



Draft Detailed Project Report

**New Technology Centre, Kanpur
(General Engineering)**

**Technology Centre Systems Program
(TCSP)**

Submitted

To

Report No: 2016-Delhi-0320

The Office of Development Commissioner - MSME
Ministry of MSME, Govt. of India
Maulana Azad Road, New Delhi -110108



EY

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26 September 2016
Director (Tool Room)
Office of Development Commissioner, MSME
Ministry of MSME
Nirman Bhawan, Maulana Azad Road,
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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 Kanpur, Uttar 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,



Amar Shankar, Partner - Advisory Services

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We also extend our sincere thanks to all the stakeholders such as large enterprises, 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 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
CFC	Common Facility Center
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
DMSRDE	Defence Materials and Stores Research and Development Establishment
EDM	Electrical Discharge Machining
ESDM	Electronics System Design And Manufacturing
ESTC	Electronics Service & Training Centre
FFDC	Fragrance & Flavour Development Centre
IDEMI	Institute For Design of Electrical Measuring Instruments
IDTR	Indo Danish Tool Room
IGTR	Indo German Tool Room
IISc	Indian Institute of Science
ITI	Industrial Training Institute
ITSP	IT Service Provider
KPI	Key Performance Indicator
LCA	Light Combat Aircraft
MOU	Memorandum of Understanding
MSME	Ministry of Micro, Small & Medium Enterprises
NCVT	National Council for Vocational Training
OEM	Original Equipment Manufacturer
PDO	Program Development Objective
PMU	Program Management Unit
PPDC	Process and Product Development Centre
TCs	Technology Centres
TCSP	Technology Centres Systems Programme
TDC	Technology Development Centre
TP	Technology Partner
TR	Tool Room
TRTC	Tool Room & Training Centre
UNIDO	United Nations Industrial Development Organization

Revision History

Version	Issue date	Amendment description	Prepared by	Reviewed by
1.1	22 August 2016	Financial Model draft	Tanvi Ratna	Rajkumar Deegwal Dinesh Pradhan
1.2	30 August 2016	Context section review	Tanvi Ratna	Dr. Milind Mujumdar
1.3	5 September 2016	DPR First draft review	Tanvi Ratna	Dr. Milind Mujumdar Dinesh Pradhan Rajkumar Deegwal
1.4	12 September 2016	Environmental and Social screening	Shubhra Aprajita Aliya Bhandari	Dr. Milind Mujumdar Dinesh Pradhan Rajkumar Deegwal Tanvi Ratna
1.5	13 September 2016	DPR Final draft review	Tanvi Ratna	Dr. Milind Mujumdar Dinesh Pradhan Rajkumar Deegwal
1.6	24 September 2016	Financial Model	Rajkumar Deegwal	Dr. Milind Mujumdar Dinesh Pradhan

Executive Summary

Objective of DPR: Evaluate the feasibility of the proposed Kanpur TC.

Key Components

- Opportunity and need assessment
- Social and Environmental assessment
- Technology & Skillset requirement
- Investment & Return

Opportunity and need assessment

Vendors serving large manufacturers in Kanpur and catchment area

- Aerospace:** Hindustan Aeronautics Limited
- Automotive:** Tata Motors
- Heavy Engineering:** Lohia Group, BHEL, Alstom T&D
- Defence:** Ordnance Factories such as Small Arms Factory, Field Gun Factory, Ordnance Equipment Factory,
- Textiles:** Reliance Industries
- Others: ALIMCO

Over 15,000 engineering-focused MSMEs in catchment area

Stakeholder discussions



Key Stakeholders

- O/o DC-MSME
- MSME-DI (Kanpur)
- OEMs, Tier I & II suppliers,
- Industrial Association
- Government Institutes
- MSMEs

Key Training Requirement

- Multi-skilled workforce
- Welders, CNC operators, Sheet metal workers
- Short-term trainings for vendors
- Business skills for vendors

Key Technology and Tooling Requirement

- Tools, Dies and Moulds
- Reverse engineering
- Heat Treatment
- Universal machining center
- Spare Parts manufacture

Financials

Total Capital Expenditure: INR 110.20 Cr

Training Machines: INR 25.88 Cr

Production Machines: INR 24.73 Cr

Building Infrastructure: INR 52.76 Cr

Other Infra. incl. Pre-Operative Expenses : INR 6.83 Cr

IRR: 9.0%

Positive income after depreciation is projected to be registered in 9th year

Location Overview



- In the vicinity of 5 National Highways (NH 2, 27, 146, 86, 91), Agra-Lucknow Expressway
- Close proximity to industrial corridors (EDFC, YEIDA)



- Very strong railways connectivity, Central Railways hub
- Good connectivity with other districts in UP, MP, NCR
- Kanpur Metro under development



- Nearest Airport at Lucknow (80kms)
- Kanpur Airport under development

Notable features of Kanpur



Formerly "Manchester of India," North India's largest industrial town



Sectorial shift from textiles -base to engineering. 6,000 of 20,000+ MSMEs cater to the engineering sector



TC centrally located in Kanpur town with good connectivity to neighboring states



Strong industry and infrastructure push around Kanpur from state government

Focus area of the Technology Centre

1

Training

56% of total revenue

- CNC Machining
- Advanced welding
- Tool Room courses
- Maintenance

2

Production

34% of total revenue

- Advanced welding techniques
- Welding automaton
- Reverse engineering Infrastructure
- Mold & Tool making
- Spare part manufacture

3

Consultancy

10% of total revenue

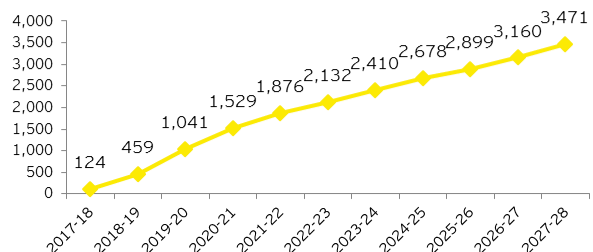
- Design Support
- Productivity improvement
- Support to training colleges

4

Other areas

- Productivity and Quality improvement
- TP and CNM support

Kanpur Revenue Projections (INR in Lacs)



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SECTION 1

CONTEXT

This section includes

- ▶ Introduction to the TCSP program
- ▶ Objective of the DPR
- ▶ Location Brief and Market Assessment

1 Context

India is one of the largest and most dynamic global economies. India's GDP in 2016 stands at over USD 2 trillion, making it the 7th largest economy in the world. 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. However, manufacturing constitutes a mere 16% of India's GDP, compared to over 30% in other Asian countries. Significant efforts are currently underway in the country to boost manufacturing.

POLICY EFFORTS AT BOOSTING MANUFACTURING

"Make in India" and the National Manufacturing Policy are significant policy efforts aimed at boosting Indian manufacturing sector. Some of the provisions of the NMP are as follows:



National Manufacturing Policy

- ▶ Increase manufacturing sector growth to 25% over the medium term to make it the engine of growth for the economy.
- ▶ 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.

India's manufacturing sector has been facing challenges, such as low value addition, low productivity, and low scale-up and clustering. Micro Small and Medium Enterprises play an essential role in the overall industrial economy of the country and account for over 45% of India's manufacturing output¹. However, this particular sector is challenges on multiple front: access to

¹ <http://www.dnb.co.in/Nashik2013/PDF/MSMEsInIndia.pdf>

finance, access to technology and skilled manpower, access to markets (domestic & export), infrastructure deficiencies.

In order to address multiple technical, skill and tooling challenges faced by MSMEs, the Ministry of MSME Government of India, established Tool Rooms and Training Centers starting in the year 1967. The primary focus of these organizations is to improve access to advanced technologies & provide technical advisory support to entrepreneurs and workers, as well as opportunities for technical skill development to the youth at varying levels.

At present, the Office of Development Commissioner [O/o DC (MSME)], Ministry of Micro, Small and Medium Enterprises, operates 10 Tool Rooms and 8 Technology Development Center (both hereinafter called as TCs) spread across the country. 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 provide technical and vocational training programs to more than 1,50,000 trainees annually. Some of these include training programs certified by the AICTE and NCVT. The TCs also provide design and manufacturing support to entrepreneurs alongside technical consultancies.

The list of the existing TCs along with their specializations is as follows:

TABLE 1: SUMMARY OF EXISTING TECHNOLOGY CENTRES

SN	Name	Focus Sector
1	Central Tool Room & Training Centre (CTTC), Bhubaneswar (Odisha)	General engineering (Precision components)
2	Indo Danish Tool Room (IDTR), Jamshedpur (Jharkhand)	General engineering (Auto components)
3	Central Tool Room & Training Centre (CTTC), Kolkata (West Bengal)	General engineering
4	Tool Room & Training Centre (TRTC), Guwahati (Assam)	General engineering (Training in tool making)
5	Indo German Tool Room (IGTR), Aurangabad (Maharashtra)	Auto & General engineering (Auto components)
6	Indo German Tool Room (IGTR), Indore (Madhya Pradesh)	General engineering (Auto & Pharma)
7	Indo German Tool Room (IGTR), Ahmedabad (Gujarat)	General engineering (Auto & Plastic tools)
8	Central Tool Room (CTR), Ludhiana (Punjab)	General engineering

SN	Name	Focus Sector
9	Central Institute of Hand Tools (CIHT), Jalandhar (Punjab)	General engineering (Hand tools)
10	Central Institute of Tool Design (CITD), Hyderabad, (Andhra Pradesh)	General engineering & ESDM
11	Institute for Design of Electrical Measuring Instruments (IDEMI), Mumbai, (Maharashtra)	ESDM and tool making
12	Electronics Service & Training Centre (ESTC), Ramnagar (Uttarakhand)	ESDM
13	Process and Product Development Centre (PPDC), Agra (Uttar Pradesh)	Foundry and forging
14	Process cum Product Development Centre (PPDC), Meerut (Uttar Pradesh)	Sports goods
15	Central Footwear Training Institute (CFTI), Agra (Uttar Pradesh)	Leather & footwear
16	Central Footwear Training Institute (CFTI), Chennai (Tamil Nadu)	Leather & footwear
17	Fragrance and Flavour Development Centre (FFDC), Kannauj (Uttar Pradesh)	Fragrance & flavours
18	Centre for Development of Glass Industries (CDGI), Firozabad (Uttar Pradesh)	Glassware

1.1 Understanding the Technology Centres Systems Program

The Technology Centres Systems Program is a USD 400 million pan-India program jointly funded by the World Bank and the Ministry of MSME, Government of India. It seeks to enhance the technological competencies and skill base of MSMEs in select manufacturing sectors by establishing upgraded and new Technology Centres (TCs, currently called TRs and TDCs). The TCs will have as their mission to improve the competitiveness of MSMEs across India - with a strong emphasis on low income states. As a part of the TCSP program 15 new such Technology Centres are being set up in different states across India and the existing 18 centres are being upgraded.

These TCs will provide 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 enhance the productivity of MSMEs by improving their access to technology and business advisory services as well as skilled workers through systems of financially sustainable TCs.

KEY SERVICES OFFERED BY TECHNOLOGY CENTERS

(Sample for a General Engineering TC)

► Design & Manufacturing

- Product Development
- Design & Manufacturing of tools, dies, moulds, precision tools
- Process Development & Improvement

► Skill Development

- Long & short term training programs in the areas of CAD, CAM, CNC, automation, additive manufacturing, mechatronics etc.
- Customised programs for industries
- Catering to student ranges from school drop outs to 10th/12th/ITI/diploma/degree holders

► Consultancy

- Process and Product Improvement
- Automation solutions
- Quality Systems support
- Turnkey assignments
- Course curriculum developments

The stakeholders in the TCSP program include beneficiaries, implementation partners and strategic collaborators. Beneficiaries include MSME Units, who would benefit from access to technology, trained manpower and consultancy services, as well as the larger manufacturers and skill seekers. Strategic collaborators include Industry Associations, Applied Research Institutes and Academic Institutes and Academics.

The implementation team comprises a Project Management Unit (PMU), pivotal to implementing the program, a Technology Partner (TP) firm who would study and upgrade the technologies at the TCs and a Cluster Network Manager (CNM) firm who would enhance market linkages and other economic development cooperation amongst key stakeholders. A web-based National Portal Service Provider (NPSP) would provide a digital connect between different stakeholders. A Construction Management Consultant (CMC) shall be responsible for design, supervision of work and final closure of construction works for the TC.

FIGURE 1: THE TCSP ECOSYSTEM

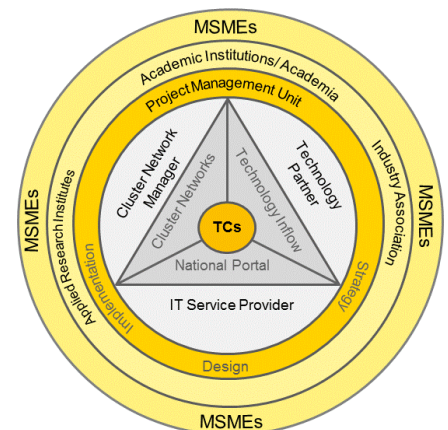
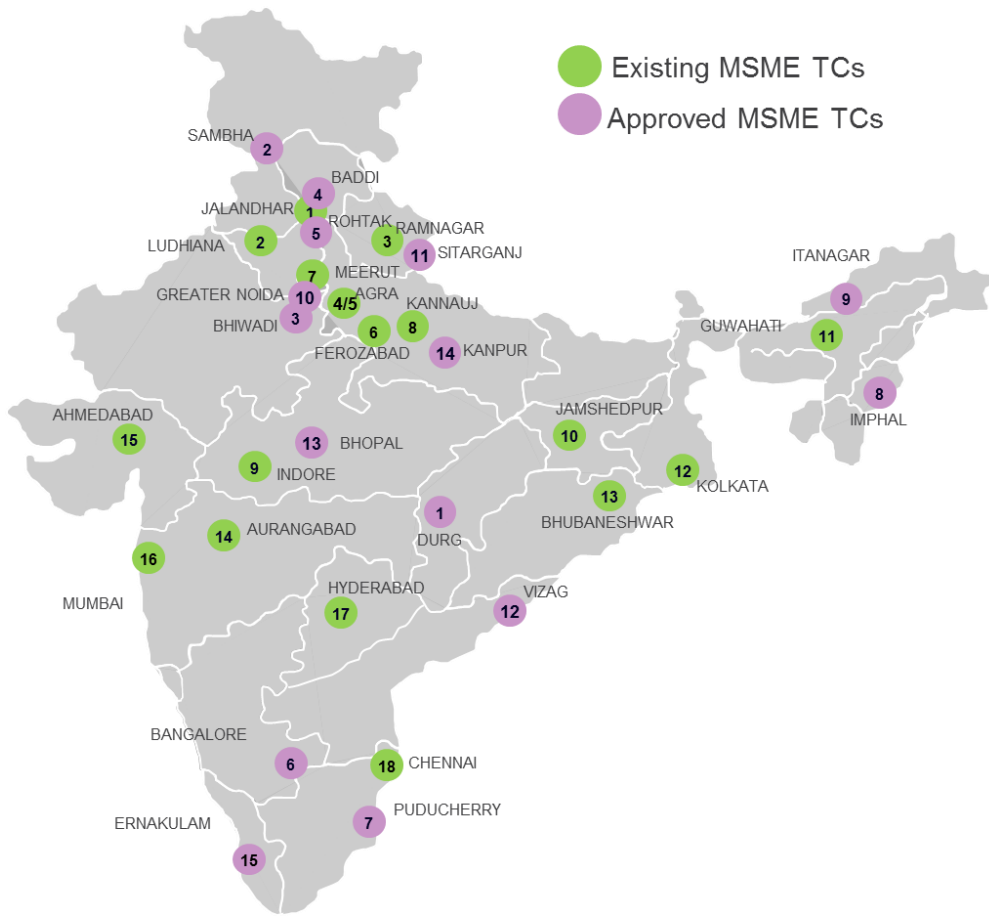


FIGURE 2: LOCATION OF ALL TECHNOLOGY CENTRES



1.2 Objective

The objective of this DPR is to evaluate the feasibility of the proposed Technology Center at Kanpur. This includes assessment of the market needs 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.

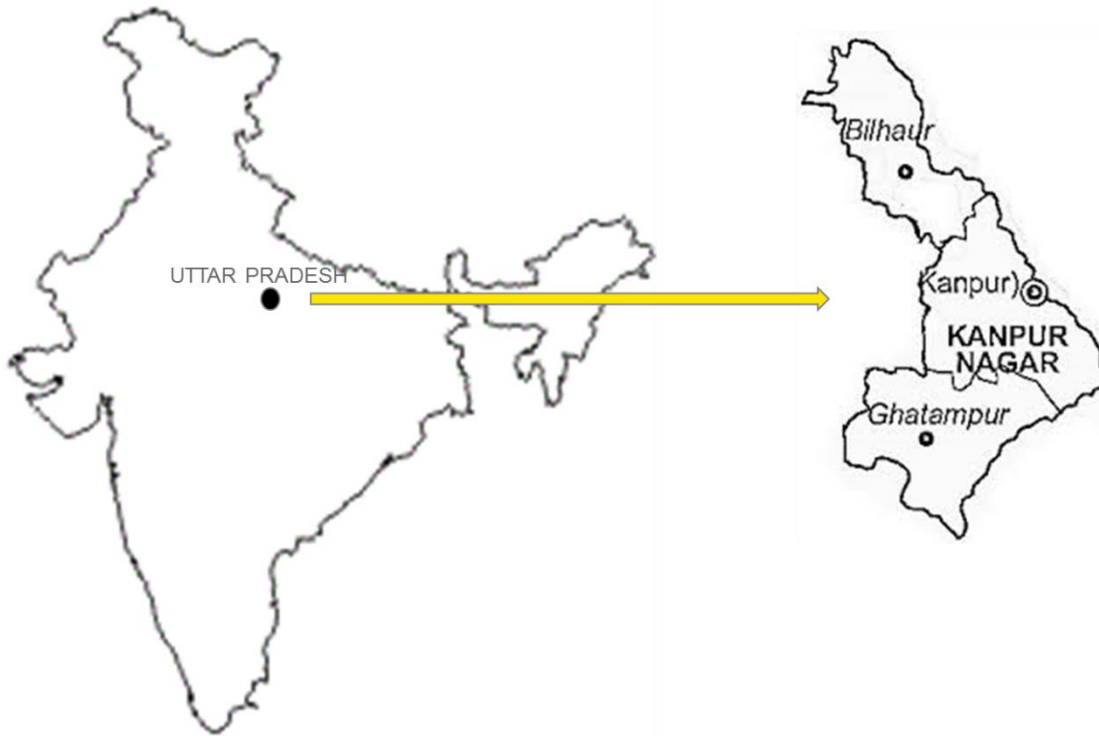
This DPR has been prepared in consultation with relevant stakeholders including O/o DC-MSME, the World Bank, OEMs, Tier I & II suppliers, industry associations, Government Institutes and some ancillary units in the area.

1.3 Regional Overview

Kanpur is located in the north Indian state of Uttar Pradesh. Kanpur city is the administrative headquarters of the district of Kanpur Nagar, a centrally located district in the Awadh region of Uttar Pradesh. It is the largest city in Uttar Pradesh and an important city nationally, being the 12th

most populous city in the country, having many technical universities and being an erstwhile leading industrial town in northern India. Kanpur town is located at 26.449923°N 80.331874°E. It is bound in the north by the Unnao district, to the east by the Fatehpur district, to the south by the district of Hamirpur and to the west by the district of Kanpur Dehat.

FIGURE 3: LOCATION OF THE KANPUR TECHNOLOGY CENTER



The nearest airport from Kanpur is about 80 kms away at Lucknow, Kanpur is very well connected by rail, and is home to one of the largest central railways stations within Kanpur town itself. Several national highways pass through Kanpur such as National Highways 2, 27, 146, 86, 91. Kanpur is 80 kms away from Lucknow and 495 kms away from Delhi. There are upcoming infrastructure plans for the city. Multiple highways and expressways are planned through or around the city. Feasibility studies for a metro have also been favourably concluded.

The Technology Center would be located in the area formerly occupied by Atherton Mills, which is centrally located in Kanpur town. Some of the large districts in the catchment area of the Kanpur Technology Center are Kanpur Nagar, Kanpur Dehat, Lucknow, Rae Bareilly, Allahabad, Jhansi in Uttar Pradesh and Gwalior, Satna, Bhind in Madhya Pradesh.

etc. Similarly, the Department of MSME and Export Promotion supports MSMEs in strengthening export competitiveness through facilitation forums, training, marketing support and other interventions.

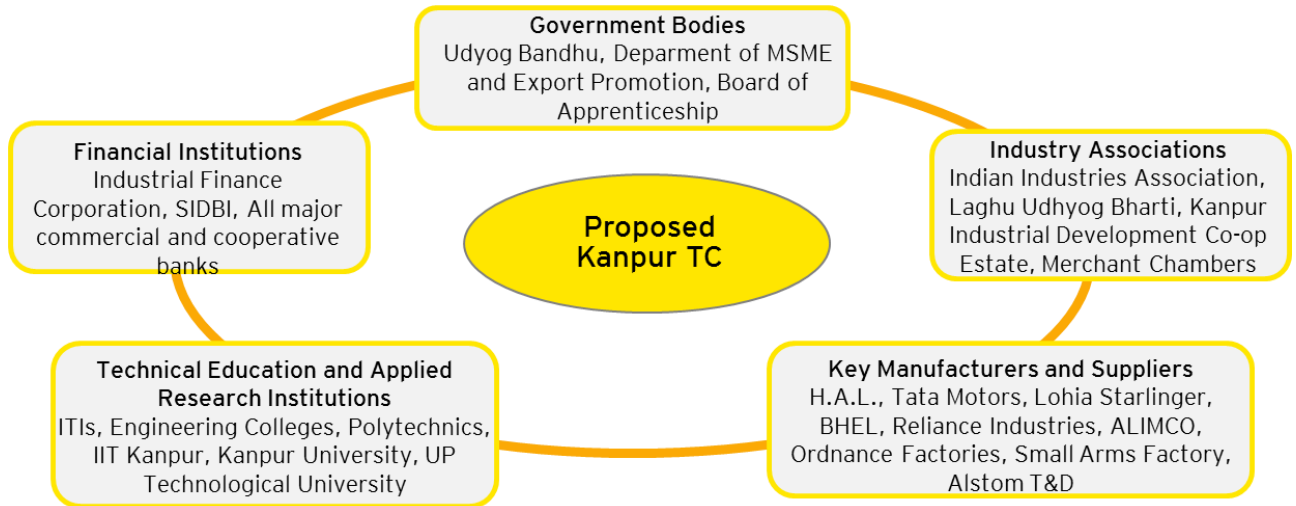


FIGURE 5: SUMMARY OF KEY STAKEHOLDERS FOR THE KANPUR TC

Industry Associations: Indian Industries Association is an apex representative body of MSMEs, with a membership base of about 5000 MSMEs. The association was founded in 1985, and has a network of over 40 chapters spread across most of the industrialized districts of UP and the surrounding regions. Laghu Udyog Bharti is a similarly large and active MSME association, with several thousand members. Both organizations work towards creating an environment conducive to industrial growth especially for MSMEs, disseminating valuable information on legal & technical aspects, latest development in industry and market, about latest Government policies, procedure and laws etc. apart from solving other problems of the Industry.

Technical Institutions: Uttar Pradesh has a total of 330 polytechnics, and 1500 ITIs (industrial training institute) / ITCs (industrial training centres). As mentioned earlier, Kanpur is home to some premier technical, engineering and research institutes in the country - IIT Kanpur, Harcourt Butler Technological Institute are leading engineering colleges, producing highly skilled graduates for the manufacturing sector. The CSA University of Agriculture, National Sugar Institute, Indian Institute of Pulses Research produce skilled graduates in agro-tech. Kanpur and its catchment area are also home to large ITIs such as Advanced Training Institute (ATI) Kanpur, Government Industrial Training Institute and others.

Key Manufacturers and suppliers: Given its strong industrial history, Kanpur has traditionally had a large manufacturing base. Even with the reduction in the size of the textile sector, several large

engineering and manufacturing firms dominate the industrial landscape of Kanpur and its catchment area. Hindustan Aeronautics Limited (HAL) has large manufacturing plants in both Kanpur and Lucknow. Tata Motors has a large and key manufacturing plant for heavy vehicles operating out of Lucknow. The Lohia Group is a leading global equipment manufacturer for plastic textiles, based out of Kanpur. Reliance Industries has its largest polyester yarn manufacturing plant at Barabanki. Kanpur is also a hub for Ordnance factories, with over ten such factories based there manufacturing a range of defence equipment.

Financial Institutions: Kanpur and Lucknow, the two largest cities of Uttar Pradesh form the core of the catchment area of the TC. Both have a strong presence of all leading commercial and cooperative banks. In addition, industrial finance leaders such as the Industrial Finance Corporation of India, Small Industries Development Bank of India (SIDBI) are all present in the region.

Overall, the regional stakeholder ecosystem is robust and when brought together with the TC, could significantly enhance the manufacturing competencies of the region,

1.5 Opportunity and Need Assessment

Once referred to as the “Manchester of India,” Kanpur is one of the largest industrial towns in Northern India. The large textile mills that Kanpur was famous for have since shut shop, however, Kanpur and its neighbouring districts are still home to several large industries and clusters. A high-level snapshot of the industrial scenario of Kanpur, is as follows:

TABLE 2: INDUSTRIAL SUMMARY OF KANPUR NAGAR

S. No.	Head	Data
1	Registered Industrial Units	17,444
2	Registered Medium and Large units	92
3	Estimated Average number of daily workers employed in small scale industries	74,980
4	Employment in large and medium industries	21,411
5	Number of industrial areas	10
6	Turnover of medium and large scale industries	INR 89,671 lakhs
7	Turnover of small scale industries	INR 251365 lakhs

Source: District Industrial Profile of Kanpur, MSME-DI Kanpur

While textiles were the earlier mainstay of Kanpur’s industrial landscape, the sectorial composition of firms has changed considerably and is now more tilted towards engineering firms, as displayed below:

TABLE 3: SECTORIAL PROFILE OF KANPUR INDUSTRIES

Type of Industry	Number of Units	Investment (INR Lakhs)	Employment
Repairing and Servicing	3,189	2121.65	8,630
Engineering Units	1,215	8294.76	7,266
Chemical/Chemical based	657	3920.29	4,232
Rubber, Plastic and Petro-based	611	9692.25	7143
Electrical Machinery & Transport Equipment	181	1576.43	1103
Metal Based (Steel fab.)	168	1013.86	752
Mineral based	141	1186.12	1,965

Source: District Industrial Profile of Kanpur, MSME-DI Kanpur

1.6 Assessing Industry Requirements in the Kanpur Catchment Area

Kanpur is an important revenue contributor to the Indian economy, designated as a “Town of Export Excellence,” and offers some of the following advantages:

- ▶ Kanpur enjoys good connectivity via road, railway and air. It is a major railway hub.
- ▶ Kanpur is centrally located in UP and offers accessibility to large markets within UP and its neighbouring states including Madhya Pradesh, Delhi NCR, West Bengal and Bihar.
- ▶ The city is home to some premier technical and research institutes in the country - IIT, HBTI, CSA University of Agriculture, National Sugar Institute, GSVM Medical College, Indian Institute of Pulses Research etc. It is also home to large ITI such as Advanced Training Institute (ATI) Kanpur, Government Industrial Training Institute.
- ▶ Due to a history of manufacturing there is an older generation of skilled manpower in the district, although some skill upgradation is necessary.
- ▶ Kanpur is home to 10 industrial areas, including Kalpi Estate, Uptron Estate, Chakeri and others, of which the Panki area is most developed, housing over a 1000 units.

The catchment area of the proposed Kanpur Technology Center extends for a 250 Km radius around the district and includes districts such as Kanpur, Kanpur Dehat and neighbouring districts such as Lucknow, Barabanki, Rae Bareilly, Jhansi and others, which are home to some large industrial units in defence manufacturing, aerospace engineering, automotive, general engineering, precision manufacturing, and textiles. Several large OEMs such as HAL, Tata Motors and others have been in the region for several decades and run major manufacturing and assembly units. A brief profile of key districts is provided below.

TABLE 4: INDUSTRIAL PROFILE OF THE KANPUR CATCHMENT AREA

Source: District Industrial Profiles, Ministry of MSME

S. No.	District Name (Total registered MSME units)	District summary	Large scale clusters	Key large manufacturers
1.	Kanpur Nagar (28365)	<p>Kanpur is home to several large industries and clusters in engineering goods, machines and machine tools, cement and fertilizer, ordnance, garments and leather and leather products. Engineering related industries comprised of the bulk of industry in the region and comprise engineering units, steel fabrication, electrical machinery and transport equipment, chemical and chemical based, rubber, plastic and petrol based industries and repair and servicing units. These comprise over 6000 MSME units and provide employment to over 31,000 people. Kanpur is home to large OEMs such as HAL and the Lohia Group.</p> <p>Kanpur is very famous for its large leather cluster. Together with the footwear cluster, the employment in these clusters is close to 1.5 lakh persons and the combined turnover is over Rs. 1300 crores. This is an export oriented cluster and has also won Kanpur the designation of "Town of Export Excellence" by the Government of India.</p> <p>The Panki industrial area is the largest in Kanpur.</p>	<ul style="list-style-type: none"> ▶ Machinery Parts ▶ Automobile Parts ▶ Plastic goods ▶ Leather & Leather products ▶ Saddlery ▶ Artificial jewellery and handicrafts 	<ul style="list-style-type: none"> ▶ Hindustan Aeronautics Limited (HAL) ▶ Artificial Limbs Manufacturing Company (ALIMCO) ▶ Kanpur Fertilizer and Cement ▶ Lohia Starlinger ▶ LML Scooters ▶ DRDO-DMSRDE ▶ Indian Ordnance Factories <ul style="list-style-type: none"> • Small Arms Factory • Ordnance Equipment factory • Ordnance Parachute Factory

2.	Kanpur Dehat (2,802)	<p>Kanpur Dehat is home to a few large OEMs, especially in the Jainpur area. However, local vendor development and ancillarisation of the large OEMs is low. The district does not have any major clusters in the manufacturing/engineering sector.</p> <p>Apart from agro-processing industries it is expected that Kanpur Dehat could potentially have clusters in electrical goods repair and maintenance and automobile repair.</p>		<ul style="list-style-type: none"> ▶ PepsiCo India ▶ Nerolac Paints ▶ Sparsh Industries (polyester film manufacturing)
3.	Lucknow (14253)	<p>Lucknow is the capital city of Uttar Pradesh and the second largest town after Kanpur.</p> <p>Engineering goods, especially for the automotive and aviation sectors are primary products. Tata Motors has a large plant based out of Lucknow that manufactures heavy vehicles and a set of ancillaries have developed around it, creating a successful cluster for the automotive sector.</p> <p>Lucknow is also famous for <i>Chikankari</i> work and has a large and export-oriented <i>Chikankari</i> cluster. This cluster employs 2 lakh workers and has a turnover of over 500 crores.</p> <p>Research Design and Standard Organization (RDSO) is also situated in Lucknow. RDSO is the sole R&D organisation of Indian Railways and functions as the technical advisor to Railway Board Zonal Railways and Production Units.</p>	<ul style="list-style-type: none"> ▶ Garments ▶ Automotive components/parts ▶ Chikankari Cluster ▶ Terracotta Cluster ▶ Plastic Industry Cluster ▶ Synthetic yarn, Herbal Products, Engineering goods 	<ul style="list-style-type: none"> ▶ H. A.L. ▶ N.T.P.C. ▶ Tata Motors Ltd. ▶ Omax Auto Ltd ▶ Samradhi Cement ▶ RDSO

4.	Allahabad (10,047)	<p>Allahabad is a town of historical significance in Uttar Pradesh and also a hub of large OEMs and PSUs.</p> <p>Allahabad has a high concentration of heavy engineering firms and ancillaries. Alstom, Schneider Electric, Bharat Pump and Compressor Ltd. and Reliance industries have large manufacturing units in Allahabad. Ancillarisation is high and there are a large number of MSMEs who are registered vendors of BPCL and Alstom. Around 4916 MSMEs are associated with the engineering sector.</p> <p>Allahabad enjoys several advantages. Location wise, it is well-connected with other industrial towns and cities in neighbouring states. There is no dearth of skilled as well as unskilled labour and professionally qualified personnel in the district. It is also a marketing centre for neighbouring districts of eastern Uttar Pradesh and northern Madhya Pradesh. There are 5 industrial parks in Allahabad, of which the one at Naini is significantly large.</p>	<p>Large OEMs and vendors but no cluster formation.</p> <p>Existing clusters are only in micro industries of carpets and leather goods.</p>	<ul style="list-style-type: none"> ▶ B.P.C.L. (Bharat Pump And Compressor Ltd.), Naini ▶ Reliance India Ltd., Naini ▶ Alstom T&D India Ltd., Naini ▶ Schneider Electric India Ltd., Naini
5.	Barabanki (11,423)	<p>Barabanki is a neighbouring district of Kanpur. It has a largely fragmented industrial landscape comprising agro-products, spinning mills and concrete manufacturers.</p> <p>However, it is home to one of Reliance Industries' largest plants producing black polyester yarn. In addition, it is also a major export hub for mentha producers.</p>	Mentha Crystals	Reliance Industries

6.	Jhansi (5459)	Jhansi is located close to the U.P. - M.P. border and is a large town of historical significance. It has a significant concentration of heavy engineering firms especially in transportation and power generation sectors. BHEL, Railway Coach Factory, Bharat Petroleum Corporation all have large plants operating out of Jhansi. Electric transformers are a key export product of Jhansi.	No major clusters	<ul style="list-style-type: none"> ▶ Bharat Heavy Electricals Ltd. ▶ Bharat Petroleum Corporation ▶ Railway Coach Factory ▶ Baidyanath Ayurvedic Pvt. Ltd. ▶ Diamond Cement Ltd. ▶ Parichha Thermal Power Project
7.	Bhind, Madhya Pradesh (10,425)	Bhind district of Madhya Pradesh is on the border with Uttar Pradesh, specifically with the districts of Agra, Etawah, Jalaun and Jhansi. It is home to a large industrial hub at Malanpur, housing several large private manufacturers. Engineering goods such as transformers, switch gears and motors are key products of these large units.	No major clusters	<ul style="list-style-type: none"> ▶ Cadbury Ltd. ▶ Godrej co. ▶ Crompton & Greaves ▶ Ranbaxy Ltd ▶ SRF Ltd. ▶ JK Tyres

1.7 Key Challenges Faced in the Region

The bulk of industries in the Kanpur catchment area are heavy engineering based, in the automotive, aerospace, equipment manufacturing and other sectors. Thus, the Technology Center has been premised with a General Engineering focus.

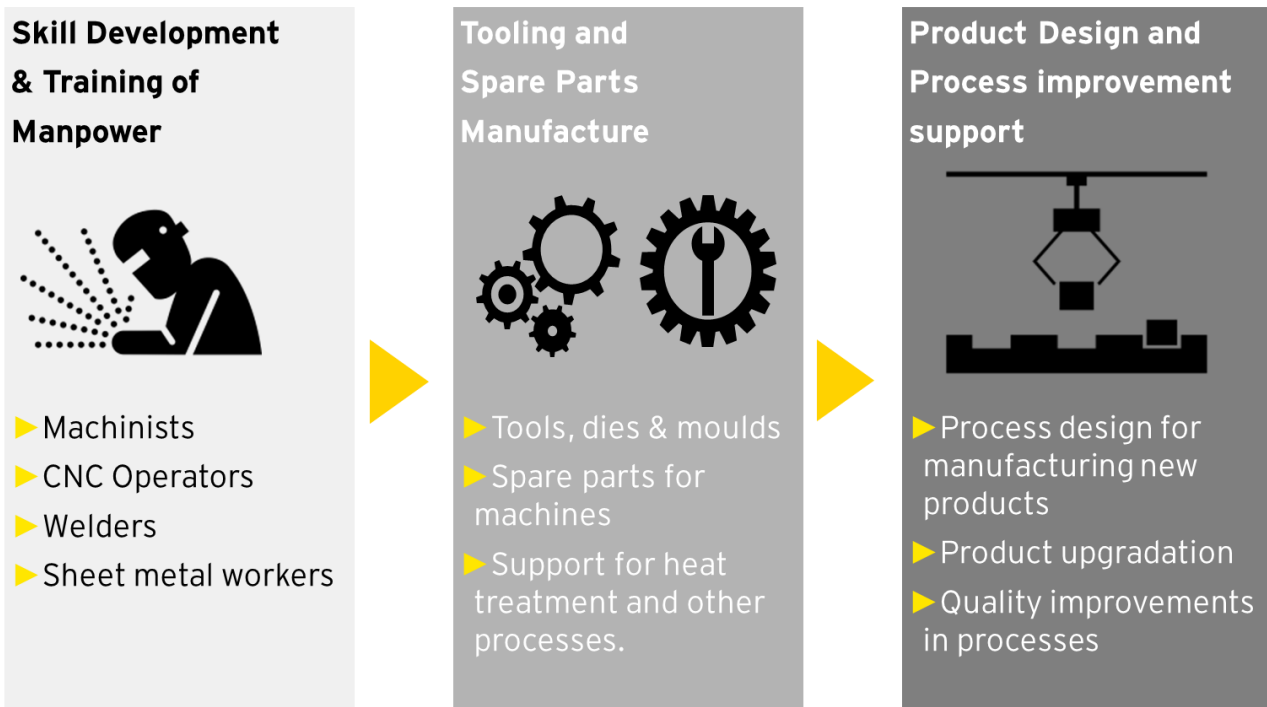
As part of preparing the DPR, discussions with some manufacturers and suppliers in Aerospace, Automobiles and General engineering sectors across the region as well as in other industrial agglomerations across India was carried out. The objective of the primary research was to

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' with respect to product design, training, manufacturing and consultancy.

In order to understand the industry requirements in the region, detailed primary and secondary research was conducted for the region with desktop research, site visits and stakeholder consultations with several large OEMs, MSME units, industry associations, training units and government bodies. Some of the key challenges faced by stakeholders in the region are as follows:

- ▶ **Shortage of tooling facilities:** ITTUP Lucknow, the only government tool room in the region has scaled down, and a few quality tool rooms exist but are nowhere near the capacity required to service the region. Units cite lead times of 6-8 months in procuring components from these tool rooms and are once again forced to rely on suppliers outside the catchment area and international suppliers.
- ▶ **Shortage of skilled manpower:** Although Kanpur is home to several high quality technical institutes, the local units are unable to retain talented graduates in the region. A large pool of graduates from ITIs and other institutes do not bring the quality skills required. Additionally, several OEMs that have existed in the region for decades are seeing large segments of their workforce retiring, without sufficient replacement.
- ▶ **Poor product quality of local vendors:** Although large OEMs outsource significant chunks of production, most of them are reliant on vendors outside the region ranging from far-off domestic locations such as Chennai to international suppliers in East Asia. Local vendors are either unavailable for high precision sectors or do not produce supplies of the required quality.
- ▶ **Poor technical and process quality of local vendors:** Local vendors have generally not upgraded to latest technologies and quality processes in their manufacturing. In addition, the business skills and other soft skills of local units are also weak.
- ▶ **Difficulty in procuring spare parts:** Several units which have upgraded to new or complex machinery face challenges in procuring spare parts and are often reliant on international suppliers for these components, significantly raising their costs and lead times.
- ▶ **Inability to identify and certify quality of products of local MSMEs:** The unavailability of product catalogues or lists of MSMEs in the region has made it difficult for some large OEMs to identify suitable MSME vendors. Additionally, there is no significant local infrastructure for testing/validation of input materials and products manufactured by MSMEs in the region.

TABLE 5: SUMMARY OF MARKET OPPORTUNITY FOR THE KANPUR TC



Sector	Units Benefited by Technology Center	Services Provided
General Engineering	MSMEs in the sector and vendors of ALIMCO, Lohia Starlinger, Small Arms Factory, Ordnance Equipment Factory (Kanpur), BHEL, BPCL (Jhansi), H.A.L. , NTPC (Lucknow).	Training, consultancy, tooling
Automotive	Automotive sector MSMEs such as vendors of Tata Motors (Lucknow)	Training, tooling
Transport	MSMEs in the sector and vendors of H.A.L. (Kanpur) Alstom T&D (Allahabad) Railway Coach Factory (Jhansi)	Training, consultancy, tooling
Textile	Textile-sector MSMEs and vendors of Reliance Industries (Barabanki and Allahabad)	Machine maintenance
Process Automation	Leather cluster (Kanpur) Chikankari cluster (Lucknow)	Process automation

1.8 Upcoming Industrial and Infrastructure Projects in the Kanpur Catchment Area

The Kanpur catchment area is receiving a big infrastructure push which could have transformational effects on its connectivity and access to new markets, vendors and suppliers. Some of the key projects are summarized below:

Eastern Dedicated Freight Corridors (EDFC) Project

- ▶ Industrial corridor on Eastern Dedicated Freight Corridor (EDFC) will have an expected investment of Approx. INR 42,000 Crore up to 2018
- ▶ Uttar Pradesh has highest share of around 57% (measuring 1,049 KM dissecting the state) in Eastern Dedicated Freight Corridor project
- ▶ 5% equity approved by the state government
- ▶ Two National Investment & Manufacturing Zones (NIMZs) and five Industrial Zones in the industrial corridor are in UP
- ▶ Proposed NIMZs include Auraiya National Investment & Manufacturing Zone (6,043 Hectare) and Jhansi National Investment & Manufacturing Zone (5,567 Hectare)
- ▶ EDFC shall facilitate uninterrupted transportation of goods to sea ports, Industrial Estates & Logistic Hubs along EDFC for the benefit of industries
- ▶ It shall reduce congestion at terminals and junction stations
- ▶ Five Industrial Zones have been proposed, viz:
 - Pashchimanchal Industrial Zone (2,000 Hectare)
 - Braj Industrial Zone(2,000 Hectare)
 - Kanpur Logistics hub (6,000 Hectare)
 - Allahabad-Naini-Bara Investment Zone (3,000 Hectare)
 - Mughalsari-Varansai-Mirjapur Investment Zone

Kanpur Metro Rail

- ▶ A rapid transit metro system is being developed in Kanpur City, which would later be expanded to the Kanpur Metropolitan Area
- ▶ Kanpur is the largest city in Uttar Pradesh and the metro system is expected to greatly improve connectivity across the city and its surrounding areas.
- ▶ The feasibility study and Detailed Project Report for the project were prepared in 2015 and it is expected that the project will be completed by 2020.
- ▶ Metro systems are simultaneously being planned in 4 cities in UP -Lucknow, Kanpur, Agra and Meerut. Ghaziabad and Noida/Greater Noida are already planned to be connected via the Delhi Metro.

Trans-Ganga Hi-Tech City

- ▶ The UP State Industrial Development Corporation has planned for the set-up of a Hi-Tech city halfway between Kanpur and Lucknow, at Unnao.
- ▶ It is envisaged as an industrial city, primarily housing green, non-polluting industries, that would attract talent from both Lucknow and Kanpur.
- ▶ A residential city is being created along with the residential town with schools, markets and other amenities close to workplaces in the industrial town.
- ▶ It is expected to generate employment for around 1 lakh people.

Agra-Lucknow Expressway

- ▶ India's longest expressway, the 302 km expressway linking Lucknow to Agra was built in a record 2 years with an investment of Rs. 13,200 crore by the UP government.
- ▶ It builds upon the Yamuna Expressway that connects the industrial hub of Greater Noida to Agra, and extends it all the way to Lucknow.
- ▶ The expressway opens up all of Central U.P. to a direct connection with Delhi NCR and adjoining industrial hubs
- ▶ It is expected to ease commerce for a variety of sectors ranging from industrial goods to agriculture, enabling producers in UP to sell at competitive rates to clients in Delhi NCR.
- ▶ It passes through the districts of Agra, Firozabad, Mainpuri, Etawah, Auraiya, Kannauj, Kanpur City, Unnao, Hardoi and Lucknow

Lucknow Ballia Expressway project (connects Barabanki, Faizabad)

- ▶ The Lucknow-Azamgarh-Ballia Expressway is a proposed 8-lane, divided and access-controlled highway, in India's Uttar Pradesh state.
- ▶ It will be 343 km long expressway and will connect Lucknow to Ballia by passing through Barabanki, Sultanpur, Faizabad, Ambedkar Nagar, Azamgarh, Mau and Ghazipur districts up to Ballia district.
- ▶ It would open up access to markets from Western UP to Bihar.

Saraswati Hi-Tech City, Allahabad

- ▶ This 1150 acre Hi-Tech city will be located close to the Naini Industrial Cluster in Allahabad.
- ▶ It will house modern residential facilities with school, markets, museums, libraries and other facilities.
- ▶ In a linked project, the state is also developing 580 additional acres in Naini into a larger industrial hub

SECTION 2

Implementation Plan

This section includes

- ▶ Human Resource Planning
- ▶ Planning for Production, Training and Consultancy Services
- ▶ Infrastructure Planning
- ▶ Marketing Plan
- ▶ Governance Model
- ▶ Permits and Clearances Required

2 Implementation Plan

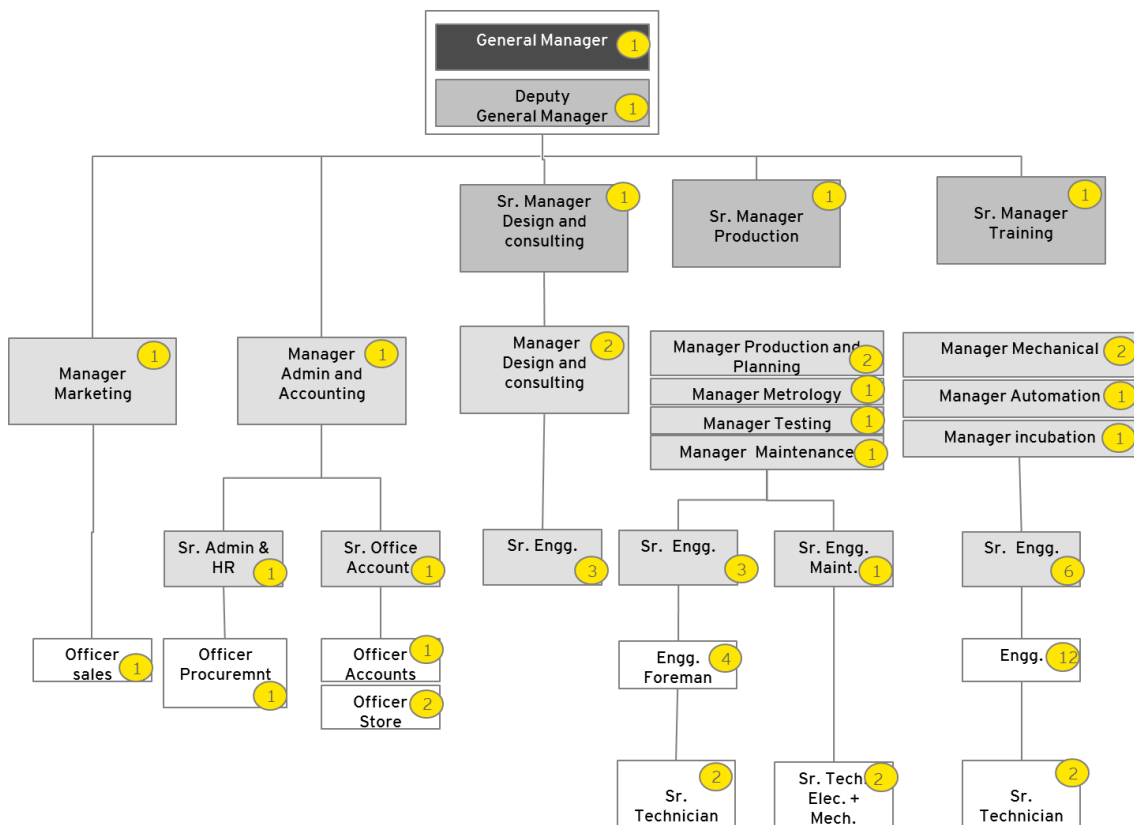
2.1 Manpower and Human Resource Planning

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

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

Based on our own research and design, as well as detailed consultations with some of the existing Technology Centres, o/o MSME-DC and other tool rooms, we have devised the following organizational structure for the Kanpur TC. The detailed Roles and Responsibilities are provided in Appendix 3.

FIGURE 6: ORGANIZATIONAL STRUCTURE



The following key considerations have been taken into account in devising this structure:

- ▶ The Empowered Finance Committee has mandated a total sanctioned strength of 60 for any new TC, in contrast to existing strengths of 110-120.
- ▶ Due to the 60 staff limit, we have proposed only 7 levels as compared 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 are clubbed into one.
- ▶ 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.
- ▶ In the proposed organizational structure for the Kanpur 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.
- ▶ To strengthen the key revenue arms of the TC - training and consultancy - a sanctioned strength of 7 experts has been provided, 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 a need basis.
- ▶ In contrast to existing TC, the marketing department has been reduced from 4-5 employees, 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 would strengthen the marketing activities of the proposed TC. Taking all the above factors into account, a lean marketing department has been proposed for the proposed Kanpur 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 incubation. Keeping in mind the scale and the emphasis to promote entrepreneurship, the manager incubation would mainly be responsible for administration, planning, quality control, issue of certificate to trainees, fee collection and others. Even one of the manager would be additionally responsible for organising workshops and providing other support services.
- ▶ While estimating the numbers we have considered the following factors:
 - 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 addition, 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 requirement of staff for the house-keeping and security will be outsourced to a third party agency on yearly contract basis

TABLE 6: 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		60²

² The details and basis of number of employees is provided in the next section

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.

2.2 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.

Year 2016-17: 2 Staff Members

- GM will be involved in project implementation and in working 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 2017-18: 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 Indore 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 2018-19: 42 Staff Members

- 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 2019-20: 52 Staff Members

The proposed TC would be fully operational by this period. 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.

2.3 Planning for Production, Training and Consultancy

The Kanpur TC would offer production, training and consultancy services linked to General Engineering. The details of these facilities are explained below.

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 the Technology Partner for finalisation and to initiate procurement. The budgetary cost (landed cost) of these machines is approximately estimated at around INR 24.73 Cr.

TABLE 7: PROPOSED LIST OF MACHINES AND EXPECTED REVENUE FOR PRODUCTION/ MANUFACTURING ACTIVITIES

Machine	Make	Suggestive Specs	Number	Value (lacs)	Total Cost	Estimated Machine Rate/Hour*	Shift	Hours	Revenue Capacity
CNC Milling-5axis	Foreign	0.6mx0.5mx0.5m	1	125	125	2000	3	24	48000
CNC VMC-3axis	Foreign	1.6mx0.9mx0.9m	1	100	100	1500	3	24	36000
CNC VMC-3axis(2)	Foreign	0.8mx0.6mx0.5m	2	75	150	1000	3	24	48000
CNC Horizontal Machining Centre	Foreign	1.0mx0.6mx0.6m	1	150	150	1500	3	24	36000
CNC Milling-3 Axis (Pattern Making)*	Indigenous	1.0mx0.6mx0.6m	1	50	50	800	3	24	19200
CNC Turn Mill Centre	Foreign	Dia 250x600	1	50	50	800	3	24	19200
Additive Manufacturing/3D printing/RPT - Polymer	Foreign	Polymer (300x300)	1	250	250	1500	2	16	24000
Conventional Milling	Indigenous	1200*300*400	2	25	50	250	3	24	12000
Conventional Lathe	Indigenous	400*1200	2	20	40	200	3	24	9600
CNC Wire EDM	Foreign	500*500*400 mm	1	100	100	1500	3	24	36000
CNC EDM Die Sinking	Indigenous	500*500*400 mm	1	100	100	1000	3	24	24000

Technology Centre Systems Program - Draft DPR for New TC at Kanpur

Radial drill machine	Indigenous	63mm	1	10	10	150	2	2	300
Surface Grinding Large	Indigenous	1000x600 mm	1	50	50	500	2	8	4000
Surface Grinding	Indigenous	600x400 mm	2	30	60	400	2	8	6400
Cylindrical Grinding	Indigenous	Dia 200x750mm	2	40	80	400	2	16	12800
Toolings & Tooling Systems (@ 10% of machine value)	Foreign				91	0	2	0	0
Injection Moulding machine	Indigenous	100 Tonne	1	50	50	800	2	16	12000
Hydraulic press	Indigenous	100 Tonne	1	50	50	800	1	8	6400
Mechanical press	Indigenous	100 Tonne	1	40	40	600	1	8	4800
Work Benches with Bench Vices & Assembly Kits	Indigenous		10	1	10	0	2	0	0
Auxiliary Equipment (Drill m/c, pedestal grinder, trollies etc.)	Indigenous		1	20	20	0	2	0	0
Material. Handling Equipment.- EoT 5T, Jib Crane 2T (2 nos.), Trollies	Indigenous	1 nos. EoT Crane (5 Tonne) & 2 nos. Jib Crane (2 Tonne each)	1	100	100	0	2	0	0
CNC CMM	Foreign	800mmx600 mm	1	100	100	1000	2	16	16000
Metrology Lab Equipment	Indigenous		1	100	100	800	2	16	12800
CAD/CAM Software CATIA, UG etc	Indigenous		5	3	15	500	2	16	40000
Vacuum HT Plant, Aux. Equipment & Metallurgy Testing Lab	Indigenous	Dia. 600x800 mm	1	200	200	3120000	2	1	3120000
Chemical and Metallurgical Test labs	Indigenous		1	200	200	2000	2	16	32000
Scanning/Drafting/Printing	Indigenous		1	5	5	0	2	0	0
CAD-CAM Workstations	Indigenous		10	1	10	0	2	0	0
Subtotal					2356				
Contingency @ 5%	Indigenous				117.775			0	0
Total					2473.28				

Training

The TC at Kanpur will provide professional training in various courses with focus on general engineering. 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, Training on Testing, etc. The batch sizes, number of batches per annum and respective fees have been decided on the basis of capacity of existing TCs and NCVT norms. 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 detail of courses in various specialisations is given below:

TABLE 8: DETAILS OF SPECIALISATION, COURSES, DURATION AND CAPACITY INTAKE AND REVENUE

No.	Trade	Course name	FT/PT	Duration (months)	Fee/student (INR)	Yearly Revenue per student	Batch size	No. of Batch/year
1	Tool Room	Advanced Diploma in Tool & Die making	FT	48	1,40,000	35000	60	1
		Certificate course in Machinist	FT	24	40,000	20000	30	1
		Post Diploma in Tool Design & CAD CAM	FT	12	50000	50000	30	2
		PG in Tool Design & CAD CAM	FT	18	105000	60000	30	2
		Post Diploma in Tool Design & CAD CAM	FT	12	50000	50000	30	2
		Post Diploma in Tool and Die Manufacturing	FT	12	50000	50000	30	2
		Post Diploma in CNC-Programing & Operation	FT	12	25000	35000	30	2
		Post Diploma CAE (manufacturing)	FT	12	60000	60000	30	2
		Adv. Certificate Course in Tool Design & CAD/CAM	FT	12	60000	60000	30	2
		Adv. Certificate Course Tool & Die Manufacturing	FT	12	60000	60000	30	2
		Certificate Course in Tool & Die Making	FT	12	40000	40000	20	2
		Master Certificate Course in Tool Design	FT	6	40000	40000	30	2

No.	Trade	Course name	FT/PT	Duration (months)	Fee/student (INR)	Yearly Revenue per student	Batch size	No. of Batch/year
		Certificate Course in Machine Tool Operations (Conventional L,M,G)	FT	12	30000	30000	30	2
		Master of CAD/CAM/CNC	FT	6	20000	20000	30	6
2	Maintenance	Certificate Course in CNC Machine Maintenance	FT	12	30000	30000	30	4
		Machine Maintenance-mech	FT	3	10000	10000	20	4
		Maint. Technician	FT	3	10000	10000	20	4
		Machine Maintenance-mech (Part Time)	PT	6	18000	18000	20	2
		Maint. Technician (Part Time)	PT	6	12000	12000	20	2
3	CNC Manufacturing/ CAD/ CAM	Adv. Certificate Course CNC Machining (L,M,WC,EDM)	FT	12	60000	60000	30	2
		Certificate Course CNC Machining (Turn & Milling)	FT	12	40000	40000	20	2
		Certificate Course in Metrology & QC	FT	12	30000	30000	30	4
		Master Certificate Course in Computer Aided Tool Engineering	FT	6	40000	40000	30	6
		CNC lathe programming and operation (Full Time)	FT	2	9000	9000	30	12
		CNC lathe programming and operation (Part Time)	PT	4	10000	10000	30	12
		CNC Milling Prog and Operation (Full Time)	FT	2	10000	10000	30	12
		CNC Milling Prog and Operation (Part Time)	PT	4	10000	10000	30	12
		CAD/CAM/CNC ENGINEER (Full Time)	FT	2	10000	10000	30	12
		CAD/CAM/CNC ENGINEER (Part Time)	PT	4	12000	12000	30	6
		CAD Modelling with different softwares (Full Time)	FT	1	6000	6000	30	24

No.	Trade	Course name	FT/PT	Duration (months)	Fee/student (INR)	Yearly Revenue per student	Batch size	No. of Batch/year
		CAD Modelling with different softwares (Part Time)	PT	2	7000	7000	30	24
		Computer Integrated Manufacturing (CIM)	FT	1	7000	7000	30	24
4	Advance Welding	Basic Arc and Gas welding (Full Time)	FT	3	10000	10000	20	4
		Basic Arc and Gas welding (Part Time)	PT	6	12000	12000	20	4
		TIG welding (Full Time)	FT	1.5	6000	6000	10	4
		TIG welding (Part Time)	PT	3	6000	6000	10	8
		MiG welding (Full Time)	FT	1.5	6000	6000	10	8
		MiG welding (Part Time)	PT	3	6000	6000	10	8
		Spot Welding (Full Time)	FT	1.5	8000	8000	10	4
		Spot Welding (Part Time)	PT	3	8000	8000	10	4
				0				
5	Electronics and IT (Part Time Courses)	Basic computer and Hardware (Part Time - 4 hrs)	PT	2	8000	8000	20	20
		Advanced Hardware & Networking (Part Time - 4 hrs)	PT	4	12000	12000	20	10
		Solar energy system technician	FT	3	8000	8000	12	4
7	Industrial and process Automation	Industrial Hydraulics	FT	1	6000	6000	20	12
		Industrial pneumatics	FT	1	6000	6000	20	12
		PLC Programming	FT	1	6000	6000	20	12
		Automation Technician	FT	4	12000	12000	20	3
		Industrial automation design	FT	4	15000	15000	20	3
		Post Diploma in Mechatronics	FT	12	60000	60000	30	2
		Diploma in Mechatronics	FT	36	120000	40000	30	1

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 25.88 Cr. The following table provides the details of the same:

TABLE 9: PROPOSED LIST OF MACHINES FOR TRAINING AND ASSOCIATED COSTS

S.No.	Training Machines	Nos	Value (lakhs)	Total
1.	Conventional Milling-V-H-U	15	10	150
2.	CNC Machining centre	1	50	50
3.	Conventional Lathe	15	5	75
4.	Surface Grinding	10	5	50
5.	Cylindrical grinding	5	10	50
6.	Pedestal Grinding	10	1	10
7.	Drilling Machines	10	1	10
8.	Tool & Cutter Grinder	1	20	20
9.	Work benches and Kits	30	0.5	15
10.	CNC-Milling	15	30	450
11.	CNC-Lathe	15	20	300
12.	Wire EDM	1	25	25
13.	EDM Die Sinking	1	40	40
14.	Tooling and Tooling Systems (Cost @10% of machines)	@10%		114.5
15.	Maintenance Lab	1	50	50
16.	CNC Milling & Lathe Simulation Modules	30	2	60
17.	Computers for Computer Labs	400	0.5	200
18.	CAD/CAM software Licence	200	0.5	100
19.	Metrology lab equipment	1	100	100
20.	Solar Energy Lab	1	30	30
21.	Welding workshop	1	200	200
22.	Basic Instrumentation Lab	1	25	25
23.	Automation Lab for 20	1 set	200	200
24.	Teaching aids (Audio Visual)	20	1	20
25.	Teaching aids (Smart Board)	10	1 lot	10
26.	Furniture for labs	30	1 lot	30
27.	IT Hardware & Networking labs (2 labs)	2	20	40
28.	Classroom Furniture @ 60 seats	8	5	40
29.	Misc, Unforeseen & Contingency 5%			123.225
Total				2587.725

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 Kanpur TC would have a dedicated professional wing, staffed by skilled professionals, 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

The designing and consulting department will be equipped with high-end workstations, CAD/ CAM software, analysis software and 3D printing. 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.

TABLE 10: PROPOSED AREAS OF CONSULTING

Consulting Stream	Focus Area (Recommended)
Design Support (incl. Product Design)	<ul style="list-style-type: none"> ▶ 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	<ul style="list-style-type: none"> ▶ 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	<ul style="list-style-type: none"> ▶ Supporting MSMEs in establishing quality systems, quality improvement and acquiring necessary certifications
Project Consultancy (curriculum develop, community colleges, trainers etc.)	<ul style="list-style-type: none"> ▶ 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 Improvement	<ul style="list-style-type: none"> ▶ To handhold MSMEs in improving productivity on a long term basis (1-3 years) on a membership basis
Low cost Automation Solution support	<ul style="list-style-type: none"> ▶ Solutions to automate process for increasing efficiency at various stages of manufacturing

The table below represents the projected revenue estimates for 10 years for consulting services for the proposed TC. The revenue estimation has been done using the average project revenue of INR 50,000 per project.

TABLE 11: AREAS OF CONSULTING AND ESTIMATED REVENUE

S. No.	Consulting Areas	Year 1	Suggestive Rev Year2	Suggestive Rev Year3	Suggestive Rev Year4	Suggestive Rev Year5 (growth at	Year 6	Year 7	Year 8	Year 9	Year 10
1.	Design Support (incl. Product Design)	4	6	9	14	20	30	46	68	103	154
2.	Engineering Solutions (Development of Jigs & Fixtures for Machining, Welding etc.	1.00	1.50	2.50	3.50	5.00	8.00	12.00	17.00	26.00	38.50
3.	Quality System Support	1.00	1.50	2.50	3.50	5.00	8.00	12.00	17.00	26.00	38.50
4.	Project Consultancy (curriculum development, community colleges, trainers etc.)	-	2.00	3.00	4.50	6.75	10.13	15.19	22.78	34.17	51.26
5.	Low cost Automation Solution support	-	1.00	1.50	2.25	3.38	5.06	7.59	11.39	17.09	25.63
6.	Productivity Improvement	-	1.00	1.50	2.25	3.38	5.06	7.59	11.39	17.09	25.63
Total Revenue (INR Lakhs)		6.00	13.00	20.00	29.50	43.75	66.63	99.94	147.91	222.86	333.28

2.4 Support for the Textile Industry

The land for the Kanpur TC has graciously been provided to the Ministry of MSME by the National Textile Corporation (NTC). Given Kanpur's special status as the erstwhile, "Manchester of India," the TC would offer support to the Textile sector in all its general engineering needs. Four such key categories of services are estimated, based upon primary research data from the textile sector:

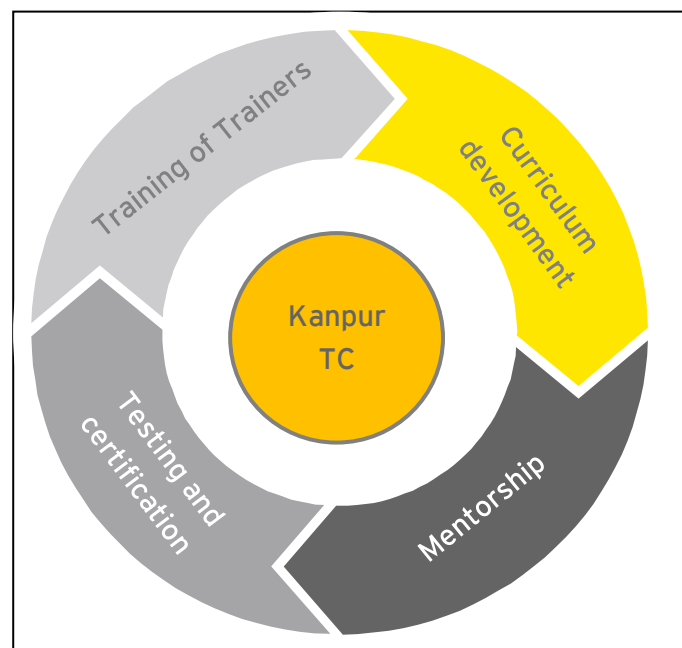
- a. **Repair and servicing of machines:** The Textile sector of Kanpur was established many decades ago, however, some old machinery still remains, requiring regular repairs. Most units have now upgraded to new technologies which are often imported. However, without skilled repair technicians and mechanics, they face challenges in repair and maintenance of machines. The TC would support the industry in meeting these requirements.
- b. **Spare parts manufacture:** In the process of upgradation of machines, most units have relied on international imports. This results in a challenge in procuring spare parts when required, as they are limited local suppliers. Relying on international spares leads to both time and cost overruns for the small firms. The TC's production unit could support the industry in manufacturing spare parts for sophisticated machinery.
- c. **Training for machinists:** Another aspect to the process upgradation undertaken by many units is the absence of skilled manpower to operate these units. While the General Engineering TC would not have the skill base to offer textile-based training, it would offer a variety of machinist and machine maintenance courses that could support the Textile industry.
- d. **Automation of processes:** The catchment area of the Kanpur TC is home to several textile-linked clusters such as the Chikankari cluster of Lucknow, the Zari-Zardozi cluster of Bareilly, the leather wear cluster of Kanpur and others. These are largely premised on manual processes. The TC could support the clusters in introducing a degree of process automation in order to help them boost productivity and profits.

2.5 Centre of Excellence for Manufacturing Skill Development

Uttar Pradesh represents a key industrial hub of the country with significant presence of large and medium OEMs. In order to supply skilled manpower to this hub and other states, The TC is going to play a vital role. It shall work as a nodal skill development centre. It shall not only provide advanced training in manufacturing technology but also work as a key facilitator for existing ITIs and polytechnic institutions in the catchment area. The following services shall be provided by the TC in order to increase competitiveness of ITIs and Polytechnic institutions.

- ▶ **Curriculum Development Support:** The TC shall assess curriculum of these institutions and provide support in developing modular training program which are latest and high on demand by the local industry. Based on the assessment of utilization of the existing infrastructure, the TC shall advise new courses for the institute.
- ▶ **Mentorship for new institution:** The TC shall work as a mentor and provide support in setting up new ITI and small skill development sector in manufacturing field.
- ▶ **Testing and certification of the skill:** The TC will work as a nodal organization to provide common platform to test and certify the skill level of the trainees.
- ▶ **Training of Trainers:** The TC shall provide access to new and advanced technology for the trainers of these institutions and shall provide necessary training to upgrade their skill set.

FIGURE 7: SUPPORT FOR OTHER TRAINING INSTITUTIONS



2.6 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.

2.7 Technology Collaboration

The TC at Kanpur 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 labour 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.

2.8 Technology Information Centre

Access to information is important. People need information to develop their potential through education and training, to succeed in business, to enrich their technological knowledge. Information is a key contributor for the development of new technology or a product.

The Technology Information Centre (TIC) will provide access to latest books, journals, engineering standards etc. to the MSMEs and students at an affordable cost. This will help the MSMEs in enhancing their knowledge and using latest standards for the development of products. Apart from books, journals etc., the TIC would also have Audio Visual rooms where students can go and learn about latest courses available. The TIC will have audio visual courses as per the requirement of industry in catchment area. The courses will cover areas like principles of electric drives, product design, product validation etc.

2.9 Incubation Centre

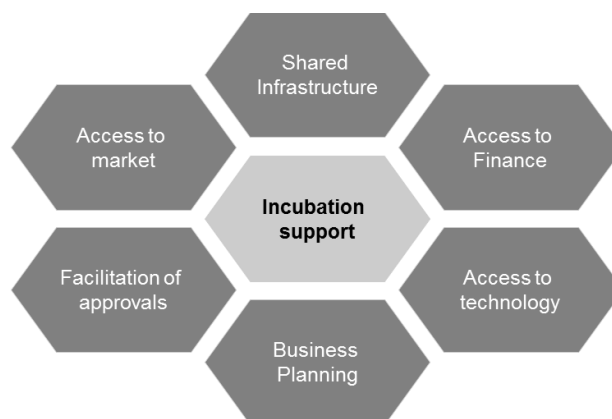
Promoting emerging technological and knowledge-based innovative ventures that seek to nurture ideas from professionals is important for development MSMEs. Such entrepreneurial ideas need to

be fostered and developed in a supportive environment before they become financially sustainable or attractive enough for venture capital. Hence need arises for incubation centres to promote budding individual innovators and to assist them to become technology based entrepreneurs. Typical areas of Incubation support include

- Idea conceptualisation & business planning - Technology commercialization,
- Access to infrastructure - networking, office space
- Access to finance - bank loans, loan funds, guarantee programs, investors
- Access to technology - access to machines, designing support
- Access to market - Introduction to strategic partners
- Facilitation of approvals - regulatory compliances, clearances

The incubation centre may also provide support to promote networking and forging of linkages with other constituents of the innovation chain for commercialization of their developments.

FIGURE 8: KEY AREAS OF INCUBATION SUPPORT



Typically the incubation support initiatives provide support to new businesses for an initial period of 2-4 years.

Business incubators differ from traditional research and technology parks in terms of scale and assistance. Research and technology parks are typically large-scale projects that house corporates, government companies or university labs to very small companies. Typically research and technology parks do not provide business assistance services, which are the hallmark of business incubators. However, research and technology parks may house incubation programs.

Several initiatives in this direction of incubation have been taken by various departments of Central Government. Some of them include

- ▶ **Incubators scheme for MSMEs- A component of National Manufacturing Competitiveness programme to improve competitiveness of MSMEs (MoMSME)**

The term 'innovation' covers a very wide domain. According to MoMSME, innovation signifies any activity and new/ ingenious procedure or product that is likely to be of use to

society and marketable in the long run. The scheme seeks to provide small dose of assistance, to students/ ex-students of science and technology and entrepreneurs to try out their innovative ideas (new processes/ products) at the laboratory or workshop stage and beyond (to the extent possible) with an objective to carry the idea from concept stage to 'know-how' stage and then to 'do how' stage.

▶ **Technology Business Incubator (TBI), Department of Science & Technology, (MoST)**

TBI is a flagship programme of National Science and Technology Entrepreneurship Development Board (NSTEDB) and focuses on incubation of potential ideas and innovations through a well-defined venture/ enterprise creation process and by effectively utilizing the requisite expertise, facilities and other infrastructure available within the host institution and the adjoining region. The incubation period is expected to be 2-3 years. Key areas of assistance in the TBI scheme include:

- Market survey/ marketing,
- Business planning and training,
- Organising management/ technical assistance,
- Obtaining statutory approvals,
- Information dissemination on product ideas/technologies,
- Syndicating finances,
- Arranging legal and IPR services,
- Provision of work space, shared service facilities

The proposed MSME technology centre at Kanpur will house incubation facilities to promote new entrepreneurs and MSMEs in the catchment area.

Incubation Centre at Kanpur TC

Kanpur TC will provide space for new age entrepreneurs and young minds to transform their innovative ideas into viable business propositions. The major role of TC will be to facilitate a platform for a budding entrepreneur to start a business venture with minimum risks. Kanpur TC will ensure that incubates have access to technological assistance which will be generated through mentors with multidisciplinary expertise. Young enthusiasts with creative pursuits with an inherent zeal to be entrepreneurs will be encouraged to take advantage of this novel initiative. Kanpur TC will facilitate interdisciplinary research with special emphasis on development and innovation of high-growth- knowledge-based-business and nurtures the indigenous products. Technical support, business mentoring, space availability and soft loan facility subject to availability will be the key services of the TC.

The incubation centre proposed at the Kanpur TC will offer the basic shell infrastructure with area ranging from 40-60 square-meter and latest technologies, world class manufacturing plant and machinery on rental basis for a 2 year period. This incubation centre is expected to fuel the growth of enterprise which has successfully crossed the stage of pilot order and ready to execute larger orders. The incubation centre would support entrepreneurs to develop end products for commercialization. The incubation centre would comprise of the following facilities:

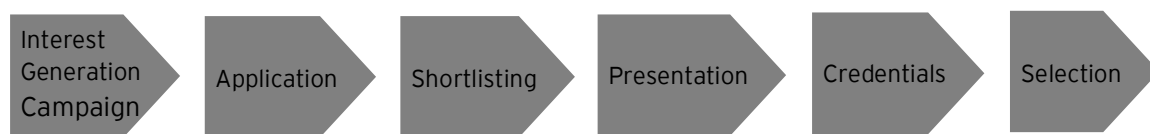
- a) Shell infrastructure for setting up an manufacturing facility with space between 20-40 square meter
- b) Support business facilities like office space, conference rooms, reception area etc.
- c) Business support: provides assistance in company formation, provides assistance for regulatory clearances, vetting business plans, etc.
- d) Technical support: the incubatee companies are provided with support of machineries, testing and calibration equipment, product assessment facilities and mentors for technical support.
- e) Financial support: the mic will provide financial support to the incubatee companies in the form of soft loan with minimum simple interest, from the funding agencies.
- f) Legal support: the incubatee companies would also be assisted in filling patent, patent harnessing as and when required on chargeable basis.
- g) Networking: the mic will provide networking with domains experts, consultants, venture capitalist and other funding agencies.
- h) It support services like internet, video conferencing, Wi-Fi etc.
- i) Electricity and power connection with sub-meters
- j) Registrations and clearances for setting of a manufacturing unit such as environmental clearances, fire safety, license for running a factory, registration for commercial establishment etc.

No common plant and machinery has been planned for the first phase of the TC. The technology partner will assess the required common equipment than can be purchased by the TC and offered to MSMEs on rent. This will also be driven by the need of the entrepreneurs and will become a part of the incubation centre. In the meantime, the entrepreneurs can utilize the common facilities already available at the TC.

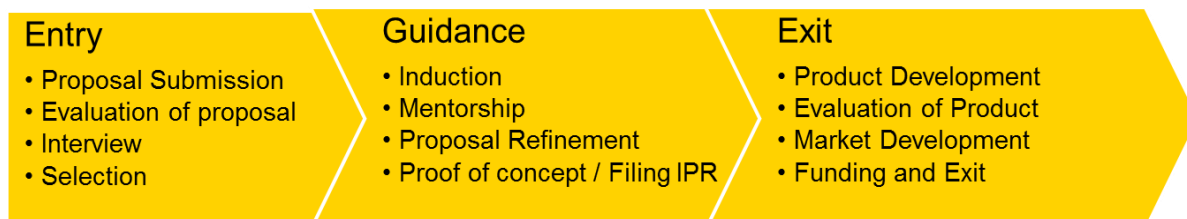
The incubation centre would not only provide space, latest technologies but also help in connecting with suppliers and skilled workers. One of the key points this incubation centre aims to achieve is to ensure focus on quality control from the get-go. Members of the incubation centre would be encouraged to start work in a setup concentrated on following environment, protocols and ethics from day one. It is therefore expected that when these enterprises come out of the incubation centre they could be examples of world class manufacturing practices.

Proposals & Selection

The success of an Incubation Centre depends on the ideas it gets for ripening. To get an 'out of the box' ideas an interest generation campaign shall be in operation throughout the year. The campaign can have conferences, seminars, road shows etc. The other processes which can be a part of robust selection process are listed below;



The incubation centre will have robust processes for entry and a systematic strategy for the exit of incubates. The entry process will involve stages like proposal submission, interview etc. A model which will be followed for the development of processes is given below;



The key parameter for the exit of incubates can be:

- Completion of incubation period
- Raising substantial investment from VC/angel investor/ Govt. etc.
- When the number of employees of the company exceeds 10/15 or so
- When annual revenue of the company exceeds substantial amount.

Investments/ Sustainability of incubation centre

There are various government schemes which can be availed to set up an Incubation Centre. Few of the Govt. Schemes and other ideas which can be used for investments generation and sustainability of Incubation Centre are listed below:

- a) Modified Special Incentive Package Scheme (M-SIPS) - The scheme is promoted by Department of Electronics & Information Technology (DeitY), Govt. of India. Under this scheme subsidy is provided for investments in capital expenditure, 20% for investments in SEZs and 25% in non SEZs. There are other incentives as well which can be availed by state govt. for setting up Incubation Centre.
- b) Atal Incubation Centre (AIC) - The Govt. of India under AIM, intends to establish 'new' incubation centres across India by providing them financial support. Under the scheme, the incubation centre will provide necessary and adequate infrastructure along with high quality assistance services to start-ups in their early stages of growth. The government will also provide a financial assistance of INR 10 Crore under the scheme if the area provided by the institution is more than 10,000 square feet. Accordingly the area proposed in Incubation Centre is 950 square meter which is in line with the requirement. The AIC scheme can be used by TC to set up Incubation Centre.
- c) Incubation Centre should have facilities which can provide pay per use support to existing and upcoming manufacturing facilities that are keen to be competitive in the ESDM sector.
- d) The Incubation Centre would provide World Class Manufacturing plant and machinery on rental basis for 2-3 years with area ranging from 800-900 Square-meter.
- e) Few of the facilities within the Incubation Centre can be set up on PPP model in collaboration with existing reputed companies present in state such as Volvo, BHEL etc.
- f) An international investment promotion cell can be set up to encourage foreign investments and form alliances with trade bodies from Japan, Taiwan, US and other countries to facilitate technology transfer.

2.10 Infrastructure Planning

The infrastructure of the proposed TC at Kanpur 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 in view of the same. Also leading practises from 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.
- ▶ **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.
- ▶ **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.
- ▶ **Hostel and staff accommodation:** A girl's hostel facility would be provided in addition to staff quarters.
- ▶ **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, personal storage, fire safety provisions and others.

TABLE 12: DETAILS OF PROPOSED INFRASTRUCTURE

Item	Area (sq mtrs)
Hostels and Quarters	1400
Staff Quarters	580
Girl's Hostel	820
Others	1370
Canteen (incl. toilets, kitchen, store, common facility etc.)	870
Utilities Room - DG Set, Transformer, UPS	350
Security Room (including toilet)	150
Admin Block	509
GM Office & Sect	40
Board Room	20
DGM Office	15
Purchase Officer	15
Accounts	15
Personnel	15
Reception Area	45
IT Dept./Server Room	15
Sr. Manager Admin Cabin	15
Manager Admin Cabin	10
Toilet Block	50
UPS/Electrical	15
Pantry	10
Examination control office	30
Staircase	50
Maintenance	10
Housekeeping	10
Fire control room	15
Circulation and wall	114
Training Block	4672
Sn. Manager/HoD Room	15
Manager Room	30
Reception	50
Counselling/placement cell	25
VC	15
Faculty Room & Record Room	60
Library with efacility	320
Multi-purpose hall for examination/drawing/reading room	45
Labs	792
Workshops (M/c Maintenance, staircase, Store Drawing Hall etc.)	2800
Toilet	180
Staircase	60

Passage (Between Training RCC and Workshop area)	280
Admin Block	1000
Classrooms	600
Reception	100
Toilet and services	100
Circulation and wall	200
Production Block	4240
HOD room/Senior manager room	15
Production office meeting room	30
Design office	100
Toilet for staff	150
Staircase	620
Multi-purpose hall	95
Seminar Hall	300
Passage (Between Workshop RCC and Workshop area)	280
Maintenance	100
Stores	150
Trial Room	100
Heat Treatment	100
Tool Assembly	500
Machine Shop (Conv. & CNC M/c	800
Metrology & Inspection	100
Production Office (Cabins, Documentation & others)	100
Additive manufacturing Lab	100
PPC	100
Entrance Lobby	50
Program Room	50
Various Labs	400
Total Size	13191
Cost of External Services: Landscaping, Water, Sanitation, Internal Roads, Lighting and Others (AC, DG Set, UPS transformer etc.) (INR in Lacs)	1050
Boundary Wall Construction Cost Estimation	150
Construction Cost @INR 29,000/sqm (in Lacs)	5025.39
Total Cost incl. contingency (INR in Lacs)	5276.66

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.

TABLE 13: DETAILS OF OTHER INFRASTRUCTURE

	Other Infrastructure	Numbers	Value (INR Lakhs)	Total (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
14	Air Compressor 125 CFM (each) Including piping and accessories	2	10	20
17	Preliminary expenses	1	40	40
18	Others (Miscellaneous)	1	50	50
	Contingency 5%			20.25
Total				425.25

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 conducive 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.

2.11 Marketing Plan of Kanpur TC

The broad suggestive framework for marketing of Kanpur TC would include the following;

TABLE 14: 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. The CNM would help strengthen market linkages of the TC 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.

The plan should clearly position the proposed TC's marketing mix with respect to its four Ps - product, price, place and promotion.

Product
<p>A General Engineering TC is proposed to be developed at Kanpur based on the presence of large engineering focused units, 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. Focus areas would include:</p>

- Manufacturing of tools 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 Kanpur TC.

- ▶ **Increasing visibility to external audience**
- ▶ **Engaging internal stakeholders**
- ▶ **Other Activities such as website, social media management, newsletters and so forth**

Place

Kanpur has historically been an industrial hub and its catchment area houses several large manufacturers. Further, the UP Government is heavily focused on driving investment into the state and has undertaken several infrastructure projects around the Kanpur region for this purpose.

2.12 Governance Structure

All the existing 18 TCs have been set up under the Societies Registration Act, 1860. 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.

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

TABLE 15: GOVERNING COUNCIL OF KANPUR TC

Representation in the Governing Council	Suggestive recommendations
(i) Ex-officio members	
<p>Representative from Government of India</p> <ul style="list-style-type: none"> ▶ 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. <p>Representative from State Government</p> <ul style="list-style-type: none"> ▶ Official from concerned industry department, ▶ Official from concerned department of technical education/training. 	<ul style="list-style-type: none"> ▶ Secretary, Industries ▶ Commissioner/Director, Technical Education & Training
(ii) Institutional members	
<ul style="list-style-type: none"> ▶ 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. 	<ul style="list-style-type: none"> ▶ Udyog Bandhu ▶ MSME Industrial Associations in Kanpur
(iii) Professional and other members	

Representation in the Governing Council	Suggestive recommendations
<ul style="list-style-type: none"> ▶ 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 	<ul style="list-style-type: none"> ▶ 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	
<p>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 <i>Member Secretary</i>.</p>	

▶ **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.

SECTION 3

Social, Environmental and Quality Safeguards

This section includes

- ▶ Environmental and Health Safeguards
- ▶ Social Safeguards
- ▶ Quality Standards

3 Social, Environmental and Quality Safeguards

Environmental and social screening enables the envisaged risks to be addressed at the very beginning of designing and conceptualizing the implementation of the expansion or the green-field development. The screenings enhance the environmental and social sustainability of a proposed project. It further allows the Identification and management of environmental and social risks that could be associated with a proposed project.

3.1 Social screening

As per World Bank guidelines TCSP has a two-tier approach³ to Social Screening Process (SSP) as defined by World Bank which is as follows:

- ▶ **No Social Screening Process (NSSP)** is applicable if a new TC is to be established within established and operational sites such as industrial estates, industrial parks, export promotion zones etc.
- ▶ **Full Social Screening Process (FSSP)** is applicable if a new TC is to be established on land acquired from private title holders and/or on Government land under different tenure systems provided by the Government to establish a new Centre.
- ▶ **Indigenous People's Social Screening Process (IPSSP)** will be undertaken
 - If a new TC is to be established in an area with high indigenous population comprising tribal populace;
 - If the area is covered by Govt. Policies and Plans such as Tribal Sub Plans and Panchayati Raj Extension to Scheduled Areas.

Further, Resettlement Policy Framework (RPF) applies to all components of Technology Centre Systems Program that requires acquisition of private land and transfer of Government/public land and that are likely to have adverse social impact including involuntary resettlement. In context of Kanpur TC:

- ▶ The identified site for the proposed TC at Kanpur. Land has been allocated by the Ministry of Textiles to O/o DC-MSME for the development of the TC by O/o DC-MSME. MoU has been signed between the Ministry of Textiles and O/o DC-MSME in this regard.
- ▶ A site visit by PMU consultants has verified that the site is free from any kind of encumbrances and squatter settlements. The allocated site for the proposed new TC at Kanpur is in a developed industrial area. So, FSSP would not be applicable as *'the land for*

³ As per TCSP Environmental management framework - Draft (9 December 2013), MoMSME

the establishment of the TC is not acquired from any private title holders and/or on Government land under different tenure systems'. Hence, in this case NSSP will be applicable since the new TC is to be established within an established and operational site of the industrial estate.

Also, the proposed location of the TC is not established in an area with high indigenous population comprising tribal populace and the area is not covered by any Govt. Policies and Plans such as Tribal Sub Plans and Panchayati Raj Extension to Scheduled Areas. Hence, this rules out the undertaking of IPSSP.

Note: While the land has been cleared from the social safeguards perspective based on the site visit by the PMU, the collection of documentary evidence is still underway and will be updated as per the receipt of the required documents. The Social Safeguards certificate will also be appended upon receipt.

3.2 Environmental screening

Environmental screening helps to identify the risks for the development project and puts it under three categories:

- ▶ No further action is needed;
- ▶ Environmental sustainability elements need to be integrated into project design because there are possible environmental and social benefits, impact, and/or risks associated with the project (or a project component) but these are limited in nature;
- ▶ Further environmental and social review and management is needed because potential environmental and social impact or risks are associated with the project.

Based on the discussions with the Site representative and site visit conducted, the ***following potential environmental concerns*** were identified:

- ▶ Trees and shrubs were present throughout the southern, eastern and western portion of the Site. The Site needs to prepare an inventory of trees on site which will be shared with EY. Further, the development of TRTC will lead to cutting of certain trees on the land. Care should be exercised while developing the layout of the TRTC so as to minimize the number of trees to be cut. Due permission needs to be taken under the Trees Protection Act, 1976 during construction phase for felling of trees from the competent authority. Efforts may be made to replant trees, wherever possible, and compensatory afforestation may be considered in accordance with the State legislation, in case trees are cut.
- ▶ The geographical location of the site is in seismic zone III and the region has experienced earthquake tremors in the recent past. It is important that the design phase of the TC considers earthquake resilience (capable of handling earthquakes in seismic zone IV).

- ▶ Care may be taken to preserve the natural terrain and trees present on the Site during land clearance and construction.
- ▶ Considering the water table conditions in the region, use of ground water may put additional pressure on the site. Therefore feasibility of rain water harvesting may be analysed during design phase to make an effort towards reduce environment footprint.

The Site needs to mitigate the possible environmental concerns identified above. The design and construction of the TC should be done accordingly. The mitigation factors should be incorporated during the construction phase.

Note: While the land has been cleared from the environmental safeguards perspective based on the site visit by the PMU, the collection of documentary evidence is still underway and will be updated as per the receipt of the required documents.

3.3 Quality system

The new TC would further aim to obtain various process certificates to enhance its competitiveness such as:

TABLE 16: INDICATIVE CERTIFICATIONS OF QUALITY SYSTEMS

Name of certification	Area	Details
ISO 9001	Quality Management System	<ul style="list-style-type: none"> ▶ This would help to monitor, control, and improve quality of 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	<ul style="list-style-type: none"> ▶ 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	<ul style="list-style-type: none"> ▶ For quality professional practice, performance and enhance

Name of certification	Area	Details
	services for non-formal education and training	<p>transparency</p> <ul style="list-style-type: none"> ▶ 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	<ul style="list-style-type: none"> ▶ 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	<ul style="list-style-type: none"> ▶ 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	<ul style="list-style-type: none"> ▶ 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 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.

SECTION 4

Financial Analysis

4 Financial Analysis

4.1 Financial assumptions

The project construction is expected to start in the financial year 2016-2017. The key assumptions are as follows:

TABLE 17: KEY ASSUMPTIONS

Start of Project Construction	1-Jan-17
FY of start of project	1-Apr-16
Construction Period	Months
	15
Commencement of Operation, Date	1-Apr-18
FY of Commencement of Operation	1-Apr-18
Number of Years, Useful Life	10

4.2 Income and Expenditure assumptions

Capital Expenditure (Including contingency @5%)	Cost (INR Lakhs)
Production Machinery and equipment	2473
Training machines and equipment	2588
Other infrastructure and pre-project expenses	683
Building and construction	5276
Total Capex including contingency	11020

Detailed assumptions and figures around income for all three revenue streams have been described in the tables above as follows: production revenue estimates (Table 7), training revenue estimates (Table8), consultancy revenue estimates (Table 11). Expenditure on production and training machines, as well as construction and other infrastructure have been defined in Tables 7,9,12 and 14 respectively.

The year on year revenue and expenditure figures for the different streams have been detailed out in the Income statement provided in Table 24.

TABLE 18: UTILIZATION ASSUMPTION FOR PRODUCTION

Machine utilisation	Year	
2 nd year of production	2019-20	25%
3 rd year of production	2020-21	40%
4 th year of production	2021-22	50%
5 th year of production	2022-23	60%
6 th year of production	2023-24	70%
year on increase in machine utilisation 7 th year onwards	2024-2025	10%

4.3 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. In the initial phase, construction of infrastructure for basic training courses is planned along with procurement of basic machines.

TABLE 19: PROJECT COST AND FINANCING

Project Cost and Phasing (TCSP)		Year 1	Year 2
Particulars	Unit	1-Apr-16	1-Apr-17
Project Cost w/o IDC	Rs. Lakhs	1,425	9,595

4.4 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%
Repair & maintenance, (Building)	1.7%
Insurance cost of new P&M (Post commissioning)	0.5%
Working Capital Assumptions	

Cash in Hand	60 Days
Accounts Receivables	90 Days
Suppliers Credit (A/P)	30 Days
Finished goods Storage	30 Days
Inventories (RM, Consumables)	
Finished goods	90 Days
Job Work	90 Days
Training	90 Days
Days in a year	90 Days
Tax and Others	
Inflation (Salary etc.)	10%

Depreciation Rates		
Asset Class		WDV
Tangible Assets		
	Plant and machinery	13.91%
	Buildings	10.00%

4.5 Financial Statements

Working capital and cash flow statement

Overall net working capital requirement for the TC is expected to grow from about INR 39 lakhs in 2018 to INR 564 lakhs by year 2027.

FIGURE 9: NET WORKING CAPITAL AND CASH FLOW CLOSING BALANCE

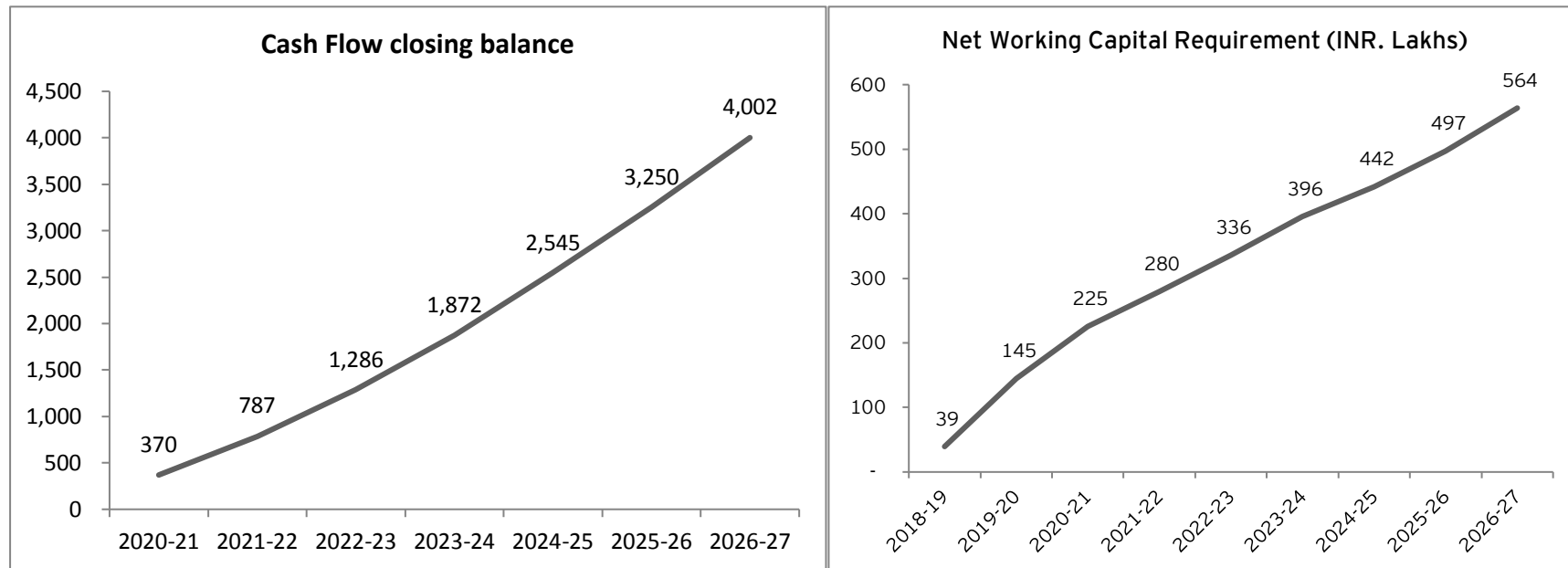


TABLE 20: WORKING CAPITAL SCHEDULE

Working Capital Schedule (Figures Rs in lacs)											
Year	Apr-17	Apr-18	Apr-19	Apr-20	Apr-21	Apr-22	Apr-23	Apr-24	Apr-25	Apr-26	Apr-27
Raw Material Storages											
Finished goods	-	4	17	28	35	42	49	54	59	65	71
Training	0.38	1	2	3	4	4	5	5	5	6	6
Consumable tools											
Finished goods	-	1	2	3	4	5	6	7	7	8	9
Training	0.38	1	2	3	4	4	5	5	5	6	6
Consumable stores											
Finished goods	-	0	2	3	3	4	5	5	6	6	7
Training	0.21	1	1	2	2	2	3	3	3	3	3
Finished Product Storages											
Finished goods	-	7	28	45	56	68	79	87	96	105	116
Accounts Receivables	0.34	24	92	147	185	224	266	300	342	394	459
Gross Working Capital	1.31	40	147	234	294	354	416	466	523	592	677
Suppliers Credit	0.33	0	3	9	14	17	21	24	26	29	31
Net Working Capital Requirement	0.98	39	145	225	280	336	396	442	497	564	646
Increase/Decrease In Net Working Capital	0.98	38	105	81	54	56	59	46	55	67	82

TABLE 21: CASH FLOW STATEMENT

Cash Flow (Rs in Lacs)												
Years	1-Apr-2016	1-Apr-2017	1-Apr-2018	1-Apr-2019	1-Apr-2020	1-Apr-2021	1-Apr-2022	1-Apr-2023	1-Apr-2024	1-Apr-2025	1-Apr-2026	1-Apr-2027
Income post Depn and interest	-27	-56	-1,474	-1,000	-615	-405	-217	-36	117	229	349	515
Add: Depreciation			1,281	1,128	994	876	772	682	602	531	469	415
Inflow from Capital Fund/Grant	1,425	9,595										
Capital Fund to balance -ve cash flows, if any	27	65	253	18								
Total Cash Inflow	1,425	9,604	60	146	379	471	556	646	719	761	818	930
Investment in Assets	1,425	9,595										
Net Change in WC		1	38	105	81	54	56	59	46	55	67	82
Total Cash Outflow	1,425	9,596	38	105	81	54	56	59	46	55	67	82
Opening Balance			8	30	71	370	787	1,286	1,872	2,545	3,250	4,002
Surplus/Deficit		8	22	41	299	417	499	586	673	706	751	848
Closing Balance		8	30	71	370	787	1,286	1,872	2,545	3,250	4,002	4,849

Income & expenditure statement

The income to the proposed centre from training will start accruing from year 2017 with completion of phase 1 (basic training infrastructure and procurement of basic machines) and start of basic courses. Initially an income of around INR 124 lakhs is expected in year 2016-17. Once the overall construction is complete, the TC revenue is expected to grow from INR 124 lakhs in 2017 to INR 3471 lakhs by year 2027.

TABLE 22: INCOME AND EXPENDITURE STATEMENT

Income and Expenditure Year	Construction period		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
	201 6-17	1- Apr- 17	1-Apr- 18	1-Apr- 19	1-Apr- 20	1-Apr- 21	1-Apr- 22	1-Apr- 23	1-Apr- 24	1-Apr- 25	1-Apr- 26	1-Apr- 27
Income (Rs in Lacs)												
Training Income		123	377	734	1,039	1,259	1,385	1,524	1,676	1,760	1,848	1,941
Sale of Finished goods			70	282	451	564	677	789	868	955	1,051	1,156
Sale of Scrap		1.1	5	13	19	23	27	30	33	36	39	42
Consultancy Income		-	6	13	20	30	44	67	100	148	223	333
Total Income		124	459	1,041	1,529	1,876	2,132	2,410	2,678	2,899	3,160	3,471
Expenditure												
Variable Operating expenditure												
Raw materials		1	18	66	104	129	154	178	196	215	235	258
Finished goods			15	58	93	116	139	163	179	197	216	238
Training		1	4	7	11	13	14	16	17	18	19	20
Consumable tools		1	6	15	22	27	31	36	39	42	46	49
Finished goods			2	7	11	14	17	20	22	24	26	29
Training		1	4	8	11	13	15	16	18	18	19	20
Consumable stores		1	4	10	15	19	22	25	27	29	32	34

Finished goods			1	6	9	11	14	16	17	19	21	23
Training		1	2	4	6	7	8	9	10	10	11	11
Utilities (Electricity & water)		6	23	54	80	99	112	126	139	149	159	171
Finished goods			5	18	29	37	44	51	56	62	68	75
Training		6	19	36	51	62	68	75	82	87	91	95
Variable Operating expenditure		9	51	145	221	274	319	365	401	435	472	512
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			143	143	143	143	143	143	143	143	143	143
P&M			51	51	51	51	51	51	51	51	51	51
Buildings			92	92	92	92	92	92	92	92	92	92
Training Expenses			38	73	104	126	139	152	168	176	185	194
Other Production. & Admin Expenditure			36	81	118	145	165	187	207	225	245	269
Marketing expenses		25	25	15	15	15	15	15	15	15	15	15
Insurance of new machines			24	24	24	24	24	24	24	24	24	24
Fixed Operating Expenditure	27	171	601	768	928	1,131	1,258	1,400	1,558	1,703	1,870	2,029
Total Expenditure	27	180	652	913	1,149	1,405	1,577	1,764	1,959	2,139	2,342	2,541
Income (Gross Margin)	(27)	(56)	(193)	128	379	471	556	646	719	761	818	930
Depreciation	-	-	1,281	1,128	994	876	772	682	602	531	469	415
Income post Depn and interest	(27)	(56)	(1,474)	(1,000)	(615)	(405)	(217)	(36)	117	229	349	515
Income TAX	-	-	-	-	-	-	-	-	-	-	-	-
Income after tax	(27)	(56)	(1,474)	(1,000)	(615)	(405)	(217)	(36)	117	229	349	515

Balance sheet

TABLE 23: BALANCE SHEET

Balance Sheet (Rs in Lacs)												
Years	1-Apr-16	1-Apr-17	1-Apr-18	1-Apr-19	1-Apr-20	1-Apr-21	1-Apr-22	1-Apr-23	1-Apr-24	1-Apr-25	1-Apr-26	1-Apr-27
Liabilities												
Capital fund	1,425	11,020	11,020	11,020	11,020	11,020	11,020	11,020	11,020	11,020	11,020	11,020
Capital for -ve cashflows	27	92	345	363	363	363	363	363	363	363	363	363
Reserves & Surplus	(27)	(83)	(1,557)	(2,557)	(3,171)	(3,576)	(3,793)	(3,828)	(3,711)	(3,482)	(3,133)	(2,618)
Total	1,425	11,030	9,808	8,827	8,212	7,808	7,591	7,555	7,673	7,902	8,250	8,765
Fixed Assets												
Gross Block	1,425	11,020	11,020	11,020	11,020	11,020	11,020	11,020	11,020	11,020	11,020	11,020
Less: Accumulated Depreciation	-	-	1,281	2,409	3,403	4,279	5,051	5,733	6,335	6,866	7,335	7,750
Net Block	1,425	11,020	9,739	8,611	7,618	6,742	5,969	5,288	4,686	4,155	3,685	3,270
Current Assets												
Cash	-	8	30	71	370	787	1,286	1,872	2,545	3,250	4,002	4,849
Other Current Assets	-	1.0	39	145	225	280	336	396	442	497	564	646
Total	1,425	11,030	9,808	8,827	8,212	7,808	7,591	7,555	7,673	7,902	8,250	8,765

4.6 Profitability and IRR

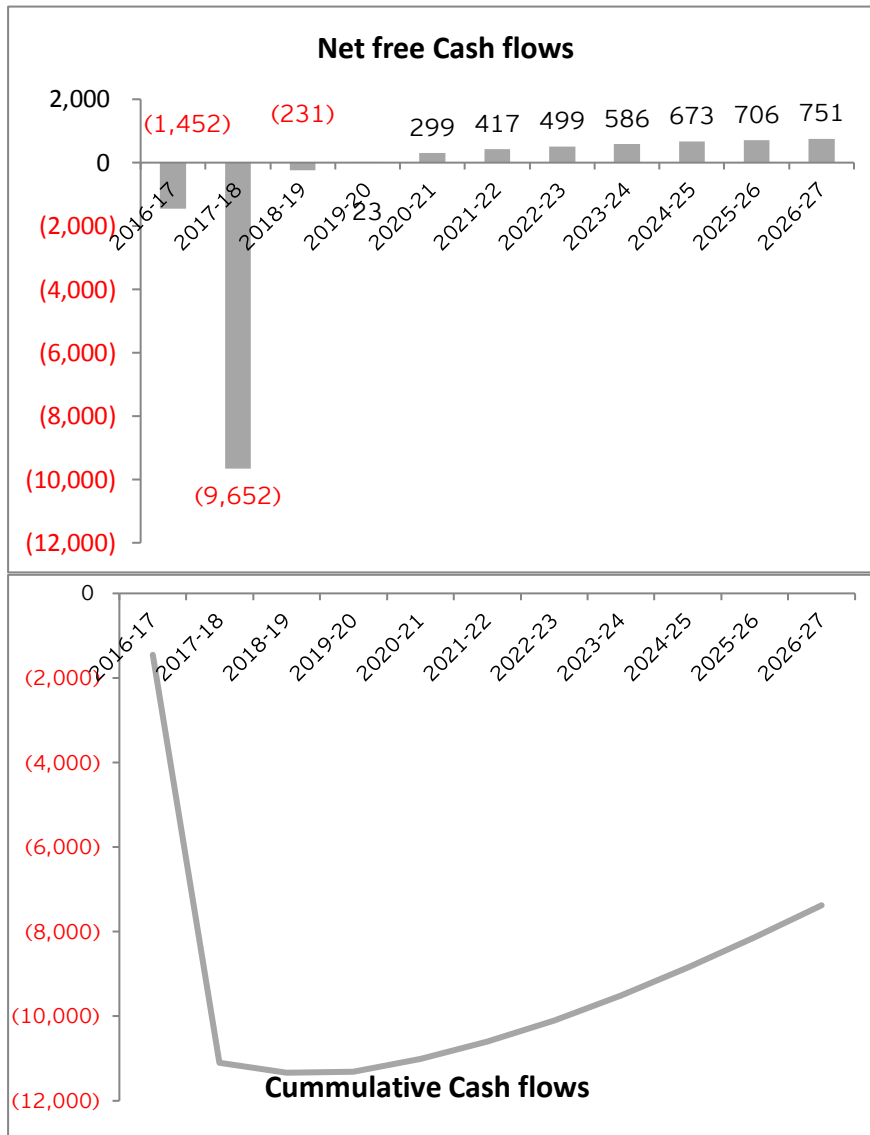
Overall project profitability has been estimated considering phased investment in plant & machinery and infrastructure. The full-fledged operations are expected to start from the year 2017-18. Hence the project IRR for a period of 12 years till 2027-28 is 9.0%.

TABLE 24: PROFITABILITY WITH INVESTMENT PLANT & MACHINERY

Project IRR	9.0%
Payback period	>11 years

The project is expected to generate positive net free cash flows starting year 2027-28.

FIGURE 10: NET FREE CASH FLOWS AND CUMULATIVE CASH FLOWS



4.7 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.

- ▶ For every 5% change in revenue from training, average change in IRR is 0.96%.
- ▶ For every 5% change in project cost, change in IRR is -0.55%.
- ▶ For every 5% change in revenue from production, change in IRR is 0.46%.
- ▶ For every 5% change in revenue from consultancy, change in IRR is 0.17%.

TABLE 25: SENSITIVITY OF IRR

% Change in Project Parameter	Impact on IRR			
	Project Cost	Revenue from Training	Revenue form Production	Revenue from Consultancy
-5	9.6%	7.9%	8.6%	8.9%
0	9.0%	9.0%	9.0%	9.0%
5	8.5%	10.1%	9.5%	9.2%
10	8.0%	11.1%	9.9%	9.4%

SECTION 5

Key Risks and Mitigation

5 Key Risks and Mitigation

The key risks associated with implementation of the project along with possible mitigation measures are 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;

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	<ul style="list-style-type: none"> ▶ 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 <ul style="list-style-type: none"> ▶ 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 	<ul style="list-style-type: none"> ▶ 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
	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 ▶ 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. ▶ 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	✓		✓

Key broad area	Risk	Mitigation	Impact on		
			Cost	Time	Resources
		construction material			
	Water contamination and health risks associated with setting labour camp for construction	<ul style="list-style-type: none"> ▶ 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	<ul style="list-style-type: none"> ▶ 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.	<ul style="list-style-type: none"> ▶ 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 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 over-run, management of building contractors.	<ul style="list-style-type: none"> ▶ Appoint a PMC for a design and build contract for managing construction. 	✓	✓	

Key broad area	Risk	Mitigation	Impact on		
			Cost	Time	Resources
		<ul style="list-style-type: none"> ▶ 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 <ul style="list-style-type: none"> ▶ Initiated by MoMSME, ▶ Machinery supplier constraints ▶ Product discontinuation 	<ul style="list-style-type: none"> ▶ 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.	<ul style="list-style-type: none"> ▶ Appointment of third party Government quality assurance agency. 			
On-boarding of Key players	Delay in on boarding of key project stakeholders <ul style="list-style-type: none"> • Technology Partner • Construction Network Manager • Construction Management Consultant Quality Assurance 	<ul style="list-style-type: none"> ▶ Clearly defined scope and incentives for stakeholders. ▶ Timely contracts with the project stakeholders. 		✓	✓
Procurement of machinery	Delay in receiving inputs from MTP and procurement of machines and goods due to high Lead time and time taken for clearances	<ul style="list-style-type: none"> ▶ Timeline for each deliverable and monitoring ▶ Machines and equipment chosen should be standard and popular models available in 		✓	

Key broad area	Risk	Mitigation	Impact on		
			Cost	Time	Resources
		<p>market. Early release of order confirmation and advance if any.</p> <ul style="list-style-type: none"> ▶ Appointment of efficient and pre-approved Clearing & Handling Agency (CHA) to ensure timely clearances and transportation of machines. 			
	Variation in Equipment required and finally procured. Too stringent specs may lead to high price and low competition, loose specs may lead to low price but low quality	<ul style="list-style-type: none"> ▶ Neutral specifications to be drafted based on thorough research on TC requirements and current models available. 	✓	✓	
Trained resource availability	Availability of trained manpower for operation of new machines	<ul style="list-style-type: none"> ▶ Machine specific training programmes to be conducted for training of key personnel and knowledge sharing. 			✓
Market	<ul style="list-style-type: none"> ▶ 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 	<ul style="list-style-type: none"> ▶ Expansion of product base. ▶ Increase in customer base. ▶ Develop a backup plan for retiring of obsolete machines. 			
Policy	<p>Change in Government Policy/ Schemes for</p> <ul style="list-style-type: none"> ▶ Training 	<ul style="list-style-type: none"> ▶ Increase existing customer base. ▶ Diversify into new sectors. 	✓		✓

Key broad area	Risk	Mitigation	Impact on		
			Cost	Time	Resources
	<ul style="list-style-type: none"> ▶ key sectors E.g. Change in Government space programme, increase in imports may affect orders from major clients 				
Taxation	Change in service tax policy on training may adversely affect training revenue	<ul style="list-style-type: none"> ▶ Institute should keep abreast with policy changes and the same should be considered while designing the course and fee structure. 			
Human resource	<ul style="list-style-type: none"> ▶ Labour availability ▶ Retention of key employees (Flight of key talented people can make it difficult to achieve centre's growth plans) 	<ul style="list-style-type: none"> ▶ Planning for holidays and lean periods. ▶ Good incentive scheme and career development plans. 	✓		✓
Management risk	Lack of capable management to run the TC	<ul style="list-style-type: none"> ▶ Leadership training. ▶ Succession planning. 			✓
Maintenance risk/ spares - Availability of spares & services	Delay in availability of spares and service support at a reasonable cost	<ul style="list-style-type: none"> ▶ Procure models that are likely to continue for at least next 5 yrs. to ensure better availability of spares and services. 	✓		
Performance of key stakeholders	Poor performance of Outsourced agencies like TP, CNM and PMC	<ul style="list-style-type: none"> ▶ Establishment of KPIs ▶ Periodic review of performance. Suitable penalty clauses to be added in the ToRs. 			✓
Weather	Delay in construction due to monsoon season	<ul style="list-style-type: none"> ▶ Planning for lean periods and periods of low construction activity. 	✓	✓	

SECTION 6

Conclusion

6 Conclusion

The proposed TC at Kanpur will focus on General Engineering. It will aim to support and strengthen MSMEs and help them improve competitiveness through training, production support and advocacy. Training, Tool manufacturing and consultancy / advisory streams would be the prominent activities to be undertaken by the TC. TC shall also support MSME clusters in technology and engineering solutions and for improvement of their quality systems and productivity. For improvement in productivity, TC would initiate design clinics, training in lean manufacturing and project based consultancy and provide consultancy services to MSMEs in the field of product design and development, tool design, manufacturing and innovations in process and productivity. Some recommended next steps, in addition to the provisions of the DPR, are as follows:

- ▶ The TC shall build itself up as a key regional skill development centre. It could not only provide advanced training in manufacturing technology but also work as a key facilitator for existing ITIs and polytechnic institutions in the catchment area. It could provide curriculum development support, training for trainers, mentoring to new institutions, and testing and certification services to increase competitiveness of ITIs and Polytechnic institutions.
- ▶ The new TC shall take steps to form consortium with MSMEs 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 shall support the erstwhile famous Textile Industry of Kanpur in four areas - repair and maintenance, spare parts manufacture, training and process automation.
- ▶ The TC could 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 and handhold for a visible improvement at the end of 12 months period. Membership can be for a nominal fee.

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.

SECTION 7

Annexures

7 Annexures

Annex I: Minutes of Meeting (Stakeholder Consultation)

Date	9-11 August 2016	
Time	All day	
Location	Kanpur	
	Name	Designation
MSME-DI Personnel		
EY Personnel	Dinesh Pradhan Rajkumar Deegwal Tanvi Ratna	Senior Advisor Senior Consultant Senior Consultant
Agenda	<p>Discussion on the following points</p> <ul style="list-style-type: none"> ▶ The industrial landscape of Kanpur and the catchment area. ▶ Key requirements / challenges faced by OEMs and MSME units in <ul style="list-style-type: none"> ○ Access to technology ○ Access to skills ○ Business advisory services ▶ General engineering challenges across sectors such as defence, automotive, textiles, equipment manufacture and others. ▶ Key trends in the industry and insight on potential areas of growth 	

Sr.	Industry Representative		Key points discussed during the meeting
No.	Name	Designation	
Meeting at HAL, Accessories Division, Lucknow on 9 August 2016			
	R. Madhavan	General Manager	<p>Difficult to identify MSMEs who can cater to their requirement. No product-wise catalog for them to identify suppliers. Many suppliers are MSMEs in practice but not registered as MSMEs due to cumbersome procedures. Thus, HAL also loses out on the 20% localization requirement.</p> <p>No way to determine quality of products of MSMEs. HAL cannot take trials or split orders due to procurement rules. Need some certification or specification of quality of product.</p> <p>Government tool rooms are often not competitive enough or refuse to bid with private sector tool rooms. Thus, due to</p>

			<p>procurement rules HAL is not able to use their services.</p> <p>Face challenges finding specific machining/finishing/training requirements:</p> <p>Honing</p> <p>Lapping</p> <p>EDM</p> <p>Advanced welding training</p> <p>Jig boring</p> <p>Jig grinding</p> <p>HAL outsources components and has over 70 vendors that are spread out all over India, not localized. Thus, it is a challenge to keep sending officers to all the vendors for oversight and quality assurance.</p>
Meeting at Tata Motors, Lucknow on 9 August 2016			
	Brajesh Singh	Divisional Manager (Production Engineering), Planning	<p>Training and skilling of workforce is a constant requirement, especially in 6 areas: welding, machining, sheet metal work, maintenance, tool and die making and painting. Tata has its own training center for workers but can look at training for vendors</p>
	Saurabh Singh	Divisional Manager, Supplier Quality	<p>Major skill gap on vendor side for Tata's requirements</p> <p>Need to standardize tooling on vendor side</p> <p>Poor quality of techniques and poor quality management on vendor side</p>
	Manish Sawhney	Head, Supplier Quality	<p>Keen on technical and managerial training for vendors</p>
	Harmesh Sawhney	Sr. Manager (Advance Quality)	<p>Have done business with ITUP Lucknow</p> <p>Tooling requirement of the Lucknow plant is done through local vendors. However their suppliers are all over India, such as JBM auto, Godrej etc. Tata has not looked at Government tool rooms as suppliers yet</p>
			<p>Main requirement is in sheet metals, plastic moulds and jigs/fixtures. Some requirements are as follows:</p> <p>Press Tool 2m x 1m</p> <p>600 x 500 casting</p> <p>500 x 500 plastic moulds</p> <p>High speed machining center</p> <p>1 universal or 1 horizontal/1 vertical machining center</p> <p>Mechanical press, Press brake</p>

Stakeholder Consultation in Kanpur on 10 August 2016			
		<p>Representatives of HAL, ALIMCO, Small Arms factory and other ordnance units, textile units and associations, private tool rooms, rubber units, printing and packaging units, writers association (full list attached separately)</p>	<p>Presentation by TCSP team on TCSP program and initial contours of Kanpur TC, followed by stakeholder feedback</p> <p>Feedback from Tool Room operators: Need for many more tool rooms as industry still meets about half its requirement from Singapore/Taiwan/China for speed and accuracy Good local tool rooms are overburdened and take a month just to give a quotation and 6-8 months to deliver Festo is ready to support TC in low cost automation</p> <p>Feedback from Ordnance and PSUs: Lots of outsourcing for components There are vendors for machining but not for sheet metal Requirement of 3D scanning for reverse engineering Need very high precision, high confidence tooling, no deviation allowed in defence Sheet metal and composite parts difficult to procure Shortage of skilled manpower Need R&D and product improvement support Need process audit to realize cost savings Total engineering solution is helpful for some units</p> <p>Feedback from Textiles sector: Need trained manpower for latest textiles machines Need testing labs for products, banned chemicals Need spare parts for machines Need machine maintenance Need zero discharge technology</p> <p>Feedback from Rubber industry Need tools/dies Need trained staff Need support for spare parts, all are imported from China/Taiwan now</p> <p>Feedback from printing and packaging industry Very large industry in Kanpur, over 250 units Need skilled manpower Writers association highlighted the need for skilled inspectors, on top of skilled operators</p>

Meeting at Small Arms Factory on 10 August 2016			
	P.C. Barnwal, Senior General Manager		Factory has its own tech center and tool room However, ordnance factory tool room costs are higher than private sector or others as pay scales of workers are very high Tools made internally are about 10 times more expensive than industry so it is always cheaper to procure
	Hitendra Singh, Addl. General Manager		Challenge in manufacturing gauges. Would need good vendors or tooling support from the TC for this Some machines such as thread grinding are very old and not economically feasible to replace, so it would help if the TC carried these machines
	Kumar Ramakant, Works Manager		Discussion was followed by factory visit
Meeting with Mr. Lohia in Kanpur on 10 August 2016			
	Mr. Rajkumar Lohia	Chairman, Lohia Starlinger Limited	Training is the main requirement of the city Lohia Starlinger has started its own training facility for the plastics sector targeting 500 students per year, though the industry requirement is many times that. Amongst vendors in the area there is no skill upgradation, no CNC machines used Mr. Lohia expressed his support for the project and arranged a site visit for his plants
Meeting at ALIMCO plant			
	D.R. Sarin	Chairman and Managing Director	ALIMCO was set up in 1971 on the direct orders of Indira Gandhi, on land given from IIT Kanpur Kanpur is their headquarter but they have established auxiliary units at Bhubhaneshwar, Jabalpur, Bangalore, Kolkatta, Mumbai, Delhi, Guwahati and near Chandigarh
	A.K. Srivastava	Deputy General Manager (Production) and Chief Vigilante Officer	Over 400 kinds of products are made at the Kanpur plant for conditions ranging from disability, blindness, deafness, mental illnesses, leprosy and polio. Products include wheelchairs, crutches, braille slates etc. Clients are often the poorest of the poor so despite more hi-tech products being present, there is a preference for hardy products that do not need maintenance.

			<p>ALIMCO now has an approved modernization plan in place and is now in the process of procuring and shifting production to modern CNC and other machines, for which their staff is not currently trained.</p> <p>They face a second challenge in workforce as the bulk of their workers are retiring but new workforce is not coming in easily.</p> <p>They face a challenge sourcing components as no local supplier has quality up-to-par.</p> <p>ALIMCO has a tooling requirement as well and would require 30-40 tools per year.</p> <p>They also struggle to find dedicated consultancy support for their production locally. They have approached IIT Kanpur in the past but students keep graduating and leaving projects mid-cycle.</p>
Meeting at Lohia Technical Training and Research Center (TTRC)			
	Rajeev Kumar Dwivedi	Director	<p>TTRC is the only facility in India catering to training for the Raffia sector. This is the largest plastic consuming sector in India.</p> <p>The course offered is unrecognized by the UGC or any official authority but has acceptability within the Lohia group and their clients.</p> <p>Course duration is 12 weeks, with 4 weeks at the training center. High school level, even BA/B.Com graduates join.</p> <p>The USP of the course is 100% placements</p> <p>Lohia is one of the largest manufacturers of plastic weaving machines in the world and these machines are exported to 70 countries. Training is conducted on Lohia's machines and candidates usually get placed within the Lohia Group or its customers itself.</p> <p>The center is coming up with a new Manufacturing Technology Training Center which is entirely for training staff for the Lohia group.</p> <p>This TC will offer 3 courses: machine assembly technician, machine cutting technician and sheet metal/welding technician.</p> <p>The training will be free and all candidates will be absorbed into the Lohia group as employees post training.</p>

Meeting at Lohia Manufacturing Plant			
			<p>The plant faces a real challenge in finding skilled workers in Kanpur. Even basic skills such as understanding engineering drawings are poor.</p> <p>Need multi-skill workers, for example the CNC operator should be able to operate all kinds of CNC machines.</p> <p>Particular skill sets that are a challenge are:</p> <p>Good welders, with good hand skill and an understanding of the context of various aspects such as fillet sizes etc.</p> <p>Operators for shearing, CNC punching, bending etc.</p> <p>Skill level of vendors is also a challenge. The group is in the process of making captive ancillaries.</p> <p>No good heat treatment or calibration facilities in Kanpur</p>

Annex II: Environment, Health and Safety

The TC proposed in Kanpur will be focussed on general engineering and will involve the following activities:

- ▶ Manufacturing of tools for general engineering
- ▶ Long and short term training programs in CNC/ CAD/CAM, advance welding, industrial and process automation etc.

Management

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

Planning and design

As per the environmental screening conducted for the Site conducted in September 2016, the TC is located in an industrial zone and was observed with potential environmental impacts which will be covered under the planning design and construction phase.

Table 26: Potential environmental issues during planning phase

Component	Associated impact	Mitigation measures
The geographical location of the site is in seismic zone III and the region has experienced earthquake tremors in the recent past.	Loss to property	It is important that the design phase of the TC considers earthquake resilience (capable of handling earthquakes in seismic zone IV).

Construction phase

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

Activity	Associated impact	Recommendation for mitigation
Clearing of land (before initiating the construction work, clearing of the shrubs and bushes shall be carried out)	Loss of trees, Soil erosion	<ul style="list-style-type: none"> • Due permission will be taken under the Trees Protection Act, 1976 during construction phase for felling of trees from the competent authority. Efforts will be made to replant trees, wherever possible, and compensatory afforestation may be considered in accordance with the State legislation, in case trees are cut. • 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	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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.

Activity	Associated impact	Recommendation for mitigation
		<ul style="list-style-type: none"> Personal protective equipment will be provided for workers performing drilling at site.
	Occupational health hazards	<ul style="list-style-type: none"> 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 other wastes	<ul style="list-style-type: none"> 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 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	<ul style="list-style-type: none"> 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; Twelve small sterilized dressings.

Activity	Associated impact	Recommendation for mitigation
		<ul style="list-style-type: none"> • Six medium size sterilized dressings. • Six large size sterilized dressings. • Six large size sterilized burn dressings. • Six (1/2 oz.) packets sterilized cotton wool. • One (2 oz.) bottle containing a 2 per cent alcoholic solution of iodine. • One (2 oz.) bottle containing sal-volatile having the dose and mode of administration indicated on the label. • One roll of adhesive plaster. • One snake-bite lancet. • One (1 oz) bottle of potassium permanganate crystals. • One pair of scissors. • One copy of the first-aid leaflet approved by the Chief Inspector of Factories.
	Chances of spread of sexually transmittable diseases like AIDS	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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

Activity	Associated impact	Recommendation for mitigation
		sheds of the construction workers would be provided to avoid the surface water pollution.
	Land contamination	<ul style="list-style-type: none"> • 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.
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	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • Proper maintenance of vehicle will be carried out to avoid any leakage of oil or grease.
	Water contamination	<ul style="list-style-type: none"> • Proper maintenance of vehicle will be carried out to avoid any leakage of oil or grease.
	Safety risks	<ul style="list-style-type: none"> • 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	Air pollution	<ul style="list-style-type: none"> • D.G will be optimally used with proper orientation and adequate stack height.

Activity	Associated impact	Recommendation for mitigation
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)		<ul style="list-style-type: none"> Stack monitoring will be carried out on regular basis. Proper maintenance of the DG will be carried out on regular basis.
	Noise pollution	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> A covered area will be defined for storage of HSD with concrete flooring
	Safety risks	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> Adequate PPE's will be identified and provided to the workers at site.
Installation and operation of concrete mix plants and batching plants (In case, these are installed on temporary basis at the project site)	Noise pollution	<ul style="list-style-type: none"> Noise shielding will be used where practicable and fixed noise sources will be acoustically treated for example with silencers, acoustic louvers and enclosures. 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	<ul style="list-style-type: none"> Provision of clause in contractor's agreement will be made that bans child labour and

Activity	Associated impact	Recommendation for mitigation
	and forced labour	forced labour at project site. <ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • Temporary crèche facility will be provided in case of migrant labourers children residing in the camps to ensure safety.
	Water wastage	<ul style="list-style-type: none"> • Emphasis will be given on optimization of water usage and supply of potable drinking water for labour camps.
	Pressure on forest produce	<ul style="list-style-type: none"> • Fuel will be made available to construction workers so as to reduce pressure on forest produce or local fuel wood resources.

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 27: Potential hazards during O & M phase

Potential impact	Recommendation for mitigation
Deterioration of the structure over the period of time	<ul style="list-style-type: none"> • 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 and soil contamination	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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.

Manufacturing

Table 28: 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	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • Monitoring of the vibration will be conducted on regular basis.
Heat treatment	Air pollution	<ul style="list-style-type: none"> • Ventilation would be provided in work shop to avoid concentration of the fumes.
	Burn injury	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • Heat stress monitoring of the employees will be conducted once a year to ensure safe and appropriate working conditions.

Activity	Associated impact	Recommendation for mitigation
Non-maintenance of clean premises	Injury due to trips	<ul style="list-style-type: none"> • 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 operations to be carefully handled to ensure environment safeguard)	Land contamination and Water contamination	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • A covered area will be defined for storage of HSD with concrete flooring.
	Safety risks	<ul style="list-style-type: none"> • Inflammable substance will not be allowed in the premises.
Specialised Tool manufacturing		
Designing of components	Depletion of natural resource	<ul style="list-style-type: none"> • Paper would be recycled for rough work.

Activity	Associated impact	Recommendation for mitigation
	(paper)	
Machining activities	Land contamination due to waste oil and waste coolant	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • Ear muffs / Ear plugs will be provided to officials working on these activities.
	Land contamination due to metal scrap	<ul style="list-style-type: none"> • The metal scrap would be collected appropriately and stored in a designated area before being disposed of/sold to a third party.
	Cut/injury due to metal scrap	

Activity	Associated impact	Recommendation for mitigation
	lying unmanaged	
Use of D.G sets	Noise pollution	<ul style="list-style-type: none"> Acoustic enclosures would be provided to avoid noise pollution.
	Land contamination	<ul style="list-style-type: none"> Diesel would be poured in D.G set using funnel. Concrete flooring would be made near the D.G set.
	Air pollution	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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.

Environment

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

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 aluminum; 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. aluminum) 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 aluminum 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.

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 refueling 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.

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

Annex III: 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 Kanpur 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 29: DESCRIPTION OF ROLES AND RESPONSIBILITIES

Profile/ Designation	Minimum Qualification	Minimum Experience	Other Skill set/ requirements	Key Responsibilities
General Manager	B.Tech or equivalent (Mechanical/Production/Industrial Engineering) Desirable: MBA or M.Tech	15 Years with 8 years in similar role	<ul style="list-style-type: none"> ▶ Tool Manufacturing/Design/ Product development/ Training. ▶ Experience in Project Implementation will be preferred 	<ul style="list-style-type: none"> ▶ 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 or equivalent (Mechanical/Production/Industrial Engineering)	12 Years with 5 years in similar role	<ul style="list-style-type: none"> ▶ Tool Manufacturing/Design/ Product development/Training. ▶ Experience in Project Implementation will be preferred 	Head of Production, Design, Consultancy and Training
Manager -	CA/ICWA or	8 Years with 3	<ul style="list-style-type: none"> ▶ Experience in the area of Administration, 	Head of Accounts, Administration and HR:

Profile/ Designation	Minimum Qualification	Minimum Experience	Other Skill set/ requirements	Key Responsibilities
Admin. and Accounting	MBA with bachelor's degree in Commerce/ Accounting / Finance Desirable: Familiarity with labour laws and IR, LLB	years in similar role	HR and Accounting <ul style="list-style-type: none"> ▶ The Manager must also have basic knowledge of government laws, regulations and state specific compliances ▶ Familiarity with ERP/accounting softwares 	<ul style="list-style-type: none"> ▶ General housekeeping of TC ▶ Bookkeeping, accounting and finance including financial analysis ▶ TC security ▶ Payroll ▶ Procurement management and store keeping
Sr. Officer - Admin. & HR	MBA (HR)	5 Years	<ul style="list-style-type: none"> ▶ Experience in the area of HR and Administration ▶ Familiarity with Industrial laws, industrial relations, labour laws and compliances 	<ul style="list-style-type: none"> ▶ Housekeeping of TC ▶ Security systems operation ▶ Transport System and management ▶ Payroll
Sr. Officer - Accounting	Bachelor's degree in commerce/Accounting / Finance with M.Com. or MBA	5 Years	<ul style="list-style-type: none"> ▶ Experience in accounting and Taxation ▶ Should be familiar with latest accounting software 	<ul style="list-style-type: none"> ▶ Bookkeeping and accounting ▶ Financial analysis
Officer -	M. Com. or MBA	3 Years	<ul style="list-style-type: none"> ▶ Experience in accounting and Taxation 	<ul style="list-style-type: none"> ▶ Bookkeeping and accounting

Profile/ Designation	Minimum Qualification	Minimum Experience	Other Skill set/ requirements	Key Responsibilities
Accounting	or Equivalent in Accounting		<ul style="list-style-type: none"> ▶ Should be familiar with latest accounting software 	<ul style="list-style-type: none"> ▶ Handling of Cash, Banking etc.
Officer Store	Diploma in Mechanical or Equivalent	3 Years	<ul style="list-style-type: none"> ▶ Experience in Store keeping, including inventory management ▶ Experience in Computer systems / software for store keeping operation 	<ul style="list-style-type: none"> ▶ Managing store ▶ Issue of consumable and non-consumable stores and keeping records
Officer Procurement	M. Com. or MBA or Equivalent	3 Years	<ul style="list-style-type: none"> ▶ Experience in Procurement processes ▶ Knowledge of Govt. Procurement rules and processes will be desirable 	<ul style="list-style-type: none"> ▶ Procurement ▶ Vendor Development
Senior manager - Design & Consultancy	B.Tech or equivalent (Mechanical/Pro duction/Industri al Engineering)	10 Years with 5 years in similar role	<ul style="list-style-type: none"> ▶ 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 	<p>Responsible for designing tools, moulds and die casting w.r.t.</p> <ul style="list-style-type: none"> ▶ New product development planning and its execution ▶ Quality systems ▶ Value engineering ▶ Tool try outs and proving ▶ Consultancy to MSMEs <p>In charge of Incubation centre</p> <ul style="list-style-type: none"> ▶ 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 or equivalent (Mechanical/Pro duction/Industri al Engineering)	8 years with 3 years in a similar role	<ul style="list-style-type: none"> ▶ 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 	<ul style="list-style-type: none"> ▶ 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 or equivalent (Mechanical/Pro duction/Industri al Engineering)	5 Years	<ul style="list-style-type: none"> ▶ 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 	<ul style="list-style-type: none"> ▶ Designing tools, moulds and die casting ▶ Product development ▶ Quality systems ▶ Value engineering ▶ Tool try outs and proving ▶ Consultancy to MSME
Sr. Manager Production	B.Tech or equivalent	10 Years with 5 years in similar	<ul style="list-style-type: none"> ▶ Experience with tooling or manufacturing and at least 3 years of leadership 	<ul style="list-style-type: none"> ▶ Overall responsible for Production, production planning and control, including

Profile/ Designation	Minimum Qualification	Minimum Experience	Other Skill set/ requirements	Key Responsibilities
	(Mechanical/Production/Industrial Engineering)	role	<p>experience</p> <ul style="list-style-type: none"> ▶ 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 	<p>quality assurance of Tools and components, Tool trials etc.</p> <ul style="list-style-type: none"> ▶ 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
Manager- Production	B.Tech or equivalent (Mechanical/Production/Industrial Engineering)	8 Years with 3 years in a similar role	<ul style="list-style-type: none"> ▶ 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 	<ul style="list-style-type: none"> ▶ 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

Profile/ Designation	Minimum Qualification	Minimum Experience	Other Skill set/ requirements	Key Responsibilities
Manager- Production planning	B.Tech or equivalent (Mechanical/Pro duction/Industri al Engineering)	8 Years with 3 years in a similar role	<ul style="list-style-type: none"> ▶ 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 	<ul style="list-style-type: none"> ▶ 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 or equivalent (Mechanical/Pro duction/Industri al Engineering)	8 Years with 3 years in a similar role	<ul style="list-style-type: none"> ▶ 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- Testing	M.Tech/M.Sc.	8 Years with 3 years in a similar role	Practical Experience in Testing mechanical/Chemical/metallurgy	Head of Testing Department
Manager- Maintenance	B. Tech in Mechanical/	8 Years with 3 years in a	▶ Knowledge of Installation and commissioning of machines and	▶ Head of Machinery maintenance including preventive maintenance, repair etc. of

Profile/ Designation	Minimum Qualification	Minimum Experience	Other Skill set/ requirements	Key Responsibilities
	Electrical/ Electronic Engineering	similar role	equipment ▶ 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.	machines and equipment ▶ Responsible for Power supply, energy conservation water system in the campus
Senior Engineer- Production	B.Tech or equivalent (Mechanical/Pro duction/Industri al 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	B.Tech or equivalent (Mechanical/Pro duction/Industri al Engineering)	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	CNC machine programming and operation Assembly and trial of Tools

Profile/ Designation	Minimum Qualification	Minimum Experience	Other Skill set/ requirements	Key Responsibilities
			<ul style="list-style-type: none"> ▶ Tool assembly ▶ Tool trial 	
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	<p>Experience in Maintenance of machines and equipment (electronics or mechanical)/ Experience in CNC machine programming and operation/ Experience in Tool assembly and trial</p>	<ul style="list-style-type: none"> ▶ CNC machine programming and operation ▶ Assembly and trial of Tools ▶ Also work as Maintenance Technician in Mechanical/ Electronics
Senior Manager- Training	B.Tech or equivalent (Mechanical/Pro duction/Industri al Engineering)	10 Years with 5 years in a similar role	<ul style="list-style-type: none"> ▶ Experience with tooling / manufacturing and training in metal cutting / tool engineering / industrial automation systems ▶ Experience with designing curriculum and preparing lecture plans and course material for long term and short term training and teaching 	<ul style="list-style-type: none"> ▶ Overall responsible for planning and executing training activities ▶ Overall responsible for designing curriculum and preparing lecture plans and course material ▶ Responsible for Quality and Certification in training
Manager Training- mechanical/ Automation	B. Tech. (or equivalent) in Mechanical / Electronics or	8 years with 3 years in a similar role	<ul style="list-style-type: none"> ▶ Experience with tooling / manufacturing and training in metal cutting / tool engineering / industrial automation systems 	<ul style="list-style-type: none"> ▶ Planning and implementing of training activities in manufacturing and tooling, Mechatronics, IT etc. including market assessment to discover training demand

Profile/ Designation	Minimum Qualification	Minimum Experience	Other Skill set/ requirements	Key Responsibilities
	Electrical Engineering or Automation		<ul style="list-style-type: none"> ▶ Experience with designing of curriculum and preparing lecture plans and development of course material for long term and short term training and teaching 	<ul style="list-style-type: none"> ▶ Evaluation of training activities and identify improvements ▶ Curriculum design ▶ Lecture plans and course material
Senior Engineer- Incubation	B. Tech. Mechanical or Electronics/ Electrical	5 Year	<ul style="list-style-type: none"> ▶ Experience in incubation ▶ Experience with designing curriculum, lectures and organising workshops for entrepreneurs 	<ul style="list-style-type: none"> ▶ Undertake training courses for entrepreneurs
Engineer- Training	B. Tech. Mechanical or Electronics/ Electrical	3 Years	<ul style="list-style-type: none"> ▶ Experience in tooling / manufacturing and training in metal cutting / tool engineering / industrial automation systems and teaching 	<ul style="list-style-type: none"> ▶ Undertake training courses ▶ Demonstrate practical skills to trainees ▶ Deliver theory lectures
Manager- Sales & Marketing	B. Tech. in Mechanical Engineering preferably with MBA	10 years with 5 years in similar role	<ul style="list-style-type: none"> ▶ Marketing of TC product range ▶ Supporting Sr. Managers of respective departments to acquire orders ▶ Follow up with prospective and existing customers 	<ul style="list-style-type: none"> ▶ Plan and evaluate marketing activities towards all stakeholders ▶ Stakeholder analysis ▶ Sales according to targets
Sales Officer	BE/B. Tech with MBA or Equivalent	3 years	<ul style="list-style-type: none"> ▶ Marketing of TC Products ▶ Customer Follow-up & Complaints ▶ Should be familiar with Computerised accounting procedures ▶ Feed Back, Dues Collection 	<ul style="list-style-type: none"> ▶ Execute marketing and sales activities ▶ Sales invoicing, taxes etc.

Annex IV: Clearances Required and Respective Authorities

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 the development of TC, some of these regulations may not be applicable.

TABLE 30: CLEARANCES REQUIRED AND RESPECTIVE AUTHORITIES

SN	Required clearance/ approvals ⁴	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	<ul style="list-style-type: none"> • 30 days for up to 10 hectares • 60 days for above 10 hectares
5.	Land Allotment	Revenue Department	<ul style="list-style-type: none"> • 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		30 days
7.	Permission for felling of trees	Department of forest	35 days
8.	Issue of NOC to the authority concerned regarding conversion		15 days

⁴ Indicative list of clearances/ approvals

SN	Required clearance/ approvals ⁴	Department /agency	Tentative time limit for approval (days)
	of land use		
9.	NOC and Consent to Establish under Water and Air Pollution Control Acts	1. Municipal and Local authority 2. Uttar Pradesh Pollution Control Board	<ul style="list-style-type: none"> 90 days
10.	Consent to Operate (Consent of Air and Water Pollution)	Uttar Pradesh Pollution Control Board	<ul style="list-style-type: none"> Consent to operate:30 days, Renewal of consent: 30 days
11.	Authorization under the Hazardous Waste Management, Rule, 1989, if required	Uttar Pradesh Pollution Control Board	<ul style="list-style-type: none"> 60 days
12.	Electricity Connection	State Electricity Board	<ul style="list-style-type: none"> Loads up to 60 HP: 66 days, Loads 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
13.	Water connection	SIPB/DIPC	NA
14.	Fire safety	Fire department	15 days
15.	Approval of place and for permission to construct building under the Factories Act)		NA

SN	Required clearance/ approvals ⁴	Department /agency	Tentative time limit for approval (days)
16.	Approval of factory layout plan under factories Act, 1948	Labour and Employment Department – Factories and Boilers Inspectorate	30 days
17.	License for running the factory	Labour and Employment Department	45 days
18.	Registration of shops and commercial establishments	Labour and Employment Department - Labour Department	10 days
19.	Permission to establishments having more than 50 labours under Industrial Employment	Labour and Employment Department - Labour Department	45 days
20.	Lift	Kanpur Development Authority	NA
21.	Permit for Borewell (There is an onsite borewell for which approval needs to be taken)	Central Ground Water Authority	NA
22.	Society registration	Indian societies registration act 1860	NA