas from entrepreneurs is important for development MSMEs. Such entrepreneurial ideas not only provide a career option for students but also have a multiplier effect on employment generation. In order to encourage more and more students to become entrepreneurs, it is necessary to create awareness, motivate, educate and support the students. The development of an entrepreneur includes inculcating the entrepreneurial skills into a common person, providing the needed knowledge, developing the technical, financial, marketing and managerial skills, and building the entrepreneurial attitude among the applicants.

The Objective of EDC is to

- Act as an institutional mechanism for providing various services including information on all aspect of enterprise building to budding MSME entrepreneurs
- Create Entrepreneurial culture in the Institution and other institutions in the region and to promote entrepreneurship programmes related to women and weaker sections of the society
- Train the entrepreneurs in management of manpower, machine, material, taxes, legal aspects, finances and cash flow of a MSME
- Foster better linkages between the Parent Institution, Industries and R&D institutions in the region and other related organisations engaged in promoting Small & Medium Enterprises (SMEs) and Non-Government Organisations (NGOs).
- Catalyse and promote development of enterprises and promote employment opportunities in the innovative areas
- Respond effectively to the emerging challenges and opportunities both at national and international level relating to SMEs and micro enterprises

9.6.1. Entrepreneur Development Cell at Baddi TC

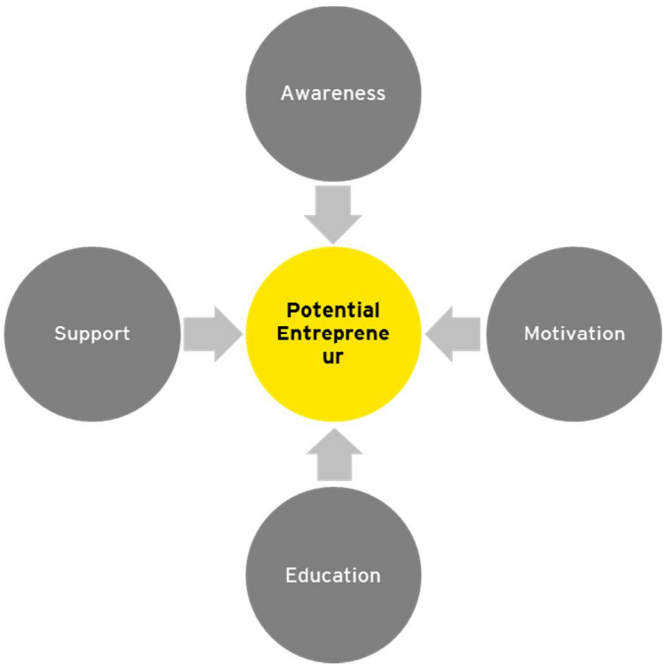
Entrepreneur cell at the TC shall consist of student and faculty (in house and visiting), adapt a systematic approach to guide students to become a leader to take global challenges and opt for self-employment. Following activities shall be taken up by the entrepreneur cell to accomplish its vision.

- Sensitize students on entrepreneurship at induction stage & orientation to the students.
- Conduct awareness programmes in house
- Enhancing industry institute interaction through guest lectures and industry visits
- Conduct programmes on idea generation & business plan preparation

- Conduct training programmes In the field of entrepreneurial skill development
- Market assessment for the entrepreneur opportunities
- Provide guidance and facilities to first time entrepreneurs particularly in raising funds and firm registration
- Support for entrepreneurship in curricula at diploma and degree levels

Collaborate with various institutes such as Entrepreneur Development Institute of India, Ahmedabad, and Entrepreneur Development Institutions (National Institute for MSME Hyderabad, Indian Institute for Entrepreneur (IIE) Guwahati, and National Institute for Entrepreneurship and small business development Noida) etc. to promote entrepreneurship. A close link will be made with leading bank and DIC/industry department to support the ecosystem.

Figure 18: Key areas of incubation support



Quality System

10. Quality system

The new TC would further aim to obtain various process certificates to enhance its competitiveness like;

Table 31: Indicative certifications of quality systems

Name of certification	Area	Details
ISO 9001	Quality Management System	▶ This would help to monitor, control, and improve quality of products and services offered by the TC ▶ It is a series of standards that define, establish, and maintain a quality assurance system for manufacturing and service industries ▶ ISO 9001 deals with the requirements that organizations wishing to meet the standard must fulfil
ISO 14000	Environmental Management System	▶ Will help to address various aspects of environmental management of the TC ▶ It provides practical tools to identify and control environmental impact and constantly improve their environmental performance ▶ These standards call for analysis of the entire life cycle of a product, from raw material to eventual disposal and focus on awareness of the processes and procedures that can affect the environment
ISO 29990	Learning services for non-formal education and training	▶ For quality professional practice, performance and enhance transparency ▶ Allows for comparison on a worldwide basis of learning services, and management standards in the field of non-formal learning
ISO 50001	Energy management systems	▶ Gives requirement for energy management systems ▶ Establishes framework for industrial plants; commercial, institutional and government facilities and entire organisations to manage energy usage
OHSAS 18001	Occupational Health and Safety standard	▶ Is an internationally-applied British Standard for occupational health and safety management systems ▶ It provides for the elements of an effective safety management system which can be integrated with other management systems and help organizations achieve better occupational health and safety performance and economic objectives
ISO/IEC 17025:2005	Chemical Testing Standard	▶ Is an internationally-applied British Standard for testing and calibration ▶ It covers testing and calibration performed using standard methods, non-standard methods, and laboratory-developed methods

▶ The TC will essentially adopt the 5S technique for process improvement to clean and organise its workspace to improve the workflow. Further trainees will be trained and exposed to 5S process improvement technique. This would require the TC to do the following;

- Sort: To de-clutter the workspace and prioritise tools and materials used frequently, the TC will sort everything in the work area so that unnecessary items (tools, parts, equipment, storage bins, etc) can be removed and either discarded or stored elsewhere.

- Straighten: This will involve creating storage solutions that would facilitate orderly work flow of everything in the TC by placing more frequently used items for quick and easy access.

- Shine: This will require efforts in the initial phase involving painting and installing better lighting to make the workspace clean and tidy. Further during ongoing activities at the TC, the work space and equipment will be cleaned and restored to their proper place at the end of each shift. Basic preventative maintenance tasks like tightening, oiling, restocking will also be part of this. The workstation would then be ready for the next user (or the next day) and the order created in the first two steps will be preserved.

- Standardize: The objective of the same would be to make everyone in the TC familiar about the current steps in order to follow and establish expectations. TC would conduct training, create documented procedures, work instructions, use visual guides, checklists, and/or photos for easy understanding of any changes made. Standardised ways will increase efficiency and be user friendly for TC employees and others.

- Sustain: Sustaining the processes would be important to ensure that focus doesn't drift away from 5S. TC would adopt strategies like daily meetings, mini-audit and ongoing continuous improvement efforts to sustain the 5s.

Infrastructure and Facilities

11. Infrastructure and facilities

The infrastructure of the proposed TC at Baddi has been developed based on the requirements, recommended norms, capacity data of the existing TCs capacity, discussions with key stakeholders and the experience of the team in providing professional advice on similar projects. The team has studied the applicable AICTE/ NCVT norms for development of infrastructure facilities for engineering and technology institutes and detailing out the infrastructure provisions for the proposed TC (attached as Annexure 18.6 for reference) in view of the same. Also leading practises form international training institutes have also been considered. The TC will be built on area of around 25 acres and the layout will have following blocks with required infrastructure.

- Production Block: The highest priority has been given to the allocation of space for installation of machines for production activities. Depending on the space required by the machines, the area for manufacturing should be demarcated which would also include other facilities like toilets, washrooms and change rooms, adequate space for their mobility, clean drinking water in their vicinity etc. This block will also have metrology section which can be accessed by industry directly.
- Training Block: This area will have classrooms, labs, conference hall, faculty rooms and facilities for training / seminars/ workshops etc. Welding Workshop shall be separated from other blocks.
- Administrative Block: This block will have GM and DGMs Office and secretariat. It will also house office and desk space of all management, professional staff, administrative and support staff, library and other amenities such as conference room with video conferencing facility, meeting rooms etc.
- Utilities Block: The utilities block comprises of areas that will house main electrical meter, VCBs, HT panel, distribution panel and power back up DG plant. The utilities block will also house water pumps, purification plant and chilling plant, water treatment plant etc. The open areas around the building will also have some utilities provision such as rain water harvesting pits and panels for the operation of external lighting. Utility will also include sewage treatment plant at an appropriate location.
- Hostel and staff accommodation: The hostel blocks will comprise of accommodation for the students (separate for males and females). A few staff quarters (for driver, security officer, wardens – boys and girls hostel, Maintenance staff etc.) will also be constructed to house some of the emergency staff or on need basis.
- Open Areas: The open areas comprise of drive way, rain water harvesting pit and landscaped areas including the facade and main entry of the TC. The size of the open area will depend on the design strategy adopted by the CMC.
- Others: This will include canteen, parking, security room etc.

- Basic amenities: Apart from the above facilities the campus will have basic amenities with provision for;
  - Drinking water
  - Toilets
  - Dining room as a hygienic area and place away from the work environment for rest breaks and the consumption of food
  - Change rooms to enable employees to change (e.g. uniforms or dirty work clothing) with privacy and security. Such facility helps to reduces employee exposure to and potential spread of contaminating substances used in work processes
  - Personal storage for the secure and clean storage of personal belongings or clothing, lockable where necessary
  - Immediate availability of doctors, health supervisors and ambulance and sufficient first aid kits
  - Fire safety with smoke alarms to protect people against death and injury from fires. Providing fire safety awareness to employees and conduct fire drill from time to time
  - Fire assembly area in case of fire or natural calamity
  - Dustbins with proper colour coding in green for organic, yellow for glass, white for paper, grey for metal, blue for plastic, red for hazardous products

Table 32: Details of proposed infrastructure

Details	Nos.	Total Area (Sq. mt.)
Production Block		4,500
Stores		200
Disposal yard		150
Trial Room		250
Heat Treatment		200
Tool Assembly		700
Machine Shop incl. Maintenance Block		2000
Metrology & Inspection		500
Production Office (Cabins, Documentation & others)		250
Design Office		200
Toilet Block		50
Training Block		5,773
Sr. Manager/HoD Room	1	54
Training Office		
Manager Room	1	54
Reception & Counselling		108
Faculty Room		216
Library with learning facility	1	108
Multi-purpose hall for examination/drawing/reading room	1	216
Classrooms	13	750
Labs	32	1,674
Workshops, including incubation centre	3	2,568

Details	Nos.	Total Area (Sq. mt.)
Toilet		150
Admin Block		624
GM Office & Sect		108
DGM Office		54
Purchase Officer cabin		54
Accounts cabin		
HR & Admin		
Marketing		54
Reception Area		108
Placement Cell with VC		54
Record Room		54
IT Dept/Server Room		54
Sr. Manager& Manager Admin Cabin		54
Toilet Block		30
Conference Rooms		638
Conference Hall 1 (for 30 people)	1	108
Conference Hall 2 (for 150 people)	1	400
Toilet		30
Lunch Area		100
Others		1,805
Dining Area (incl. kitchen, washing, toilet, store etc.)		300
Canteen (incl. toliets,kitchen,store etc.)		1,200
Parking for 2& 4 wheelers and bicycle shed		
Utilities Room - DG Set, Transformer, UPS		250
Security Room (incl toilet)		30
Bank Counter		25
Total		13,340

- Hostel and staff accommodation: The hostel block will comprise of accommodation for students enrolled under fulltime courses along with the hostel warden. Based on calculations, it has been estimated that around 2,200 trainees will be in fulltime courses at any given point of time. Further, on the basis of study conducted and discussions with heads of some of the existing MSME TCs, the provisioning of hostel facility has been done for approximately 20% of the above mentioned capacity. Therefore, it is proposed to develop the hostel capacity for around 444 trainees and out of which 15% (around 64) will be reserved for female trainees. The hostel building has been planned to be G + 3 structures with provision for further vertical expansion depending on future requirements. Part of the ground floor of the hostel building will be reserved for use as hostel office, other common facilities etc. The space on rest of the floors will be developed as rooms for accommodation of students. The details of proposed hostel infrastructure have been given

in the following table. Additionally, eight emergency staff quarters will also be constructed to house some of the key management officials as per requirement. Initially the staff quarters block will be a G+1 structure with a provision of further expanding it vertically depending on future requirements.

Table 33: Details of proposed infrastructure for hostel, staff quarters and guest house

Hostel	Category	Floors	Trainees per Room	Number of trainees	Area per trainees (sq. mt.)	Total Area (sq. mt.)
Hostel No.1	Boys	G+3	4	240	8	1920
Hostel No.2	Boys	G+3	4	120	10	1200
Hostel No.3	Girls	G+3	3	64	10	640
Total						3,960

		Number	Area (sq mtrs)
Staff Qtrs	G+2 (60sqmt/quarter)		
	150	2	300
	100	8	800
	Total	10	1100

Guest House	250 Sqt Meter (4 Room 20 sqm +120 Hall +25% extra)	1	250

Note: All viable options will be studied to decide on the design of the proposed block for hostel and staff quarters. The number of floors for these facility buildings and all other associated details can be further finalised with the appointment of CMC for development of the campus for TC.

As per the details of proposed infrastructure given in above two tables, the construction of the Baddi TC will include development of 18,650 {13,340+ 3,960+1,350 (staff Quarters and Guest house)} square metre of built up area in total. Per square metre cost of construction has been estimated to be INR 22,000. Further, the tentative cost for development of underground water tank, rain water harvesting system, storm water drainage network, water treatment plant, sewage treatment plant, street lighting, development of internal roads, landscaping and grey water treatment plant for entire campus has been estimated to be around INR 400 lakhs. Towards development of boundary wall an estimated cost of INR 100 lakhs has been provisioned. The detail for development of campus infrastructures is as follows;

Table 34: Cost for development of campus infrastructures

SN	Hostel	Cost (in INR lakh)
1.	Cost of development of build-up area @ 22,000 per sq. mt. for 18,650 sq. mt.	4,103
2.	Underground water tank, rain water harvesting system, storm water drainage network, water treatment plant, sewage treatment plant, street lighting, development of internal roads, landscaping and grey water treatment plant and boundary wall	400
3.	Total	4,503
4.	Contingency @ 5%	225
	Grand total	4,728

Further provisioning towards establishment of other associated infrastructure will be done for the planned capacity and is listed in the following table;

Table 35: Details of other infrastructure

SN	Other Infrastructure	Nos.	Budgeted Cost (INR lakhs)	Total Cost (INR lakhs)
1	Office & Storage Furniture	60	0.5	30
2	Hostel Furniture	400	0.25	100
3	Canteen and Hostel Dining hall furniture	20	0.6	12
4	Kitchen equipment	2	20	40
5	Other Office equipment	50	1	50
6	Laptop	20	0.6	12
7	Desktop	40	0.5	20
8	Photocopier cum printer	3	2	6
9	Vehicle	2	12.5	25
10	AC Plant 100 Tons		25	25
11	Electrical Bus Bar		20	20
12	Transformer @2000KVA			20
13	DG Set @ 500KVA			40
14	UPS (for training & production)			25
15	Air Compressor 125 CFM (each) Including piping and accessories	2	15	30
16	Water and Effluent Treatment Plants			50
17	Preliminary expenses	1	40	40
18	Others (Miscellaneous)	1	50	50
	Contigency 5%			29.75

SN	Other Infrastructure	Nos.	Budgeted Cost (INR lakhs)	Total Cost (INR lakhs)
	Total			624.75

Above all, the development of campus infrastructure will be done keeping the following guidelines in mind;

- Campus Layout/ Plan: Campus layout is crucial for successful performance of the TC. At least 30% green area will be maintained and landscaping will be done to improve aesthetics of the surrounding while maintaining habitats conductive to natural fauna. Also, efforts will be made to conserve existing vegetation and other rich biodiversity in the premises as well as vicinity. Apart from this, there will be the following considerations while planning the campus layout:

  - Site drainage: Existing drainage pattern of the available site will be studied and the drainage system required for the TC will be constructed in line with the drainage pattern. Storm water drain will be constructed separately so as avoid mixing of the fresh and the waste water.
  - Heat island effect: Site will be planned properly to mitigate the heat island effect (Thermal gradient difference between developed and undeveloped areas) by following measures:
    - At least 40% of the non-roof impervious surfaces on the site (including parking lots and walkways) will be shaded
    - Pavements and walkways should be painted in light colour (solar reflectance index > 0.5)
  - Boundary: The campus will be provided with boundary wall in all the directions to avoid encroachment, theft and safety.
  - Trees will be planted in large numbers to provide natural shade in the open areas. This helps to reduce the temperature on campus in comparison to the vicinity
  - Efforts will be made to utilize natural light to the maximum possible extent and provision should be made for natural ventilation
  - Green building codes may be adopted while designing the building layout so as to ensure following environmental safeguards;
    - Renewable energy in terms of solar water heater, solar panels, solar street light may be used
    - LED/CFL lights will be used within the premises to reduce the energy consumption
    - Provisioning of water treatment and recycling facility to reduce water consumption
    - Water harvesting arrangement to recharge the ground water and/or reduce dependency on ground water
    - Provisioning of waste management including practices to minimize waste generation, etc.

- Criteria mentioned in the National building code will be followed so as to ensure that all the safety precaution like escape routes/emergency exits, setting of machinery providing appropriate working space, etc. is maintained
- Hazardous material like asbestos sheets should be avoided in any part of the structure
- Substitutes to natural resources will be encouraged in appropriate ratio so as to decrease natural resource consumption while maintaining the required strength (example: Fly ash may be used in small percentage instead of cement for construction, composite material may be used construction of doors instead of wood, etc.
- Provision of toilets for both men and women will be made in appropriate number so as to ensure comfortable and hygienic working conditions
- Energy efficient products like 5 star rated air conditioner, refrigerator, energy efficient motors, etc. will be used in the TC's

- Detailed building plan preparation: The building design is crucial for sustainable performance of the TCs. A number of factors including energy efficiency, materials of construction, natural light and ventilation, insulating, etc. must be kept in mind in order to maintain eco-friendly operations. Also, adherence to aspects related to safety like, resistant to earthquakes, proper evacuations, etc. will ensure successful operations of the TC.
- Construction management: Construction at the site involves a number of activities. These activities may lead to certain EHS impact on the existing natural settings and therefore, appropriate mitigation measures will be required to be put in place so as to minimize or avoid this impact. A snapshot of the issues with the basic principles to be kept in mind during construction is given in the EHS section of this DPR.

Expenditure pattern

12. Expenditure pattern

12.1. Capital expenditure

Total capital expenditure will be to the tune of around INR 102.32 Crore for setting up of new TC at Baddi. Summary of the Capital Expenditure is provided as below:

Table 36: Capital expenditure

Capex(Inc. Contingency @5%)	Cost (INR Lakhs)
Production Machinery and equipment	2,410
Training machines and equipment	2,210
Other infrastructure	625
Building and construction	4,728
Pre-Operative Expenses	258
Total Capex including contingency	10,231

12.1.1. Plant and machinery

Total expenditure on machines to the tune of around INR 4,621lakhs is envisaged for the setting up of new TC at Baddi.

Table 37: Plant & Machinery

Capex	INR Lakhs
Total Plant and Machinery including Contingency @ 5% of capex	4,621

The capital cost estimate for the proposed modernisation project has been prepared jointly by O/o DC-MSME and EY team based on inputs from the following:

- Technology workshop at Bhubaneswar; 2 day detailed sessions led by Dr. Clive Hickman on 'Future Manufacturing Technology Trends',
- Market opportunity assessment by EY team
- Validation of technology needs by detailed discussions and site visits to key manufacturing organisations
- Site visits and discussions with local industry and industry associations.
- Inputs from Office of DC MSME
- Inputs as per the World Bank Environment and Safety requirements

12.1.2. Land & building cost

Baddi has around 20 acres of land available for setting up of the facility of the TC.[30]

Table 38: Land & building cost

SN	Hostel	Cost (in INR lakhs)
1.	Cost of development of build-up area @ 22,000 per sq. mt. for 18,650 sq. mt.	4,103
2.	Underground water tank, rain water harvesting system, storm water drainage network, water treatment plant, sewage treatment plant, street lighting, development of internal roads, landscaping and grey water treatment plant and boundary wall	400
3.	Total	4,503
4.	Contingency @ 5%	225
	Grand total	4,728

12.2. Operating expenditure

The operating expenditure for the TC has been classified into variable operating expenditure and fixed operating expenditure.

12.2.1. Variable operating expenditure

Variable operating expenditure has four key heads. Expenditure under each head has been identified for the key income streams:

a) Raw materials
- Raw materials for finished goods
- Raw materials for training

b) Consumable tools
- Consumable tools for finished goods
- Consumable tools for training

c) Consumable stores
- Consumable stores for finished goods
- Consumable stores for training

d) Utilities (electricity and water)
- Utilities for finished goods
- Utilities for training

[30] Dy. Director of Industries Baddi

Table 39: variable cost assumptions

Description	Unit	Norms
Variable operating cost		
Raw material		
RM for Finished goods	% of FG	20.6%
RM for Training	% of Trg	1.0%
Consumable tools - FG	% of FG	2.5%
Consumable tools – Trg	% of Trg	1.0%
Consumable stores – FG	% of FG	2.0%
Consumable stores - Trg	% of Trg	0.6%
Utilities		
Electricity & water		
FG	% of FG	6.5%
JW	% of JW	6.5%
Training	% of Trg	4.9%

12.2.2. Fixed Operating expenditure

Fixed operating expenditure has four key heads. Expenditure under each head has been identified for the key income streams:

a) Salary and wages/ establishment expenses

The salary expenses include salary for employees of proposed TC at Baddi. There will be 60 employees on regular contract and ~ 170 will be on temporary contract/honorarium visiting.

b) Repairs and maintenance (R&M)

Cost of repair and maintenance has been calculated for

- Plant and machinery installed

  R&M for plant and machinery has been taken as a percentage of the gross block in an operating year.
- Buildings

  R&M for plant and machinery has been taken as a percentage of the gross block in an operating year,

c) Training expenses

Training expenses primarily comprise of expenses incurred for external faculty visiting to the TC from time to time as part of Short term and Long term trainings. These expenses typically include faculty fees, hotel and transportation.

d) Other production and administration expenses

These include expenditure on heads like transportation/entry tax/ freight, Vehicle expenses, Printing and stationery, traveling and conveyance, audit, consultancy, advertisement,

publicity, marketing, telephone, internet, bank charges, miscellaneous expenses. Expenditure under each head has been identified for the key income streams- Finished goods and Training

e) Insurance of new plant and machinery

Insurance expense for new plant and machinery includes the insurance cost for the new machinery to be installed. The same has been calculated as a percentage of the gross block of new machines.

Table 40: Fixed Operating Cost assumptions

Description	Unit	Norms
Fixed Operating Cost		
Salaries & Wages	Detailed assumptions given in a separate table	
R&M (Plant&Mach)	% of Plant	1.0%
R&M (Building)	% of Building	1.7%
Training Expenses		10%
Other Prdnn. & Admin. Exps	%of income	8%
Insurance cost (New P&M)	% of P&M	0.5%
Marketing expenses (1st year)	Rs. Lakhs p.a	25
Marketing expenses (2 year onward)	Rs. Lakhs p.a	15

- Manpower and salary cost

Manpower numbers have been designed in line with the expansion plan of the TC and ramp up of the production, training and consultancy. Manpower salary numbers are in line with the salary structure of existing TCs

Table 41: Manpower and salary assumptions

Top Management	Designation	Monthly salary (INR)	Nos.											
	GM	1,53,861	1	1	1	1	1	1	1	1	1	1	1	1
	DGM	1,29,327						1	1	1	1	1	1	1
Sub Total			1	1	1	1	1	2	2	2	2	2	2	2
Management and Support staff														
Administration and accounting	Manager Admin. and Accounting	69,204	1	1	1	1	1	1	1	1	1	1	1	1
	Sr. Officer HR	62,371						1	1	1	1	1	1	1
	Officer Procurement	35,744			1	1	1	1	1	1	1	1	1	1
	Officer Store	35,744		1	1	2	2	2	2	2	2	2	2	2
	Officer Admin	35,744		1	1	1	1	1	1	1	1	1	1	1
Design and consultancy	Senior manager	86,857		1	1	1	1	1	1	1	1	1	1	1
	Manager	82,777			2	2	3	3	3	3	3	3	3	3
	Sr. Engg.	64,806			2	3	3	3	3	3	3	3	3	3
Production	Senior Manager	86,857		1	1	1	1	1	1	1	1	1	1	1
	Manager Prod./Planning	82,777			1	1	2	2	2	2	2	2	2	2
	Manager Metrology	82,777			1	1	1	1	1	1	1	1	1	1
	Manager H/T	82,777			1	1	1	1	1	1	1	1	1	1
	Manager Maintenance	82,777		1	1	1	1	1	1	1	1	1	1	1

Top Management	Designation	Monthly salary (INR)	Nos.											
	Sr. engg. Maintenance	64,806					1	1	1	1	1	1	1	1
	Sr. Engg. Production	64,806		3	3	3	3	3	3	3	3	3	3	3
	Engg. / Foreman	34,240		2	4	6	6	6	6	6	6	6	6	6
	Senior Technician	29,512		1	2	2	2	2	2	2	2	2	2	2
	Senior Technician Maintenance (Mech + Elect)	29,512		1	1	2	2	2	2	2	2	2	2	2
Training	Senior Manager	86,857		1	1	1	1	1	1	1	1	1	1	1
	Manager Mechanical	82,777			1	1	1	1	1	1	1	1	1	1
	Manager Electronics	82,777			1	1	1	1	1	1	1	1	1	1
	Manager Short term	82,777						1	1	1	1	1	1	1
	Sr. Engg.	64,806		1	5	6	6	6	6	6	6	6	6	6
	Engg.	34,240		1	4	8	10	10	10	10	10	10	10	10
	Senior Technician	29,512		1	2	2	2	2	2	2	2	2	2	2
Sales and marketing	Manager Marketing	82,777		1	1	1	1	1	1	1	1	1	1	1
	Officer Sales	35,744			1	1	1	1	1	1	1	1	1	1
Total (Mgt & Support staff)			1	19	41	51	56	58	58	58	58	58	58	58
Number of employees on temporary contract														
	Training	15,000	-	3	21	44	75	108	119	131	144	151	159	159

Top Management	Designation	Monthly salary (INR)	Nos.											
	Contractual Employees (Production)	10,000			4	10	10	10	12	12	12	12	12	12
employees on temporary contract				3	25	54	85	118	131	143	156	163	171	171

Financial Analysis

13. Financial analysis

13.1. Key assumptions

Project construction and commencement of operations

The project construction is expected to start in the financial year 2015-2016. It is assumed that, the construction period and installation of machines shall be completed in 15 months. Full-scale operations will commence at the end of the construction period of 15 months.

Table 42: Key assumptions

Start of Project	1-Sep-15
Construction period (Months)	15
Commencement of operation, date	1-Dec-16
Number of years, useful life of machines and equipment (as per depreciation rules)	10
Maximum days of operation in a year	300

13.1.1. Income assumptions

- Production

Table 43: Production assumptions

Sr. No.	Machine	Estimated Machine Rate/Hour*	Shift	Hours
1.	CNC Milling-5axis	1500	3	24
2.	CNC VMC-3axis	2000	3	24
3.	CNC VMC-3axis(2)	1000	3	24
4.	CNC Lathe	500	3	24
5.	Conventional Milling	250	3	24
6.	Conventional Lathe	200	3	24
7.	Wire EDM	1500	3	24
8.	EDM Die Sinking	750	3	24
9.	Radial drill machine	150	3	24
10.	Surface Grinding Large	500	3	24
11.	Surface Grinding	600	3	24
12.	Cyl Grinding	400	2	16
13.	Hydraulic press	800	2	16
14.	Mechanical press	600	2	16
15.	Injection Moulding machine	750	2	16
16.	CNC CMM	1500	2	16
17.	Metrology Lab Equipment	800	2	16

Sr. No.	Machine	Estimated Machine Rate/Hour*	Shift	Hours
18.	Chemical and Metallurgical Test labs	3000	2	16
19.	Vacuum HT Plant, Aux. Eqpt & Metallurgy Testing Lab (	750	2	16

Machine utilisation	Year	
2nd year of production	2018-19	25%
3rd year of production	2019-20	40%
4th year of production	2020-21	50%
5th year of production	2021-22	60%
6th year of production	2022-23	70%
year on year increase in machine utilisation and machine hour rate 7th year onwards	2023-24	10%

- Training revenue assumptions

Table 44: Training revenue assumptions

No.	Specialisation	Course name	FEES In '000	Duration (months)	Batch size	No. of Batch/ year	Annual intake
1	Tool Room Processes Tool Design CNC Machining CAD/ CAM/CAE QC & Metrology Automation	Advanced Diploma in Tool & Die making	140	48	60	1	60
		Certificate course in Machinist	40	24	30	1	30
		PG in Tool Design & CAD CAM	105	18	30	2	60
		Post Diploma in Tool and Die Manufacturing	50	12	30	2	60
		Post Diploma in CNC-Prog & Op	25	12	30	2	60
		Post Diploma CAE (manufacturing)	60	12	30	2	60
		Adv. Certificate Course in Tool Design & CAD/CAM	60	12	30	2	60
		Adv. Certificate Course Tool & Die Manufacturing	60	12	30	2	60
		Certificate Course in Tool & Die Making	40	12	20	2	40
		Master of CAD/CAM/CNC	20	6	30	6	180
		Certificate Course in Machine Maintenance	30	12	30	4	120
		Maint Technician	10	3	20	4	80
		Machine Maintenance-mech (Part Time)	18	6	20	2	40
		Maint Technician (Part Time)	12	6	20	2	40
		Adv. Certificate Course CNC Machining (L,M,WC,EDM)	60	12	30	2	60
		Certificate Course CNC Machining (Turn & Milling)	40	12	20	2	40
		Certificate Course in Metrology & QC	30	12	30	4	120
		Master Certificate Course in Computer Aided Tool Engineering	40	6	30	6	180
		CNC lathe programming and operation (Full Time)	9	2	30	12	360
		CNC lathe programming and operation (Part Time)	10	4	30	12	360
		CNC Milling Prog and Operation (Full Time)	10	2	30	12	360
		CNC Milling Prog and Operation		4	30	12	360

No.	Specialisation	Course name	FEES In '000	Duration (months)	Batch size	No. of Batch/ year	Annual intake
		(Part Time)	10				
		CAD/CAM/CNC ENGINEER (Full Time)	10	2	30	12	360
		CAD/CAM/CNC ENGINEER (Part Time)	12	4	30	6	180
		CAD Modelling with different softwares (Full Time)	6	1	30	24	720
		CAD Modelling with different softwares (Part Time)	7	2	30	24	720
		Computer Integrated Manufacturing (CIM)	7	1	30	24	720
		Welding (NCVT recognised course)		12	24	1	24
2	Advance Welding	Basic Arc and Gas welding (Full Time)	10	3	20	4	80
		Basic Arc and Gas welding (Part Time)	12	6	20	4	80
		TIG welding (Full Time)	6	1.5	10	4	40
		TIG welding (Part Time)	6	3	10	8	80
		MiG welding (Full Time)	6	1.5	10	8	80
		MiG welding (Part Time)	6	3	10	8	80
		6 G Pipe Welding (Full Time)	6	2	10	8	80
		6 G Pipe Welding (Part Time)	6	3	10	8	80
		Spot Welding (Full Time)	8	1.5	10	2	20
		Spot Welding (Part Time)	8	3	10	4	40
		Stainless Steel & Aluminium welding (Full Time)	8	1.5	10	2	20
		Stainless Steel & Aluminium welding (Part Time)	8	3	10	4	40
							-
3	Electronics and IT	Basic computer and Hardware (Part Time - 4 hrs)	8	2	20	20	400
		Advanced Hardware & Networking (Part Time - 4 hrs)	12	4	20	10	200
		Solar energy system technician	8	3	12	4	48
		Power plant instrument mechanic		3	12	4	48

No.	Specialisation	Course name	FEES In '000	Duration (months)	Batch size	No. of Batch/ year	Annual intake
			8				
							-
4	Industrial and process Automation (Mining & Mineral Processing)	Industrial Hydraulics	6	1	20	12	240
		Industrial pneumatics	6	1	20	12	240
		PLC Programming	6	1	20	12	240
		Automation Technician	12	4	20	3	60
		Industrial automation design	15	4	20	3	60
		Post Diploma in Mechatronics	60	12	30	2	60
		Diploma in Mechatronics	120	36	30	1	30
5	Training on testing	Chemical testing: Analysis of Metal and Non Metal, Coal, Cement etc.	8	4	20	12	240
		Mechanical: Physical Properties of metal and Non Metal product/material	8	4	20	12	240
		Metallurgical Testing	8	4	20	12	240
		Electrical	5	4	20	12	240
		Total					

- Consultancy revenue assumptions

Revenue from consultancy is expected to start in 2nd year of operation i.e. 2018-19 when the TC is fully operational and all infrastructures are in place.

Table 45: Consultancy revenue assumptions

S. No	Consulting Areas	Suggestive Rev Year 1	Suggestive Rev Year 2	Suggestive Rev Year 3	Suggestive Rev Year 4	Suggestive Rev Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
						50%	30%	30%	30%	30%	30%
1.	Design Support (incl. Product Design)	4,00,000	6,00,000	9,00,000	13,50,000	20,25,000	30,37,500	45,56,250	68,34,375	1,02,51,563	1,53,77,344
2.	Engineering Solutions (Development of Jigs & Fixtures for Machining, Welding, etc.)	1,00,000	1,50,000	2,25,000	3,37,500	5,06,250	7,59,375	11,39,063	17,08,594	25,62,891	38,44,336
3.	Quality System Support	1,00,000	1,50,000	2,25,000	3,37,500	5,06,250	7,59,375	11,39,063	17,08,594	25,62,891	38,44,336
4.	Project Consultancy (curriculum development, community colleges, trainers, etc.)		2,00,000	3,00,000	4,50,000	6,75,000	10,12,500	15,18,750	22,78,125	34,17,188	51,25,781
5.	Low cost Automation Solution Support		1,00,000	1,50,000	2,25,000	3,37,500	5,06,250	7,59,375	11,39,063	17,08,594	25,62,891

6.	Productivity Improvement		1,00,000	1,50,000	2,25,000	3,37,500	5,06,250	7,59,375	11,39,063	17,08,594	25,62,891
Total		6,00,000	13,00,000	19,50,000	29,25,000	43,87,500	65,81,250	98,71,875	1,48,07,813	2,22,11,19	3,33,17,578

13.1.2. Project cost and financing

The project construction will be undertaken in a phased manner. The initial phase will be of about 7 months and final phase will be of about 8 months. Phase 1 is expected to be completed in 2015-16, while phase 2 is expected to get completed by 2016-17. In the initial phase, construction of infrastructure for basic training courses is planned along with procurement of basic machines.

Table 46: Project cost and financing

Project cost and phasing		In lakhs
Particulars	2015-16	2016-17
Project Cost	1,338	8,893
Total	10,231	

13.1.3. Other financial assumptions

Terminal value assumptions:	
Discount rate	9.25%
Growth rate in perpetuity	5.0%
Cost of equity	9.25%

Repair & maintenance, (P&M)	1.0%	of P & M
Repair & maintenance, (Building)	1.7%	of Building
Insurance cost of new P&M (Post commissioning)	0.5%	of Plant & machinery and Building

Working Capital Assumptions		
Cash in Hand	Days	60
Accounts Receivables	Days	90
Suppliers Credit (A/P)	Days	30
Finished goods Storage	Days	30
Inventories (RM, Consumables)		
Finished goods	Days	90
Training	Days	90

Inflation (Salary etc.)	10%

Depreciation Rates				
Asset Class		WDV	SLM	Max Depreciation
Tangible Assets				
	Plant and machinery	13.91%	10.34%	95.00%
	Buildings	10.00%	3.34%	95.00%

13.2. Working capital and cash flow statement

Overall net working capital requirement for the TC is expected to grow from about INR 40 lakhs in 2017-18 to INR 577 lakhs by year 2025-26.

Figure 19: Net working capital requirement

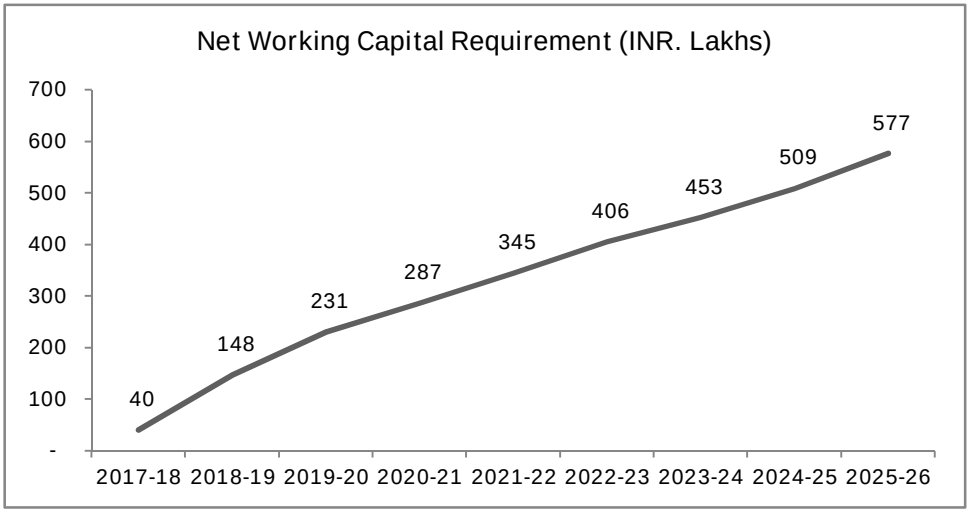


Figure 20: Cash flow closing balance

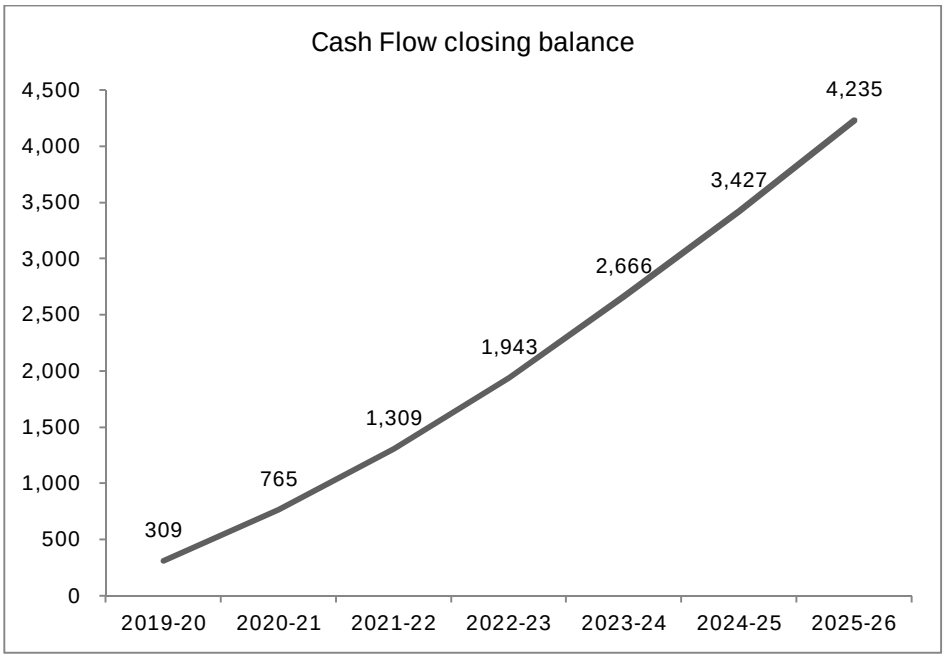


Table 47: Working capital schedule

Working Capital Schedule - With TCSP											
Years	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26
											INR Lakhs
Raw Material Storages											
Finished goods	-	4	18	29	36	43	50	55	61	67	73
Training	0.32	1	2	3	4	4	5	5	6	6	6
Consumable tools											
Finished goods	-	1	2	3	4	5	6	7	7	8	9
Training	0.32	1	2	3	4	4	5	5	6	6	6
Consumable stores											
Finished goods	-	0	2	3	3	4	5	5	6	6	7
Training	0.18	1	1	2	2	2	3	3	3	3	3
Finished Product Storages											
Finished goods	-	7	29	46	58	70	81	89	98	108	119
Accounts Receivables	0.29	25	94	151	190	230	272	307	350	402	469
Gross Working Capital	1.11	40	150	240	301	363	427	477	536	606	693
Suppliers Credit	0.28	0	3	9	14	18	21	24	27	29	32
Net Working Capital Requirement	0.83	40	148	231	287	345	406	453	509	577	661

Table 48: Cash flow statement

Cash Flow												
Years	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27
												INR Lakhs
Income post Depreciation	-27	-207	-1,377	-939	-519	-290	-107	70	220	330	446	612
Add: Depreciation		134	1,174	1,034	911	803	708	625	551	487	430	380
Inflow from capital fund	1,338	8,893										
Capital fund to balance -ve cash flows, if any	27	75	243	13								
Total Cash Inflow	1,338	8,894	39	108	392	513	601	695	771	817	877	992
Investment in Assets	1,338	8,893										
Net Change in WC		1	39	108	83	56	58	61	47	56	68	84
Total Cash Outflow	1,338	8,894	39	108	83	56	58	61	47	56	68	84
Opening Balance						309	765	1,309	1,943	2,666	3,427	4,235
Surplus/Deficit					309	457	543	634	724	760	809	908
Closing Balance					309	765	1,309	1,943	2,666	3,427	4,235	5,144

13.3. Income & expenditure statement

The income to the proposed centre from training will start accruing from year 2016-17 with completion of phase 1 (basic training infrastructure and procurement of basic machines) and start of basic courses. Initially an income of around INR 105 lakhs is expected in year 2016-17. Once the overall construction is complete, the TC revenue is expected to grow from INR 429 lakhs in 2017-18 to INR 3,544 lakhs by year 2025-26.

Table 49: Income and expenditure

Income and Expenditure												
Year	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27
INR Lakhs												
Income												
Training Income		104	346	667	1,030	1,286	1,414	1,556	1,711	1,797	1,886	1,981
Sale of Finished goods			72	290	463	579	695	811	892	981	1,079	1,187
Sale of Scrap		1.0	5	12	19	24	27	31	34	37	40	43
Consultancy Income		-	6	13	20	29	44	66	99	148	222	333
Total Income		105	429	981	1,532	1,918	2,180	2,463	2,736	2,963	3,228	3,544
Expenditure												
Variable Operating expenditure												
Raw materials		1	18	66	106	132	158	183	201	220	242	265
Finished goods			15	60	95	119	143	167	184	202	222	245
Training		1	4	7	11	13	14	16	17	18	19	20
Consumable tools		1	5	14	22	28	32	37	40	43	47	50
Finished goods			2	7	12	14	17	20	22	25	27	30
Training		1	4	7	11	13	15	16	18	19	20	21

Income and Expenditure												
Year	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27
Consumable stores		1	3	10	15	19	22	25	28	30	33	35
Finished goods			1	6	9	12	14	16	18	20	22	24
Training		1	2	4	6	8	8	9	10	10	11	12
Utilities (Electricity & water)		5	22	52	81	101	115	129	142	152	163	175
Finished goods			5	19	30	38	45	53	58	64	70	77
Training		5	17	33	51	63	70	76	84	88	93	97
Variable Operating expenditure		8	49	142	224	280	327	374	411	446	484	525
Fixed Operating Expenditure												
Salary & Wages/ Establishment expenses	27	146	336	432	524	678	772	878	1,001	1,121	1,258	1,384
Repairs and Maintenance			133	133	133	133	133	133	133	133	133	133
P&M			46	46	46	46	46	46	46	46	46	46
Buildings			87	87	87	87	87	87	87	87	87	87
Training Expenses			35	67	103	129	141	156	171	180	189	198
Other Prdnn. & Admin. Exps			33	76	119	149	169	191	212	230	250	275
Marketing expenses		25	25	15	15	15	15	15	15	15	15	15
Insurance of new machines			22	22	22	22	22	22	22	22	22	22
Fixed Operating Expenditure	27	171	583	745	915	1,125	1,253	1,395	1,553	1,700	1,867	2,027
Total Expenditure	27	179	632	887	1,140	1,405	1,579	1,769	1,965	2,146	2,351	2,552
Income (Gross Margin)	(27)	(74)	(203)	95	392	513	601	695	771	817	877	992
Depreciation	-	134	1,174	1,034	911	803	708	625	551	487	430	380
Income post Depreciation	(27)	(207)	(1,377)	(939)	(519)	(290)	(107)	70	220	330	446	612

13.4. Balance sheet

Table 50: Balance sheet

INR Lakhs

Balance Sheet												
Years	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27
Liabilities												
Capital fund	1,338	10,099	8,964	8,038	7,519	7,229	7,122	7,193	7,412	7,742	8,189	8,800
Total	1,338	10,099	8,964	8,038	7,519	7,229	7,122	7,193	7,412	7,742	8,189	8,800
Fixed Assets												
Gross Block	1,338	10,232	10,232	10,232	10,232	10,232	10,232	10,232	10,232	10,232	10,232	10,232
Less: Accumulated Depreciation	-	134	1,308	2,341	3,252	4,055	4,763	5,387	5,938	6,425	6,855	7,236
Net Block	1,338	10,098	8,924	7,890	6,979	6,177	5,469	4,844	4,293	3,806	3,376	2,996
Current Assets												
Cash	-	-	-	-	309	765	1,309	1,943	2,666	3,427	4,235	5,144
Other Current Assets	-	0.8	40	148	231	287	345	406	453	509	577	661
Total	1,338	10,099	8,964	8,038	7,519	7,229	7,122	7,193	7,412	7,742	8,189	8,800

13.5. Profitability

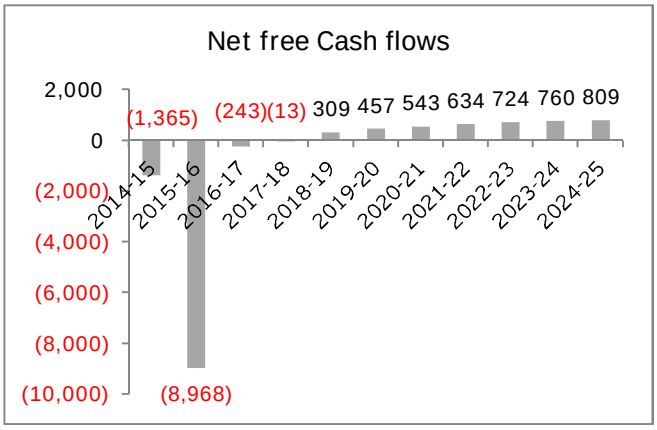
Overall project profitability has been estimated considering phased investment in plant & machinery and infrastructure. The full-fledged operations are expected to start from the year 2017-18. Hence the project IRR for a period of 12 years till 2026-27 is 10.7%.

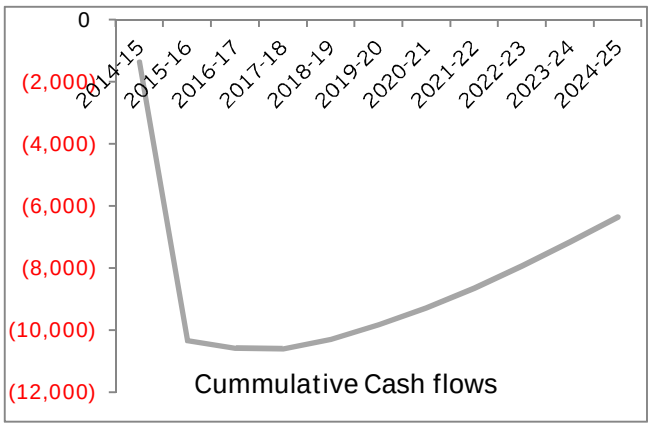
Table 51: Profitability with investment plant & machinery

Project IRR	10.7%
Payback period	>11 years

The project is expected to generate positive net free cash flows starting year 2019-20.

Figure 21: Net free Cash flows and Cumulative Cash flows





13.6. Sensitivity analysis

Sensitivity analysis of Project IRR has been carried out with respect to the key project parameters.

- Project cost
- Revenue from Training
- Revenue from production
- Revenue from Consultancy

The project IRR is most sensitive to changes in training revenue, followed by changes in project cost, production revenue and consultancy revenue.

Training forms majority of revenue for the TC followed by production and consultancy.

0.5 percent increase/decrease in training revenue increases / decreases the project IRR by about 0.93%.

5 percent increase/decrease in project cost decreases/ increases the project IRR by about 0.56%

5 percent increase/decrease in production revenue increases / decreases the project IRR by about 0.45%.

Consulting being the lowest contributor to revenue has the lowest impact on project sensitivity. 5 percent increase/decrease in consultancy revenue increases / decreases the project IRR by about 0.16%.

Table 52: Sensitivity of IRR

		Construction period (15 Months)
Increase in Project cost	-5%	11.2%
	0%	10.7%
	5%	10.1%
	10%	9.6%

		Construction period (15 Months)10.9%
Increase in Consultancy revenue	-5%	10.5%
	0%	10.7%
	5%	10.8%
	10%	11.0%

Increase in Training revenue	-7.5%	8.9%
	-5%	9.5%
	0%	10.7%
	5%	11.7%
	10%	12.7%

Increase in Production revenue	-10%	9.7%
	-5%	10.2%
	0%	10.7%
	5%	11.1%
	10%	11.5%

Environment, Health and Safety

14. Environment, health and safety

Effective management of environmental, health, and safety (EHS) issues entails the inclusion of EHS considerations at various levels during project implementation. It is proposed that World Bank EHS guidelines will be followed to adhere to the desirable performance levels and measures while developing the TC.

14.1. Environment

14.1.1. Air emissions

The expected manufacturing processes in the proposed TC with air emissions would be sintering, metal cutting, grinding and / or forming (including forging, wire drawing, pressing, stamping, among others), quenching, annealing and other general treatments, abrasive treatments (e.g. shot, sand blasting), solvent degreasing and emulsion, alkaline, and acid cleaning, welding, anodizing, chemical conversion coating, electroplating, painting and other metal finishing techniques (Including polishing, hot dip coating). To counter the problems, the following techniques will be used:

- Volatile Organic Compounds (VOC) emissions management strategies will be used which include:
  - Installation of refrigerator coils (or additional coils) above the degreaser vapour zone
  - Application of an air flow over the top of the degreaser that should not typically exceed 40 m / minute
  - Rotation of parts before removal from the vapour degreaser, including:
    - Installation of thermostatic heating controls on solvent reservoirs and tanks
    - Installation of in-line filters to prevent particulate build- up
    - Use of solvent recovery to reduce emissions of VOC from curing ovens
    - Use of activated carbons to recover solvent vapours
  - In order to reduce emissions during welding and coating, metal surfaces would be carefully cleaned
  - Coatings would be removed from the base metal before welding preferably using mechanical cleaning (for example blasting with CO2-pellets) instead of solvents.
- Dust: Dust emissions management strategies will be used which include:
  - Installation of in-line aspirators with filters or scrubbers. Electrostatic precipitators (ESP) will also be employed
  - Where possible, maintaining wetness on the metal surface in order to prevent or minimize dust production
- Acid / Metals Content in Mists and Fumes: Management strategies for acid / metal content in mist and fume emissions will be used which include:
  - Use of fume suppressants as additives to electroplating baths to reduce air emissions of

electroplated metals (e.g. chromium)

- Installation of in-line aspirators with filters to eliminate acid compounds
- For metals or metal oxides abatement, installation of filters capable of handling complex metals
- Welding fumes (a mixture of metals, oxides, and smoke from burning off oil) would be controlled by removing coatings from base metals

14.1.2. Wastewater and liquid wastes

Typical sources of wastewater discharged from product manufacturing process in the proposed TC would include water-based cleaning and rinsing streams, cooling water, alternative cleaners, wastewater generated from cutting, blasting, deburring and mass finishing activities and water-based metalworking fluid operations. To counter the problems, the following techniques will be used:

- Oil-based Effluents
  - Effluent separation from wastewater, and special disposal will be done if recycling is not possible
  - Standardization of use of oil types, and efficient scheduling of processes that require use of varying oil types
  - Extension of the life of cooling liquid through use of centrifuges, introduction of periodical analyses, use of biocides and ultrafiltration, and removal of oils by disk or belt skimmers.
  - Appropriate housekeeping techniques to prevent cutting oils from being contaminated with solvents will be used
  - Oil quench baths would be recycled by filtering out metals
  - Metal-working fluids would be recovered using collection (or drip) pans under functional machinery;
  - In cold forming or other processes where oil is used, automatic oilers would be used to reduce grease accumulation. A stamping lubricant suitable for conditions leading up to thermal treatment processes would be taken into consideration.

- Solvent and Water-based Effluents
  - Solvents would be carefully managed to prevent spills and fugitive emissions
  - Less hazardous degreasing agents (e.g. petroleum solvents, vegetable cleaning agents, VCA, supercritical CO2 or alkali washes) would be considered, in addition to the use of counter current solvent cleaning (two-stage: first cleaning with dirty solvent, followed by fresh solvent); Aqueous non-VOC-containing alkali washes would be used for metal cleaning whenever possible. Some of these can be regenerated by microfiltration
  - Spent-degreasing solvents would be recycled on site, reusing batch stills and waste solvents

- Cold cleaning with recycled mineral spirits would be implemented before final vapour degreasing
- Acids in wastewaters would be recovered through evaporation;
- Rinse contamination would be reduced via drag-out by optimization of part operation, using surfactants and other wetting agents;
- Mechanical cleaning techniques would be used instead of chemicals where possible (e.g. a vibrating abrasion apparatus for brass rather than acid pickling; mechanical scraping instead of acid solution to remove oxides of titanium; and rotating brush machines with pumice to clean copper sheets);
- Concentrations of dissolved metal ions would be controlled and reduced (e.g. molybdenum concentration reduction through reverse osmosis / precipitation systems; use of non-chromate solutions for alkaline etch cleaning of wrought aluminium; use of sulphuric acid / hydrogen peroxide dip instead of cyanide and chromic acid dip for copper- bright dipping process)
- Acid or alkaline pickling solutions would be replaced, if possible, with alternative cleaning agents (e.g. use of caustic wire cleaner with biodegradable detergent and use of linear alcohols instead of sulphuric acid to pickle copper wire, provided that adequate safety and fire prevention is implemented)
- Flow restrictors / control meters would be installed and a foot pump (or photo sensor for automatic lines) would be used to activate rinse
- Process wastewaters would be treated and recycled, using ion exchange, reverse osmosis, electrolysis, and electro dialysis with ion exchange.

► Surface Treatment / Finishing Wastewater:

- Strong agents and toxic surfactants would be substituted by less hazardous alternatives;
- Anodizing and alkaline silking baths would be regenerated by recuperation of metallic (e.g. aluminium) salts through use of hydrolysis of sodium aluminate;
- Stocks of finishing material would be limited with short shelf lives;
- Painting jobs (light to dark) and the selection of spraying techniques would minimize wastewater production (e.g. use of a spray gun for particular applications, use of an electrostatic finishing system instead of conventional air spray);
- The use of chlorinated solvents would be avoided and substituted (including carbon tetrachloride, methylene chloride, 1,1,1- trichloroethane, and perchloroethylene) with non-toxic or less toxic solvents as cleaning agents;
- Chromic acid and trisodium phosphate would be substituted by less toxic and non-fuming cleaners (e.g. sulphuric acid and hydrogen peroxide), and cyanide cleaners would be substituted by ammonia;
- Less toxic bath components would be used (e.g. zinc in place of cadmium in alkaline / saline

solutions; nitric or hydrochloric acids in place of cyanide in certain plating baths; zinc chloride in place of zinc cyanide);

- Drain boards, drip guards, drip bars, and dedicated drag out tanks would be installed, after process baths.

- Metals in Wastewater:
  - The management of water consumption is crucial, as it also reduces the usage of raw materials and their loss to the environment. Good process control and drag-out reduction are key factors to reduce the consumption of hazardous raw materials;
  - Wastewaters with recoverable metals would be separated from other wastewater streams. Metals would be recovered from solution (e.g. using electrolytic cells or hydroxide precipitation);
  - Used metal pickling baths would be sent to a continuous electrolysis process for regeneration and metal recovery;
  - Metals from bright dipping solutions would be recovered using suitable processes (e.g. ion exchange system for copper, or segregating phosphates from treatment of aluminium based alloys);
  - Solutions containing cyanide salts (e.g. for hardening processes) would be replaced with solutions using a fluidized bath of nitrogen and corundum;
  - Hexavalent chromium would be substituted for plating. If this is not possible closed loops and covered vats would serve to minimize emissions.
- Process Wastewater Treatment: Since general manufacturing operations, including metals, plastics and rubber products use a myriad of raw materials, chemicals and processes, wastewater treatment will require the use of unit operations specific to the manufacturing process in use. Techniques for treating industrial process wastewater in this sector include source segregation and pre-treatment of concentrated wastewater streams. Typical wastewater treatment steps include:
  - Greasing of traps, skimmers, dissolved air floatation or oil water separators for separation of oils and floatable solids
  - Filtration for separation of filterable solids
  - Flow and load equalization
  - Sedimentation for suspended solids reduction using clarifiers
  - Biological treatment, typically aerobic treatment, for reduction of soluble organic matter (BOD)
  - Biological nutrient removal for reduction in nitrogen and phosphorus
  - Chlorination of effluent when disinfection is required
  - Dewatering and disposal of residuals in designated hazardous waste landfills.

14.1.3. Waste water management

Wastewater management would include water conservation, wastewater treatment, storm water management, and wastewater and water quality monitoring.

- Industrial Wastewater: Industrial wastewater generated from industrial operations includes process wastewater, wastewater from utility operations, runoff from process and materials staging areas, and miscellaneous activities including wastewater from laboratories, equipment maintenance shops, etc.

  Process Wastewater: Adequate treatment technology will be used to achieve the desired discharge quality and to maintain consistent compliance with regulatory requirements. The design and operation of the selected wastewater treatment technologies will be done to avoid uncontrolled air emissions of volatile chemicals from wastewaters. Residuals from industrial wastewater treatment operations will be disposed in compliance with local regulatory requirements or will be consistent with protection of public health and safety, and conservation and long term sustainability of water and land resources.

- Wastewater from Utilities Operations: Utility operations such as cooling towers and demineralization systems in the TC may result in high rates of water consumption, as well as the potential release of high temperature water containing high dissolved solids, residues of biocides, residues of other cooling system anti-fouling agents, etc. Water management strategies for utility operations will be used which include:
  - Adoption of water conservation opportunities for facility cooling systems
  - Use of heat recovery methods (also energy efficiency improvements) or other cooling methods to reduce the temperature of heated water prior to discharge to ensure the discharge water temperature does not result in an increase greater than 3°C of ambient temperature at the edge of a scientifically established mixing zone which takes into account ambient water quality, receiving water use, potential receptors and assimilative capacity among other considerations;
  - Minimize use of antifouling and corrosion inhibiting chemicals to ensure appropriate depth of water intake and use of screens. Least hazardous alternatives would be used with regards to toxicity, biodegradability, bioavailability, and bioaccumulation potential. Dose applied would accord with local regulatory requirements and manufacturer recommendations;
  - Testing for residual biocides and other pollutants of concern would be conducted to determine the need for dose adjustments or treatment of cooling water prior to discharge.

- Storm Water Management: Storm water includes any surface runoff and flows resulting from precipitation, drainage or other sources. Typically, storm water runoff contains suspended

sediments, metals, petroleum hydrocarbons, Polycyclic Aromatic Hydrocarbons (PAHs), coliform, etc. Rapid runoff, even of uncontaminated storm water, also degrades the quality of the receiving water by eroding streambeds and banks. In order to reduce the need for storm water treatment, the following principles would be applied:

- Storm water would be separated from process and sanitary wastewater streams in order to reduce the volume of wastewater to be treated prior to discharge
- Surface runoff from process areas or potential sources of contamination would be prevented
- Where this approach is not practical, runoff from process and storage areas would be segregated from potentially less contaminated runoff
- Runoff from areas without potential sources of contamination would be minimized (e.g. by minimizing the area of impermeable surfaces) and the peak discharge rate would be reduced (e.g. by using vegetated swales and retention ponds)
- Where storm water treatment is deemed necessary to protect the quality of receiving water bodies, priority would be given to manage and treat the first flush of storm water runoff where the majority of potential contaminants tend to be present;
- When water quality criteria allows, storm water would be managed as a resource, either for groundwater recharge or for meeting water needs at the facility;
- Oil water separators and grease traps would be installed and maintained as appropriate at refuelling facilities, workshops, parking areas, fuel storage and containment areas.
- Sludge from storm water catchments or collection and treatment systems will contain elevated levels of pollutants and would be disposed in compliance with local regulatory requirements, in the absence of which disposal has to be consistent with protection of public health and safety , and conservation and long term sustainability of water and land resources.

► Sanitary Wastewater: Sanitary wastewater from industrial facilities includes effluents from domestic sewage, food service, and laundry facilities serving site employees. Miscellaneous wastewater from laboratories, medical infirmaries, and water softening etc. can also be discharged to the sanitary wastewater treatment system. Sanitary wastewater management strategies will be used which include:

- Segregation of wastewater streams to ensure compatibility with selected treatment option (e.g. septic system which can only accept domestic sewage)
- Segregation and pre-treatment of oil and grease containing effluents (e.g. use of a grease trap) prior to discharge into sewer systems
- If sewage from the industrial facility is to be discharged to surface water, treatment to meet national or local standards for sanitary wastewater discharges or, in their absence,

the indicative guideline values applicable to sanitary wastewater would be met

- If sewage from the industrial facility is to be discharged to either a septic system, or where land is used as part of the treatment system, treatment to meet applicable national or local standards for sanitary wastewater discharges will be done.
- Sludge from sanitary wastewater treatment systems would be disposed in compliance with local regulatory requirements, in the absence of which disposal has to be consistent with protection of public health and safety , and conservation and long term sustainability of water and land resources.

14.1.4. Solid waste management

The TC will establish waste management priorities at the outset of activities based on the understanding of potential Environmental, Health, and Safety (EHS) risks and impact and considering waste generation and its consequences. The TC will do the following with respect to the same;

- Establish a waste management hierarchy that considers prevention, reduction, reuse, recovery, recycling, removal and finally disposal of wastes.
- Avoid or minimize the generation of waste materials, as far as practicable
- Minimize, recover and reuse waste where waste generation cannot be avoided
- Treat, destroy and dispose waste in an environmentally sound manner where waste cannot be recovered or reused

The manufacturing and related operations (e.g. wastewater treatments or fume reduction) will generate solid waste at the TC. Its management measures will include:

- Separating metal dust or scrap by type to promote recovery and recycling
- Reducing and treating slags from welding, forging, machining, and mechanical finishing, which may contain metal ions
- Proper management of metals removed from wastewaters for recovery or disposal; disposal of sludge from surface finishing processes (e.g. galvanizing, painting, hot dip)
- If reuse or recycling is not possible, the waste would be disposed of according to industrial waste management recommendations in the General EHS Guidelines

14.2. Occupational health and safety

The TC is proposed to implement all reasonable precautions to protect the health and safety of employees and students as per the World Bank norms. Although the focus will be placed during the operation of TC, much of the occupational health and safety guidance will also be followed during the construction and decommissioning activities. Preventive and protective measures will be introduced according to the following order of priority:

- Eliminating the hazard by removing the activity from the work process e.g. substitution with less hazardous chemicals, using different manufacturing processes, etc.
- Controlling the hazard at its source through use of engineering controls e.g. local exhaust ventilation, isolation rooms, machine guarding, acoustic insulating, etc.
- Minimizing the hazard through design of safe work systems and administrative or institutional control measures e.g. job rotation, training safe work procedures, lock-out and tag-out, workplace monitoring, limiting exposure or work duration, etc.
- Providing appropriate personal protective equipment (PPE) in conjunction with training, use, and maintenance of the PPE.

The application of prevention and control measures to occupational hazards will be done based on comprehensive job safety or job hazard analyses. The results of these analyses should be prioritized as part of an action plan based on the likelihood and severity of the consequence of exposure to the identified hazards. The general EHS guidelines: occupational health and safety will be followed with respect to the following;

- General facility design and operation
  - Integrity of workplace structures
  - Severe weather and facility shutdown
  - Workspace and exit
  - Fire precautions
  - Lavatories and showers
  - Potable water supply
  - Clean eating area
  - Lighting
  - Safe access
  - First aid
  - Air supply
  - Work environment temperature
- Communication and training
  - OHS Training

- Visitor Orientation
- New Task Employee and Contractor Training
- Labelling of Equipment
- Area Signage
- Communicate Hazard Codes

- Physical Hazards
  - Rotating and Moving Equipment
  - Noise
  - Vibration
  - Electrical
  - Eye Hazards
  - Welding / Hot Work
  - Industrial Vehicle Driving and Site Traffic
  - Working Environment Temperature
  - Ergonomics, Repetitive Motion, Manual Handling
  - Working at Heights

- Chemical Hazards
  - Air quality
  - Fire and explosions
  - Corrosive, oxidizing, and reactive chemicals
  - Asbestos Containing Materials (ACM)

- Biological and radiological hazards: Biological agents represent potential for illness or injury due to single acute exposure or chronic repetitive exposure. Radiation exposure can lead to potential discomfort, injury or serious illness to workers. Appropriate strategies as per the guideline will be taken for Prevention and control of such hazards.

- Personal protective equipment (PPE) to provide additional protection to workers exposed to workplace hazards in conjunction with other facility controls and safety systems.

14.2.1. Monitoring

Occupational health and safety monitoring programs would be undertaken to verify the effectiveness of prevention and control strategies. The selected indicators should be representative of the most significant occupational, health, and safety hazards, and the implementation of prevention and control strategies. The monitoring program would include;

- Safety inspection, testing and calibration

- Surveillance of the working environment
- Surveillance of workers health
- Training

14.2.2. Monitoring accidents and diseases monitoring

The TC will,

- establish procedures and systems for reporting and recording
  - Occupational accidents and diseases
  - Dangerous occurrences and incidents
- enable and encourage employees to report management all
  - Occupational injuries and near misses
  - Suspected cases of occupational disease
  - Dangerous occurrences and incidents
- Investigate of all reported incidences with the assistance of a person knowledgeable/ competent in occupational safety

14.3. Addressing potential EHS issues

The key possible issues with respect to Environment, Health and Safety (EHS) for establishment of the new TC at Baddi during the construction phase, operation and maintenance phase and tool manufacturing are as follows;

14.3.1. Construction phase

The activities and anticipated EHS issues during the construction phase are highlighted in the following sections:

Table 53: Activities and anticipated EHS issues during construction phase

Activity	Associated impact	Recommendation for mitigation
Clearing of land (before initiating the construction work, clearing of the shrubs and bushes shall be carried out)	Soil erosion	▶ It would be ensured that the construction activity immediately follows the clearing of land to avoid soil erosion.
Excavation, drilling and levelling for the construction of foundation and base of building and roads	Air pollution	▶ Water sprinkling at regular intervals during excavation and drilling activities would be practiced to avoid generation of dust. ▶ The excavated soil would not be stored in the direction of the wind and covers to be provided for loose construction material. ▶ Activities like digging and filling will be avoided in conditions of very high wind. ▶ Construction machinery will be properly maintained to minimize exhaust emissions of CO. SPM and Hydrocarbons.
	Soil erosion/ Loss of Top soil	▶ Effort would be made to use the overburden within premises for landscaping. ▶ During levelling, gradation across the land (If any) would be reduced to the extent possible.
	Noise pollution	▶ Regular maintenance of plant equipment will be carried out. ▶ Noise prone activities will be undertaken during day time and shall be avoided, to the extent possible, during night time. ▶ Personal protective equipment will be provided for workers performing drilling at site.
	Occupational health hazards	▶ Provision of adequate personal protective equipment like safety helmets, face masks, safety shoes, safety goggles etc. for the safety of workers. ▶ The excavated area would be provided with a visible boundary (Usually created using a tape and sticks) to ensure safety at site. ▶ Training will be imparted to workers on occupational safety and technical aspects of job undertaken by them.
	Disposal of debris and	▶ The waste and debris would be disposed of at an identified place preferably wasteland and appropriate approval should be taken for the same from land owner or revenue authorities. ▶ The disposal site would be at least 1000 meters away from the areas including notified forest

Activity	Associated impact	Recommendation for mitigation
	other wastes	land, water bodies and productive lands.
Establishing labour camp (Provision of civic amenities for construction labour and movement of truck drivers for transporting construction material shall be provided at the site. The labour camps at the project site will be temporary in nature)	Health Risks	▶ Provision of separate mobile toilet facilities for men and women will be made. ▶ The domestic effluent will be properly disposed of in soak pits. ▶ Contractor will provide garbage bins to all workers' accommodation for dumping wastes regularly in a hygienic manner in the area. ▶ First aid box would be provided at every construction campsite and under the charge of a qualified person to provide first aid. Availability of such person should be ensured at all time. The first aid box would contain the following in case of less than 50 workers at the site; i) Twelve small sterilized dressings. ii) Six medium size sterilized dressings. iii) Six large size sterilized dressings. iv) Six large size sterilized burn dressings. v) Six (1/2 oz.) packets sterilized cotton wool. vi) One (2 oz.) bottle containing a 2 per cent alcoholic solution of iodine. vii) One (2 oz.) bottle containing sal-volatile having the dose and mode of administration indicated on the label. viii) One roll of adhesive plaster. ix) One snake-bite lancet. x) One (1 oz) bottle of potassium permanganate crystals. xi) One pair of scissors. xii) One copy of the first-aid leaflet approved by the Chief Inspector of Factories.
	Chances of spread of sexually transmittable diseases like AIDS	▶ Awareness programmes will be conducted regularly for workers on AIDS, and other health related issues. ▶ Health check-up facilities for employees and contract workers.
	Water pollution	▶ Separate mobile toilet facilities will be made available for male and female workers. The domestic effluent will be properly disposed of in soak pits. ▶ Adequate drinking water facilities, sanitary facilities and drainage in the temporary sheds of the construction workers would be provided to avoid the surface water pollution.
	Land contamination	▶ Basic sanitary facilities will be provided for the workers staying at the labour camp and at the project site. ▶ Dustbins will be provided at the camp by the contractor.

Activity	Associated impact	Recommendation for mitigation
Movement of vehicles (Vehicle movement shall prevail at the site to transfer the material and workers at site. Apart from this, third party vehicles delivering the material and equipment shall also be there.)	Air pollution	▶ All the vehicles entering the site will be asked to have updated PUC (Pollution under control) certificate. ▶ Vehicle speed will be restricted to 15km/hour at site. ▶ Trucks/dumpers will be covered by tarpaulin sheets during off site transportation of friable construction materials and spoil. ▶ Maintenance of vehicles will be carried out regularly. ▶ Sprinkling of water will be practiced at the site.
	Soil contamination	▶ Proper maintenance of vehicle will be carried out to avoid any leakage of oil or grease.
	Water contamination	▶ Proper maintenance of vehicle will be carried out to avoid any leakage of oil or grease.
	Safety risks	▶ Vehicle speed will be restricted to 15km/hour at site. ▶ Necessary safety trainings will be provided to the drivers of construction vehicles for speed restrictions and dos' and don'ts will be followed during movement of construction vehicles.
Use of D.G set (D.G sets shall be used at site to provide electricity to labour camps in the night time. Also, in case of non-availability of power from grid, D.G sets shall be used to provide electricity at the site for construction activity)	Air pollution	▶ D.G will be optimally used with proper orientation and adequate stack height. ▶ Stack monitoring will be carried out on regular basis. ▶ Proper maintenance of the DG will be carried out on regular basis.
	Noise pollution	▶ Acoustic enclosures will be provided with the D.G sets to minimize the noise levels.
Storage of diesel (Diesel shall be stored on-site so as to ensure availability for D.G sets)	Soil contamination	▶ A covered area will be defined for storage of HSD with concrete flooring
	Safety risks	▶ The diesel storage area will not be in proximity of the labour camps. ▶ Inflammable substance will not be allowed at the project site.
Handling of waste (During construction phase there may be generation of both hazardous and non-hazardous waste which needs to be carefully handled to ensure environment safeguard)	Land contamination and Water contamination	▶ Waste will be stored at designated place after segregation on the basis of category (hazardous and non-hazardous). ▶ Hazardous waste will be disposed of to the authorized vendors only. ▶ A waste management plan will be chalked out to properly dispose the debris generated from the site.
	Safety risks	▶ Adequate PPE's will be identified and provided to the workers at site.
Installation and operation of concrete mix plants and batching plants (In	Noise pollution	▶ Noise shielding will be used where practicable and fixed noise sources will be acoustically treated for example with silencers, acoustic louvers and enclosures.

Activity	Associated impact	Recommendation for mitigation
case, these are installed on temporary basis at the project site)		▶ Provision of make shift noise barriers near high noise generating equipment will be made to minimize horizontal propagation of noise in case of residential area in the vicinity.
Construction labour management	Child labour and forced labour	▶ Provision of clause in contractor's agreement will be made that bans child labour and forced labour at project site. ▶ Adequate procedures to avoid or prevent hiring/entry of child labour at the project site will be undertaken; ▶ Random check will be undertaken at the site.
	Health and safety risks for children of workers	▶ Temporary crèche facility will be provided in case of migrant labourers children residing in the camps to ensure safety.
	Water wastage	▶ Emphasis will be given on optimization of water usage and supply of potable drinking water for labour camps.
	Pressure on forest produce	▶ Fuel will be made available to construction workers so as to reduce pressure on forest produce or local fuel wood resources.

14.3.2. Operation and maintenance

There are a number of environment aspects and health and safety hazards which may arise during operations and due to negligence towards appropriate maintenance work in a TC. A snapshot of potential aspects and hazards are as follows:

Table 54: Potential hazards during O & M phase

Potential impact	Recommendation for mitigation
Deterioration of the structure over the period of time	▶ Maintenance and repair work would be carried out on regular basis to slow down/mitigate the deterioration of the structure. ▶ A structural stability certificate would be taken from a chartered engineer every 5 years. ▶ Any change in the layout of the equipment, bringing heavier machinery in place of a small one or putting more number of machinery in a particular place, would be approved by the chartered engineer to ensure that the modification in layout is not going to impact the stability of the structure.
Water contamination	▶ Cleaning of the terrace of the building would be practiced so as to ensure that the rain water collected through water harvesting is not contaminated. Alternatively, first rain harvest would be washed through the storm water drain in case of rain abundant area.

Fire risk	▶ Fire extinguishers will be checked for pressure on annual basis. ▶ Fire hydrant system would be checked once in six months to ensure it is operational. ▶ Electrical wiring in the premises would be regularly checked and repair should be undertaken wherever required.

14.3.3. Manufacturing

Table 55: Potential hazards during manufacturing phase

Activity	Associated impact	Recommendation for mitigation
Hand tool manufacturing		
Hammering during forging process	Noise pollution and hear loss over longer period of time	▶ Ear plugs/muffs would be provided to the employees and students working in the hammering process. ▶ Level of noise would be monitored on regular basis so as to ensure that the noise level is within specified limits. ▶ Hammering would not be carried out during night time. ▶ Regular audiometric test of employees would be carried out in order to understand if any person is susceptible to hearing loss and in case such situation is encountered the person would be shifted to other department and provided with medical facility.
	High vibrations	▶ Monitoring of the vibration will be conducted on regular basis.
Heat treatment	Air pollution	▶ Ventilation would be provided in work shop to avoid concentration of the fumes.
	Burn injury	▶ Employees would be provided with Apron while working in the workshop. ▶ Workplace safety training will be provided on regular basis. ▶ Eye wash and shower facility would be provided in the facility. ▶ Appropriate PPE including, gloves, safety shoes, goggles, etc. would be provided to employees and the students.
	Heat stress	▶ Heat stress monitoring of the employees will be conducted once a year to ensure safe and appropriate working conditions.
Non-maintenance of clean premises	Injury due to trips	▶ Cleaning schedule will be developed for the site. ▶ Proper demarcation of the storage area for waste material will be done according to the different type of waste material.
Handling of waste (Hazardous and non-hazardous waste generated during day to day	Land contamination and Water	▶ Waste will be stored at designated place after segregation on the basis of category (hazardous and non-hazardous). ▶ Hazardous waste will be disposed of to the authorized vendors only.

Activity	Associated impact	Recommendation for mitigation
operations to be carefully handled to ensure environment safeguard)	contamination	▶ A waste management plan will be chalked out to properly dispose the debris generated from the site.
	Safety risks	▶ Adequate PPE's will be identified and provided to the workers at site.
Use of D.G set (D.G sets shall be used at site to provide electricity in case of power failure)	Air pollution	▶ D.G set will be optimally used with proper orientation and adequate stack height. ▶ Stack monitoring to be carried out on regular basis. ▶ Proper maintenance of the D.G set to be carried out on regular basis.
	Noise pollution	▶ Acoustic enclosures will be provided with the D.G sets to minimize the noise levels.
Storage of diesel (Diesel shall be stored on-site so as to ensure availability for D.G sets)	Soil contamination	▶ A covered area will be defined for storage of HSD with concrete flooring.
	Safety risks	▶ Inflammable substance will not be allowed in the premises.
Specialised Tool manufacturing		
Designing of components	Depletion of natural resource (paper)	▶ Paper would be recycled for rough work.
Machining activities	Land contamination due to waste oil and waste coolant	▶ SOP would be formulated for handling and storage of waste oil and coolant. ▶ A designated area would be identified to store these wastes under the shed. ▶ The hazardous waste will be disposed of to an authorised recycler and shall not be used internally for any purpose until prior permission is sought from SPCB.
	Water contamination due to waste oil and waste coolant	
	Noise pollution due to pressing and shearing activities	▶ Ear muffs / Ear plugs will be provided to officials working on these activities.
	Land contamination	▶ The metal scrap would be collected appropriately and stored in a designated area before being

Activity	Associated impact	Recommendation for mitigation
	due to metal scrap	disposed of/sold to a third party.
	Cut/injury due to metal scrap lying unmanaged	
Use of D.G sets	Noise pollution	▶ Acoustic enclosures would be provided to avoid noise pollution.
	Land contamination	▶ Diesel would be poured in D.G set using funnel. ▶ Concrete flooring would be made near the D.G set.
	Air pollution	▶ Chimney with appropriate height would be provided to minimize air pollution and compliance with the legislation.
Storage of hazardous waste like empty printer cartage, waste coolant, oil soaked cotton waste, etc.	Land and water contamination due to leakage and/or spill over	▶ The storage area of the hazardous waste will be cemented in order to avoid land contamination. ▶ Proper demarcation of storage area for hazardous waste will be done to avoid chances of spill over during handling. ▶ All the waste will be stored under a shed so as to avoid contamination and washing away of waste in nearby water stream or ground water in case of rain
	Water contamination due to leakage and/or spill over	▶ All the waste will be stored under a shed so as to avoid contamination and washing away of waste in nearby water stream or ground water in case of rain.

The protection of public health, safety and general welfare will also be ensured through adherence to the building codes since these are related to the construction and occupancy of buildings and structures.

14.4. Provisioning of site services

The following section outlines the details of the essential measures to be designed as per regulatory requirements relating to maintenance such as;

- Fire alarm and firefighting system,
- Rain water harvesting,
- Water treatment and sewage treatment,
- Ventilation system.

14.4.1. Fire alarm and firefighting system

a) Fire alarm system

- Automatic Fire alarm system will be provided in all buildings of the campus excluding student hostels and emergency staff quarters.
- The system will have appropriate provisioning of smoke detectors and beam detectors with respect to the sensitivity and probability of fire.
- Fire alarm panels will be provided at appropriate locations with easy and convenient accessibility for manual activation of alarm in case failure of automatic system.
- A control panel will be provided at control station with a repeater panel in security cabin to activate, deactivate and reset the fire alarm system.
- The instrumentation, panels, sensors and equipment used will be of certified make confirming to relevant standards.
- Smoke detectors and beam detectors will be installed above and below false ceiling as applicable.

b) Firefighting system – overview

- Firefighting system comprising of sprinklers, yard hydrants and pumping station will be provided.
- Sprinklers system will be provided in the production area (above and below the false ceiling), training block, administrative building (all floors) and other buildings etc.
- Yard/ field hydrant system will be provided throughout campus with hydrant posts at appropriate locations having operating valve and hose reel provided in hose reel boxes as per standards.
- Staircases in all buildings will be provided with wet risers.

- The piping network will have suitable size/ diameter MS pipes welded at joints or connected with socket and threaded joints as per the regulations.
- All pipes will be painted in red colour as per the standards.
- The hydrant and sprinkler system will be connected to piping network and will be continuously charged with water at appropriate pressure as per applicable standards.
- All equipment and items used in firefighting system will conform to relevant codes of practice, standards, rules and regulations applicable.
- Fire water tank of minimum 2000 Cum capacity/ one hour supply will be provided.
- The tank will be placed overhead/ above ground so that the pumps operate in negative suction and with required level of water even when they are off.

c) Pump room

- The pumping station will be located near the fire water tank to store adequate volume of water for firefighting as per rules and regulations set by local fire authority and guidelines by NBC.
- Both the sprinkler system and hydrant system will be fed with common electrically driven pump, backed with a diesel engine driven pump of adequate capacity to maintain required pressure in the pipe line.
- Electrically driven jockey pump of adequate capacity will be provided in the pumping station, which will be positioned and programmed in such a way that jokey pump starts first in case there is any loss of pressure in the fire pipe line.
- The pumps will be automatically operated and control panels with required switchgear, logic will be provided to control the pumps.
- Necessary arrangements for power supply will be done for the fire pumps.
- The power and control cables used for fire pumps will be fire rated and conforming to relevant applicable standards.
- The pumps will be placed on adequate foundations/ pedestals with adequate support to the piping.
- The pump room will be covered with canopy roof in steel structure and pre-coated sheets.
- All electrical fittings and accessories in pump room will be of weatherproof category IP55.

d) Sprinkler system

- The sprinkler pendants/ heads provided will be of appropriate category as per the hazard category and water required to extinguish fire. This will be governed by appropriate design standards and regulations of local fire authority.
- At least one test sprinkler will be provided in each area for periodic testing of the system.
- The density of sprinklers will be as per applicable regulations.

e) Hydrant system

- The hydrant system will comprise of ring main and other circuits around all buildings in the campus, thus making it possible to reach to any corner in case of fire.
- Hydrant system will have hydrant posts at appropriate locations.
- The hydrant post will have hose reel box with hose reel of appropriate length with nozzle as per applicable regulations.
- The hydrant posts and the hose reels will be easily accessible.
- Appropriate valves will be provided on the hydrant posts to operate the hydrant and connect hose reel whenever required.
- Sufficient valves will be provided in each loop of the hydrant system to enable maintenance of any portion of line without draining the firefighting system and releasing pressure in remaining portion.
- 4 way valves will be provided at appropriate places allowing connection with external fire tenders mounted on truck.
- Wet risers will be provided in every staircase of each building with suitable reel drum having rubber hose of adequate length fit with suitable nozzles.
- The hydrant network pipes will be placed above ground and only the crossings will be underground wherever required.

f) Fire water tank

- Water tank with adequate capacity will be provided to store water for firefighting purpose.
- Arrangement will be done in such a way that the water sourced will first be filled in the primary fire water tank and the excess overflow from this tank will be put in to domestic and other water tanks.
- The tank will be site assembled with FRP or other panels using appropriate technology and will be placed above ground.

14.4.2. Rain water harvesting

- The campus will be divided in to 4 or 5 areas and the storm water from the roof top of each building in each area will be collected in the specified area.
- The storm water outlets on building roofs will be checked for adequacy with respect to size considering maximum rainfall intensity in past 100 years.
- Additional outlets will be provided to the building roof, in case the existing outlets are found to be insufficient.
- The outlets will be provided with vertical down take pipes, which will be connected to the existing underground storm water lines through nearby chambers.

- Suitable locations for ground water recharge pit will be identified in each area as mentioned above.
- Considering geology, ground water tables, applicable rules and regulations and available space, ground water recharge pits with bore holes and pipes will be designed with adequate capacity.
- The ground water recharge pits will be connected to the storm water line through nearest chamber to fetch storm water (collected on roof) to the pit.
- Overflow will be provided to the ground water recharge pit at suitable level, to take off excess water back to the storm water network and discharge off.
- The ground water recharge pits will be protected with fence around to prevent ingress of people, animals etc.
- Suitable provision will be made to cut off and on the flow to the ground water recharge pits.

14.4.3. Water treatment plant

- Water treatment plant with 2 types of treatment will be provided on campus;
  - Water softening (1,50,000 ltrs/Day).
  - Water purification with suitable RO and UV (25,000 Ltrs/Day).
- The water treated with softening plant will be used for general domestic purpose except for drinking.
- The drinking water will be treated using water purification plant with RO and UV technology.
- Adequate piping network conforming to applicable rules, regulations and standards will be provided for supply of drinking water at various locations within the facility.
- The softened water will be supplied through existing water supply network to various locations in the premises.
- The existing water supply network will be inspected for leakages, damages for appropriate repairing.
- The equipment provided for water treatment will be standard and approved/ certified by appropriate government bodies certifying such equipment.
- Arrangements for power connection including laying cables and necessary switch gears at both ends at main supply point and machine point will be provided.
- Adequate drainage will be provided for regeneration of both treatment plants, while connecting the same to primary and secondary effluent treatment.

14.4.4. Sewage treatment plant

- Sewage Treatment plant with integral effluent treatment will be provided for primary and secondary treatment with capacity of 60 Cum/day.

- The primary treatment will be through the use of septic tanks of adequate capacity, located at various places near the toilet blocks on campus.
- The septic tanks will have adequate manholes for cleaning and maintenance purpose and will also have gas vents rising above the highest level of the buildings to avoid foul smell.
- Overflow outlets of the septic tanks will be connected to secondary treatment achieved through properly designed constructed wet land system with sub-surface flow.
- The constructed wetland will consist of locally available species of wetland trees, bushes and shrubs.
- Collection tank of adequate capacity will be provided on the upstream of the constructed wetland to take care of incidental heavy flows.
- The constructed wetland will be located suitably in the premises allowing adequate sunlight for growth of plants throughout the day.
- Provision will be made to allow rejection and regeneration discharge from water treatment plant by dissolving high TDS water suitably.
- Necessary de-odouring and chemical dosing will be provided at the end of wetland before the water obtained is reused.
- All equipment used and the design, arrangement will be in compliance with applicable rules and regulations as laid down by town planning authority, central pollution control board and other local authorities.

14.4.5. Ventilation system

a) Internal buildings

- The TC premises will have provision for sufficient ventilation. This will be done keeping in view the amount of space in the TC, number of people expected to occupy the space, type and amount of machines/equipment, and overall size of the space. The designing will be done keeping in view proper distribution of air for ventilation throughout all occupied spaces across the TC.
- Natural ventilation - The premises will have adequate openings, such as doors, windows and/or vent opening to clean environment. Roof vents would be placed wherever applicable to reduce the reliance on air conditioning systems and also reduce CO2 emission in the building.
- Mechanical ventilation – Mechanical parts would be installed to provide air to building occupants at a comfortable temperature and humidity that would be free of harmful concentrations of air pollutants.
- Provision for adequate supply of outdoor air in the indoor environment will be provided to dilute pollutants released by equipment, building materials, furnishings, products, and people. The building's ventilation system will be properly installed with filters to trap such particles.

- Air input, smoke exhaust will also be installed and maintained for proper ventilation.
- Hybrid ventilation systems are popular in industrial buildings which predominantly use natural ventilation along with mechanically driven fans to improve predictability of performance over a wider range of weather conditions. Provisioning of the same will be taken into account wherever applicable during designing the ventilation system.

b) Manufacturing/ Production area

- Precision machining and QC areas will be provided with central air conditioning.
- Air quality in production area will be checked for vital parameters such as concentration of CO2, CO and other relevant gases during operations.
- In case the parameters above are not acceptable as per relevant standards, adequate capacity fresh air system will be designed and provided for production area to improve quality of air.
- The fresh air supply system will consist of an external air handling unit of adequate capacity with suitable grade filters on inlet side.
- The outlet of the air handling unit will be connected with duct system supplying air inside the production area at various places.
- The fresh air will be discharged in the production area by providing suitable diffusers.

c) UPS room

- Appropriately designed ventilation system will be provided to the UPS room.
- The ventilation system will mainly comprise of air conditioning units providing cold air at lower temperature and exhaust system taking out hot air coming out of the UPS.
- The system will be designed to maintain adequate temperature around the UPS equipment as per manufacturer's requirements/ specifications.
- Humidity will be controlled to the desired level as directed by the UPS manufacturer by controlling inflow of fresh air.
- Proper ventilation will be provided to battery racks with adequate number of air changes as per applicable rules and regulations.

Key risks and mitigation

15. Key risks and mitigation

The key risks associated with implementation of the project along with possible mitigation measures are e summarized in this section. It must be noted that risks universe is dynamic and is likely to change periodically. It is recommended that frequent analysis is carried out and mitigation plans are drawn. Below are risks that may impact this project;

Table 56: Risk & mitigation

Key broad area	Risk	Mitigation	Impact on		
			Cost	Time	Resources
Project Planning	Risk of inadequate planning of time, effort and resources required to complete the project	▶ Adequate time and cost buffer to be kept to deal with contingencies. ▶ Appointment of CMC for detail design and project management during construction of the TC	✓	✓	✓
Approvals and Clearances	Risk of delay in clearances from local authorities like ▶ Plan Sanction – Town Planning Authority/ Local Body ▶ Commencement Certificate – Town Planning Authority/ Local Body ▶ Fire NOC – Provisional and Occupancy – Local Fire Authority ▶ Plinth Checking Certificate – Town Planning Authority/ Local Body ▶ Building Completion Certificate – Town Planning Authority/ Local Body ▶ Consent to Establish and Operate – Pollution Control Board ▶ MAP Approval and Factory License – Directorate of Industrial Health and Safety ▶ Labour License – Labour Commissioner ▶ Fuel Storage – Chief Controller of Explosives	▶ Appointment of PMC firm. ▶ Timely application of approvals for relevant authorities by CMC ▶ Monitoring of status of Approvals.		✓	

Key broad area	Risk	Mitigation	Impact on		
			Cost	Time	Resources
	▶ Tools, Tackles, Pressure Vessels, Hoists – Competent Engineer ▶ Electrical Systems – Electrical Inspector				
Environmental risk	Loss of top soil	▶ Top soil excavated from the site should be carefully handled. It should be collected separately and stored as a heap which is appropriately covered. The heap should not be put in the direction of wind to avoid dust generation ▶ Maximum effort should be made to utilize the top soil for landscaping within the site	✓		✓
	Air pollution due to digging and levelling activities	▶ Water sprinkling shall be practiced ▶ Construction machinery shall be properly maintained to minimize exhaust emissions of CO, SPM and Hydrocarbons ▶ These activities shall be avoided in very high wind and cover should be provided for loose construction material	✓		✓
	Water contamination and health risks associated with setting labour camp for construction	▶ Toilet shall be earmarked for both men and women contractual workers ▶ Adequate drinking facilities shall be provided at the construction site; ▶ Temporary crèche facility may be provided in case of migrant labourers children residing in the camps to ensure safety	✓		✓
	Land and water contamination due to waste generated at site	▶ Waste shall be stored at designated place after segregation on the basis of category (hazardous and non-hazardous) ▶ Hazardous waste shall be disposed of to the authorized vendors only	✓		✓
	Air pollution due to use of D.G set.	▶ D.G set to be optimally used with proper orientation and adequate stack height ▶ Stack monitoring carried out on regular basis ▶ Proper maintenance of the DG Set should be			

Key broad area	Risk	Mitigation	Impact on		
			Cost	Time	Resources
		carried out on regular basis ▶ Acoustic enclosures are to be provided with the D.G sets to minimize the noise levels			
Construction	Delay in construction due to cost overrun, management of building contractors.	▶ Appoint a PMC for a design and build contract for managing construction. ▶ Strict timeline will be made and agreed with PMC. ▶ Regular M&E, Built in mechanism for penalty for delays and incentive for timely completion, ensuring timely payment based on milestones.	✓	✓	
Deviation in project scope	Change in project scope ▶ initiated by MoMSME, ▶ Machinery supplier constraints ▶ Product discontinuation	▶ Clear buy in on project plan and execution planning. ▶ Identification of Machinery suppliers based on the top current suppliers and technology available.	✓	✓	✓
Maintaining World Class Construction quality	Construction quality may not be up to the mark.	▶ Appointment of third party Government quality assurance agency.			
On-boarding of Key players	Delay in on boarding of key project stakeholders • Technology Partner • Construction Network Manager • Construction Management Consultant Quality Assurance	▶ Clearly defined scope and incentives for stakeholders. ▶ Timely contracts with the project stakeholders.		✓	✓
Procurement of machinery	Delay in procurement of machines and goods due to high Lead time and time taken for clearances	▶ Machines and equipment chosen should be standard and popular models available in market. Early release of order confirmation and advance if any. ▶ Appointment of efficient and pre-approved Clearing & Handling Agency (CHA) to ensure timely clearances and transportation of machines.		✓	
	Variation in Equipment required and finally	▶ Neutral specifications to be drafted based on	✓	✓	

Key broad area	Risk	Mitigation	Impact on		
			Cost	Time	Resources
	procured. Too stringent specs may lead to high price and low competition, loose specs may lead to low price but low quality	thorough research on TC requirements and current models available.			
Trained resource availability	Availability of trained manpower for operation of new machines	▶ Machine specific training programmes to be conducted for training of key personnel and knowledge sharing.			✓
Market	▶ Change in product mix ▶ Change in customer mix ▶ Change in technology ▶ Change in product pricing ▶ Competition from Govt./Public tool rooms ▶ Lack of cluster development in the target region	▶ Expansion of product base. ▶ Increase in customer base. ▶ Develop a backup plan for retiring of obsolete machines.			
Policy	Change in Government Policy/ Schemes for ▶ Training ▶ key sectors E.g. Change in Government space programme, increase in imports may affect orders from major clients	▶ Increase existing customer base. ▶ Diversify into new sectors.	✓		✓
Taxation	Change in service tax policy on training may adversely affect training revenue	▶ Institute should keep abreast with policy changes and the same should be considered while designing the course and fee structure.			
Human resource	▶ Labour availability ▶ Retention of key employees (Flight of key talented people can make it difficult to achieve centre's growth plans)	▶ Planning for holidays and lean periods. ▶ Good incentive scheme and career development plans.	✓		✓
Management risk	Lack of capable management to run the TC	▶ Leadership training. ▶ Succession planning.			✓
Maintenance risk/ spares - Availability of spares & services	Delay in availability of spares and service support at a reasonable cost	▶ Procure models that are likely to continue for at least next 5 yrs. to ensure better availability of spares and services.	✓		
Performance of key	Poor performance of Outsourced agencies	▶ Establishment of KPIs			✓

Key broad area	Risk	Mitigation	Impact on		
			Cost	Time	Resources
stakeholders	like TP, CNM and PMC	▶ Periodic review of performance. Suitable penalty clauses to be added in the ToRs.			
Weather	Delay in construction due to monsoon season	▶ Planning for lean periods and periods of low construction activity.	✓	✓	

Conclusion

16. Conclusion

The TC at Baddi is proposed to be a General Engineering TC. Tool manufacturing, training and consultancy / advisory streams would be the prominent activities to be undertaken by the TC. This also includes support to MSME clusters in technology and engineering solutions and for improvement of their quality systems and productivity. The TC will make a concerted effort in reaching out to MSMEs for these works. For improvement in productivity, TC would initiate design clinics, training in lean manufacturing and project based consultancy. The TC would further put greater emphasis to equip itself to provide consultancy services to MSMEs in the field of product design and development, tool design, manufacturing and innovations in process and productivity.

TC will contribute towards skilling youth to make them employable in industry by designing courses relevant to them. The focus areas for the proposed TC are in line with objectives of the program. This will be further be complemented by the proposed innovative ideas for the TC like;

- The new TC will take steps to form consortium with MSMEs including TRs to jointly cater to the focus sectors. Once formed, the TC would further formalise and institutionalise the consortium. The TC should provide handholding/ support and special machining & testing facility to members of this consortium and prepare a road map for the next 3-5 years to ensure that these MSME can develop the required expertise and become more competitive

- The TC will form Productivity and Quality club for cluster of engineering industry and support them for a period of 12 months in which each cluster club of about 10 MSMEs will be assigned a mentor (Sr. Engineer Production/ Design/ Training and above). The mentor will make periodic visits to the MSMEs. He will plan and handhold in the execution of the plan at the MSMEs so as to have a visible improvement at the end of 12 months period. Membership can be for a nominal fee. Quality club and Productivity club may be formed separate and the KPI of mentors will be decided based on the results achieved by MSME units. .

All these initiatives of the TC would not only strengthen the expertise of MSMEs in manufacturing but also help to develop a sustainable ecosystem for MSMEs in the region in the long run. On the same line, even investments have been proposed keeping the focus area and adherence to EHS guidelines in mind.

Above all, TCSP program will enable TC to showcase the best practices not only in the adoption of new technologies and skilling the youth but also managing all the associated environmental and social aspects.

Annexure

17. Annexure

17.1. Budgetary estimates of machines

Machine	Make	Model	Specification	Price			Price (INR) @20 Escalation
				Euro	USD	INR	
3 AXIS VMC	HAAS	VM3	1016X660X635		117215	70,32,900	84,39,480
	DMG MORI	CTX450 (TURN MILL)	650X465 C AXIS	107190		86,82,390	1,04,18,868
	DMG MORI	DMF260	2600X700X700	310440		2,51,45,640	3,01,74,768
	RAMBAUDY		2500x1500x1500	10,00,000.00		8,10,00,000	9,72,00,000
	HARTFORD	HSA323	3000X2200X780		2,40,000	1,44,00,000	1,72,80,000
	HARTFORD	HEP 2150	2250X1500X780		170000	1,02,00,000	1,22,40,000
CNC LATHE	DMG MORI	CTX450 V1	650	90900		7362900	88,35,480
	HAAS	ST-40	648X1118		157155	94,29,300	1,13,15,160
	JOBBERS	JOBBERS JR CNC	1875X1740X1720			47,92,15,080	57,50,58,096
Grinder	KENT	KGS920AHD	2000X900		124275	74,56,500	89,47,800
	KENT	KGS925AHD	2500X900		137270	82,36,200	98,83,440
Cylindrical Grinder	PAC	PACGRID Z3040X8/1	1000X200			850,000	10,20,000
Radial drilling machine PAC		PACDRIL Z3040X8/1	240			450,000	5,40,000
Radial drilling machine	PAC	PACDRIL Z3050X16/1	1250			750,000	9,00,000
Injection moulding machine	PAC	ESM 60 TON SERVO SRIVE	600 TON		140000	84,00,000	1,00,80,000
UPS	AIRCOM	ht series3:3	20kva,5min 20X20 battery				2,32,920
	AIRCOM	ht series3:3	40kva,5min 12x20battery				2,32,920

17.2. Key questions asked during telephonic discussions

1. What are the key types of tools/ products manufactured?
    a.
    b.
    c.
    d.

2. What are the key sectors catered?
    a.
    b.
    c.
    d.

3. Have you ever taken any support from MSME Tool room? If yes, in which field?
    a. tool design
    b. tool manufacturing
    c. Training
    d. Consultancy

4. Would you be interested to take support from MSME Tool room? If yes, in which field?
    a. tool design
    b. tool manufacturing
    c. Training
    d. Consultancy

5. Can you mention key areas/ products you plan to venture in future, where MSME tool rooms can support?

6. Would you be open to formation of consortium with MSME Tool Rooms and for manufacturing?

7. What are the key manufacturing technologies/ processes currently in use?

8. What are the key issues and challenges faced in current processes/ technologies to cater to current requirements?

9. What are key technologies that are required but currently not available?

10. What are key skills required for managerial manpower and machine operators?

11. Existing gaps in skills required for Managerial manpower and Machine operator level?

12. Additional skills required to cater to new requirements

17.3. List of MSMEs/other manufacturers contacted in primary survey

SN	Name of the Unit	Region	State	Contact
Discussion over telephone				
1.	Abbott toolfast private limited	Faridabad	Haryana	Mr. Pawan Abbott, 9810033948
2.	Meneta automotive components private limited	Sonipat	Haryana	Mr. Rajender Singh, 0130 6991768
3.	Modern metals India Private limited	Faridabad	Haryana	Mr. Ankit Gupta, 9910012626
4.	Stitch overseas private limited	Gurgaon	Haryana	Mr. Parveen Satija, MD, 0124 4755400
5.	RIYA electrodes private limited	Faridabad	Haryana	Mr. Alok Mishra, 9990803660
6.	JBM auto limited	Gurgaon	Haryana	Mr. H.R. Saini, ED, 9811322081
7.	Marposs India private limited	Gurgaon	Haryana	Mr. Sarabjit Singh, 9871900871
8.	Nagata India private limited	Gurgaon	Haryana	Mr. Praveen Rao, 9810223466
9.	Star wire (India) limited	Faridabad	Haryana	Mr. P.N. Singh, 9350150755
10.	Indian machine tool manufacturers' association	Gurgaon	Haryana	Mr. Srinjay Dash, 9560333553
11.	Agie charmilles (south east Asia) private limited	Bengaluru	Karnataka	Mr. Sureh Peter, 8888775522
12.	Customised technologies private limited	Bengaluru	Karnataka	Dr. R A Narayanan, 9880022700
13.	Acme toolings	Hyderabad	AP	N Satish (Production), 9701346793, 9701346790
14.	Nebashi CNC automation private limited	Hyderabad	AP	Mr Srinivasan 040 – 66622095, 40038721
15.	Vasantha tool crafts private limited	Hyderabad	AP	Mr Giri (Production & Marketing) 040 44613333, 040 44613330
16.	Ferromatik milacron India private limited	Ahmedabad	Gujrat	079-25890081, 25890133, 25830063
17.	Global special springs private limited	Ahmedabad	Gujrat	Mr. Rajesh Samal, Manager, 9898594269
18.	Assab sripad steels limited	Chennai	Tamil Nadu	Mr. P.N Krishnaswamy, (Technology) , 93241 50695
19.	Chennai CNC servotronics private limited	Chennai	Tamil Nadu	Mr. D. Subramanian ,MD, 98410 21334
20.	Omax auto limited	Gurgaon	Haryana	Mr Sahu, 9953628953, Mr Umed Singh , 9540800820
21.	Agrim components limited	Faridabad	Haryana	Mr Rajkumar , 01294173174
22.	Arvind engineering	Faridabad	Haryana	1292234359
23.	Bony polymers limited	Faridabad	Haryana	Mr Jabbar Ali Khan, 9650922844

SN	Name of the Unit	Region	State	Contact
24.	Continental engines limited	Bhiwadi	Rajasthan	Mr Mahesh, 9810305566
25.	DM enterprises	Gurgaon	Haryana	9911225512
26.	Forgewell limited	Faridabad	Haryana	Mr Shyam Khandelwal, 9810038448
27.	Horizon industrial products Private limited	Manesar	Haryana	Mr Abhi Bhatti , 9268567207
28.	M/s Indo alusys India limited	Bhiwadi	Rajasthan	Mr B.S.Trivedi, 9672991453, 01493306500, 01143758100
29.	Kiran udyog	Gurgaon	Haryana	toolroom2@kiranudyogindia.com, 01244365095
30.	M.R.A metal private limited			Mr Ajay, 01302367585
31.	Machino polymers limited	Gurgaon	Haryana	Mr Vikas Arora , 01244684200
32.	Mytex polymers India private limited	Manesar	Haryana	Mr Manoj Kumar Shyam , 9251012179
33.	Paracoat products private limited	Bhiwadi	Rajasthan	Mr Arvind Haldia , 9351006102
34.	Prime polymers	Faridabad	Haryana	01292233794
35.	Rasandik engineering	Gurgaon	Haryana	Mr Monty, 9812431693
36.	RICO auto industries	Khandsa	Haryana	Mr Ram Millen Verma , 9810854803
37.	SKH auto components	Faridabad	Haryana	9650004227
38.	SRS die casting	Gurgaon	Haryana	Mr Vineet Ahuja, 9899290883 Mr Pawan kumar, 9999012015
39.	Tokai engineering private limited	Manesar	Haryana	Mr Pardeep, 9899119508, pardeep.design@tokaiengineering.com
40.	Uttam strips private limited	Bhiwadi	Rajasthan	Mr Ravinder, 7891005931 Mr Rajiv Malhotra, 7891005884
41.	Vikram fabricators	Faridabad	Haryana	Mr Malik - 98 10 060740, 9312260031
42.	Tata Motors	Jamshedpur	Jharkhand	Mr. Kahli, Manager Tool Room, Tata Motors Jamshedpur
43.	Tata Motors	-	-	Mr. Santosh Raout, Tool Procurement Manager (Nano), TATA motors
44.	Renault Nissan	Chennai	Tamil Nadu	Mr. Nitin Solanki and Mr. Prasana, Tool Procurement Managers
45.	General Motors	Bengaluru	Karnataka	Mr. Venkatesh M, Development manager (tooling)
One to One discussion meeting				
46.	Maruti suzuki	Gurgaon	Haryana	Mr M.K.Gupta, GM, 9811158136 Mr S.K.Sharma, Manager (MSTA), 01242341416 Mr Bhupendra Singh

SN	Name of the Unit	Region	State	Contact
				Rana, Dy. Manager (Training academy), 9811743255
47.	Nagata India private limited	Gurgaon	Haryana	Mr Mittul Soni, MD 9810312809, Mr Rajiv Sharma, Manager (Design), 9810603608 Mr U.K. Singh , GM (Operations), 9818897900
48.	JBM auto limited	Faridabad	Haryana	Mr Rakesh Chandra Kushwaha, Dy GM, 9711209656
49.	Hero motocorp	Dharuhera	Haryana	Mr Sandeep Wadhwani , Senior manager (Engineering) - 9466080065, Mr M.M.Singh, Dy GM (Human resources), , Mr Sudhansu Sekhar (Product trainer and 9868142186Senior manager human resources), 9311806958
50.	Neel metal products limited	Gurgaon	Haryana	Mr Anuj Agarwal, VP (Corp. projects), 9999211288
51.	Motherson automotive technologies and engineering	Gurgaon	Haryana	Mr Sanjeev Sharma, AVP, 9650566500
52.	CIPET	Gurgaon	Haryana	Mr. Sisir Kumar, Regional Head, CIPET, Gurgaon
53.	Munjal Showa	Gurgaon	Haryana	Mr. Rakesh Atre, Associate Vice President, Business Excellence
54.	Indian Machine Tool Manufacturers Association	Gurgaon	Haryana	Mr. Srinjoy Das, Director and Head- North Region,9560333553
55.	Shriram pistons and rings limited	Alwar	Rajasthan	Mr. Devendra Mishra, ED & Head, Pathredi works, 8094018032
56.	Motherson sumi systems limited	Bhiwadi	Rajasthan	Mr. S.R. Unnithan, Dy. GM, 8696926880
57.	Hi Tech gears limited	Bhiwadi	Rajasthan	Mr. Akhilesh Agarwal, GM, 9717522663

17.4. AICTE norms for engineering and technology institutes

a) Land requirement for technical institutions

Other than Rural Places			Rural Areas		
UG Programs	Diploma	Standalone PG Programs	UG Programs	Diploma	Standalone PG Programs
2.5	1.5	2.5	10	5	10

Land area requirements in acres

- Land Area Requirements:
  - Land area shall cover hostel facilities, if any
  - Land shall be in one continuous piece
  - Considering hilly nature of land in North Eastern States, land may be made available in 3 pieces which are not away from each other by more than 1 Km
- Number of students generally allowed per acre land available when FSI = 1 is 300.
- Built up Area Requirements
  - The Institution area is divided in, Instructional area (INA, carpet area in sq. m.), Administrative area (ADA, carpet area in sq. m.), Amenities area (AMA, carpet area in sq. m.)
  - Circulation area (CIA) is equal to 0.25 (INA+ADA+AMA).
  - Total built up area in sq. m. is equal to (INA+ADA+AMA) + (CIA)

- Instructional area (carpet area in sqm)

	Number of Divisions (UG class of 60)	Duration of course (in yrs)	Class Rooms (C)	Tutorial Rooms(D) PG class rooms (H)	Laboratory	Research Laboratory	Work Shop	Additional WS/Labs for Category X courses	Computer centre	Drawing Hall	Library and Reading Room	Seminar Halls
Carpet area in sqm per room			66	33	66	66	200	200	150	132	400	132
Engineering/ Technology (Degree Institute)												
Number of rooms required for new institution	A	4	C=A	D=C/4	10	-	1	-	1	1	1	1
Total number of rooms (UG)	A	4	C=Ax 4	D=C/4	10/Course*	-	1	2/Course (Max 4)	1	1	1	1/Course
Total number of rooms (PG)	F	2	-	H=Fx2	1/Specialization	1/Specialization	1	2/Course (Max 4)	1	1	1	1/Course
Where, • Category X of courses: Mechanical, Production, Civil, Electrical, Chemical, Textile, Marine, Aeronautical and allied courses of each. • Classrooms, Tutorial rooms and Laboratories required for 2nd, 3rd and 4th year may be added progressively to achieve total number as stated. • Additional Library (Reading room) area of 50 sq m / per 60 student (UG+PG) intake beyond 420. • UG laboratories if shared for PG courses shall be upgraded to meet requirements of PG curriculum • Progressive requirement, 2nd year onwards shall be calculated as 3+3+2 labs/course • Additional 5 Labs/Course when number of divisions are more than 2/course. • Round off fraction in calculation to the next integer.												
Engineering/ Technology (Diploma and Post Diploma Institute)												

	Number of Divisions (UG class of 60)	Duration of course (in yrs)	Class Rooms (C)	Tutorial Rooms(D) PG class rooms (H)	Laboratory	Research Laboratory	Work Shop	Additional WS/Labs for Category X courses	Computer centre	Drawing Hall	Library and Reading Room	Seminar Halls
Carpet area in sqm per room				66	33	66	200	200	150	132	400	132
Number of rooms required for new institution		A	Y	C=A	D=C/4	06	1	-	1	1	1	-
Total number of rooms		A	Y	C=AxY	D=C/4	06/Course*	1	2/Course (Max 4)	1	1	1	1

Where;

- Category X of courses: Mechanical, Production, Civil, Electrical, Chemical, Textile, Marine, Aeronautical and allied courses of each.
- Classrooms, Tutorial rooms and Laboratories required for 2nd, 3rd and 4th year may be added progressively to achieve total number as stated.
- Additional Library (Reading room) area of 50 sq m / per 60 student (UG+PG) intake beyond 420.
- #Progressive requirement, 2nd year onwards shall be calculated as 2+2 labs / course
- Round off fraction in calculation to the next integer.

b) Duration and Entry Level Qualifications for the Technical Program (Engineering and Technology Programs/ Degrees)

SN	Diploma/ Degree	Duration	Eligibility
1	Under graduate degree program (full time)	4 years	▶ Passed 10+2 examination with Physics and Mathematics as compulsory subjects along with one of the Chemistry / Biotechnology / Biology ▶ Obtained at least 50% marks (45% in case of candidate belonging to reserved category) in the above subjects taken together
2	Diploma Programs (full time)	3 / 4 years	▶ Passed 10 std. / SSC examination Obtained at least 35% marks at the qualifying examination
3	Post diploma programs	1.5 years/ 2 years	▶ Passed Diploma examination ▶ Obtained at least 50% marks (45% in case of candidate belonging to reserved category) at the qualifying examination.

c) Norms for Intake & Number of Courses / Divisions in the Technical Campus

Diploma/ Degree	Intake per division	Maximum Number of UG/PG courses and/ or divisions allowed in the new division (single shift working)	
		Divisions	Intake
Diploma/ Post diploma level	60	5	300
Undergraduate level	60	5	300
Post graduate degree and post graduate diploma level	18	6	108

New technical campus in Engineering and technology shall necessarily opt for courses from the following:

- Applied Electronics & Instrumentation
- Chemical Engineering/Technology
- Civil Engineering/Technology, Construction Engineering Computer Science, Computer Science and Engineering, Computer Science & Information Technology
- Computer Technology Electrical Engineering or Electrical & Electronics Engineering
- Electronics and Communication Engineering
- Information Technology
- Instrumentation and Control Engineering
- Mechanical Engineering
- Production Engineering

d) Norms for Essential and Desired requirements for Technical Campus (Marked as essential need to be made available at the time of the Expert committee visit)

SN	Details of requirement	Provisioning
1.	Language Laboratory The Language Laboratory is used for language tutorials. These are attended by students who voluntarily opt for Remedial English classes. Lessons and exercises are recorded on a weekly basis so that the students are exposed to a variety of listening and speaking drills.	Essential
2.	Potable Water supply and outlets for drinking water at strategic locations	Essential
3.	Electric Supply	Essential
4.	Backup Electric Supply	As required
5.	Sewage Disposal	Essential
6.	Telephone and FAX	Essential
7.	First Aid facility	Essential
8.	Vehicle Parking	Essential
9.	Institution web site	Essential
10.	Barrier Free Built Environment for disabled and elderly persons including availability of specially designed toilets for ladies and gents separately	Essential
11.	Safety provisions including fire and other calamities	Essential
12.	General Insurance provided for assets against fire, burglary and other calamities	Essential
13.	All weather approach road	Essential
14.	General Notice Board and Departmental Notice Boards	Essential
15.	Medical and Counselling Facilities	Essential
16.	Public announcement system at strategic locations for general announcements/paging and announcements in emergency.	Desired
17.	Enterprise Resource Planning (ERP) Software for Student-Institution-Parent interaction	Desired
18.	Transport	Desired
19.	Post, Banking Facility / ATM	Desired
20.	CCTV Security System	Desired
21.	LCD (or similar) projectors in classrooms	Desired
22.	Group Insurance to be provided for the employees	Desired

SN	Details of requirement	Provisioning
23.	Insurance for students	Desired
24.	Staff Quarters	Desired

e) Norms for Faculty requirements and Cadre Ratio for Technical campus

- Diploma

Diploma	Faculty: Student ratio	Principal/ Director	Head of the Department	Lecturer	Total
		A	B	C	D
Diploma/ Post diploma	1:20	1	1 per department	S/20	A+B+C

S = Sum of number of students as per Approved Student Strength at all years

- Degree

Degree	Faculty: Student ratio	Principal/ Director	Professor	Associate professor	Assistant professor	Total
		A	B	C	D	A+B+C+D
Undergraduate	1:15	1	(S/15 x R) - 1	(S/15 x R) x2	(S/15 x R) x6	S/15
Postgraduate	1:12	-	(S/12 x R)	(S/12 x R)	(S/12 x R)	S/12

Note:

For undergraduate: S = Sum of number of students as per Approved Student Strength at all years, R = (1+2+6)

For Postgraduate: S = Sum of number of students as per Approved Student Strength at all years *R = (1+2), $^{\#}$R = (1+2+6)

17.5. Minute of stakeholders meeting at Baddi

Date	21-23 May 2015	
Time	All day	
Location	Baddi, Nalagarh, Parwanoo, Una	
	Name	Designation
MSME-DI Personnel	Rajeev Kr. Dogra	Asst. Director
	Wazir Singh	Asst. Director
	Veer Singh Verma	Investigator
EY Personnel	Dinesh Kumar Pradhan Rajkumar Deegwal	Adviser Senior Consultant
Agenda	Discussion on the following points ► Overview of Baddi industry sector-wise ► Key requirements/ Challenges of Associations/MSMEs ► Manufacturing technologies ► Key skills ► Current trends ► Insights on potential sectors for growth in terms of production and training	

Sr. No.	Industry Representative		Key points discussed during the meeting
	Name	Designation	
Meetings at Baddi on 21 May 2015			
1	Mukesh Jain	Ridhi Packages Pvt. Ltd.	► 200-250 packaging firms are functional in Baddi ► Automobiles firms like Indo farm, TVS HMT, Sonalika etc. ► Significant no of packaging (plastic bottles, Jars, corrugated box) firms which mainly cater to FMCG and Pharmaceuticals industry. ► There is a significant demand of testing and calibration facility in Baddi. Some of the large units have in house facility for Chemical/mechanical tests and paper testing, the same facility is not accessible to most of the small firms. ► A packaging firm spends average Rs. 2 lacs per year on testing in Baddi. ► Honda, Renault and Maruti are planning to set up their plants in Una. ► Blow and injection moulding widely used in packaging industry. ► Availability of skilled manpower is one of the major challenges faced by the engineering units in Baddi. ► The Industry is transforming and switching to CNC from conventional
2	N. P. Kaushik	Managing Director, Cozy auto	
3	Sanjay Sharma	Sr. Manager, R&D, A.V. Auto Industries Pvt. Ltd.	
4	Anmol Rattan Sharma	Managing Director, Arynit Enterprises Pvt. Ltd.	

			machines but they face difficulties in finding the skilled manpower. ▶ Currently small firms have to outsource high end machining jobs to Ludhiana, Amritsar and outside Himachal. ▶ There is a significant demand for Heat treatment facility in Baddi. ▶ Metrology and calibration services in Baddi are substantially needed. ▶ There are about 60 small and 16 medium general engineering firms in Baddi. ▶ 4 forging units named S. R forge, Himteknoforge, Embros and Forge India are operational in Baddi area. ▶ There is significant no. of plastics processing units moulding items for FMCG like for Fridge, A.C., Coolers, Kitchen Machines etc. ▶ Plastic firms are suppliers to large firms like Voltas, maharaja, Blue Star etc. ▶ There are around 400 CNC machines available in Baddi region.
Meetings at Parwanoo and Baddi on 22 May 2015			
1	Anshul Dhiman	Dy. Director, Dept of Industries	1. Currently firms gets their plastic moulds either from Delhi Mumbai or Taiwan. 2. Though There is no cost advantage in getting the moulds from Taiwan but there is delivery and quality issues in procuring in India. 3. Electronics/ electrical equipment testing and calibration is required by the MSMEs. 4. Maintenance of electronics/electrical equipment (PCB and other equipment) can be an opportunity for the TC. 5. CIPET has already set up a facility in Baddi and training has been started. 6. Drug Testing lab is already proposed in Baddi for Pharma testing. 7. Followings are the area where TC can provide its service ▶ Testing and Calibration ▶ Repair and Maintenance ▶ Chemical Testing ▶ Repair and calibration of CNC card/parts ▶ Repair of motor drives ▶ Reverse Engineering ▶ Friction Welding 8. Tailor made short term training programs should be there for
2	Ketan Patel	Satwik Scales, Parwanoo	
3	Sailesh Aggrawal	Vice President, Barotiwala Baddi Nalagarh Industries Association (B.B.N.I.A.)	
4	R. L. Satya	Executive Officer, Barotiwala Baddi Nalagarh Industries Association (B.B.N.I.A.)	
5	K. K. Sharma	Vice President, Milestone Gears Private Limited	
6	J. R. Sharma	Director, Baddi Technical Training Institute	

			workers for skill upgradation
Meetings With Dy. Director Dept. of Industries, Himachal Pradesh on 22 May 2015			
1	Anshul Dhiman	Dy. Director Dept. of Industries	1. There has been a significant growth of MSMEs in Tahliwal and Mehatpur industrial areas near Una. 2. Auto parts manufacturers, food processing units and plastic manufacturers are in substantial number. 3. State government shall provide all kind of support for the TC.
Meetings at Nalagarh and Una on 23 May 2015			
1.	Ashok Rana	AMTEK Auto Limited, Nalagarh	1. Plastic pipe (HDP, PVC) manufacturers require testing facility. 2. There is a significant number of electronics/electrical wire and other product manufacturer in Mehatpur. 3. Electric Fan, CFL, invertor, stabilizer and cable are manufactured in Una. 4. Heat treatment facility with 7.5 feet long is required for Screw barrel. 5. Automobile (bus, Truck etc.) body building testing mandated by ARAI have to be carried out by the auto part manufacturers. 6. In order to provide wider support to MSMEs, The TC should keep the fee low or provide discounts and then gradually the same can be increased as soon as it has a significant customer base. 7. There is a great demand of testing and certification facility which can provide chemical testing for MSMEs product. MSMEs have to provide quality certificate for their product as the certificates are mandatory by CPSUs.
2.	Viresh Kaashyap	G. S. Mehutpur Industrial Association	
3.	Rohit Verma	Food technologist, HIMPA	
4.	Chaman Singh Kapoor	Director, Mayfair Biotech Pvt. Ltd.	
5.	Saurabh Gupta	Gupta Tubes	
6.	Ashwini Jain	Bansal Tubes	
7.	Baltej Singh	Plastic Pipe manufacturer	

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