

# Enhancing role of SMEs in Indian defence industry



# Foreword

Small and Medium Enterprises (SMEs) play a vital role in the economic development of all countries worldwide. SMEs account for 90% of business establishments and half or more of the output and export share, and generate employment opportunities accounting for close to 70% of the labor force. Hence, it is no surprise that globally SMEs are an indispensable part of the supply chain in all major industrial sectors.

The global defence industry which is primarily dominated by a few Original Equipment Manufacturers (OEMs), works similarly in close co-ordination with SMEs and their prime contractors through a well defined supply chain. The reason why OEMs / prime contractors prefer to work with SMEs is because of their innovative capabilities in niche manufacturing, greater flexibility, lower overhead costs and their ability to learn and absorb new technologies.

OEMs require that the SMEs they work with should have the ability to perform, maintain continuity of supplies and clearly understand how the defence procurement procedure works. Hence, to be able to integrate successfully in the value chain, SMEs must try to develop niche products and capabilities, continuously innovate and fully leverage export opportunities that are now available to them under the Defence offset policy.

To be able to integrate in the supply chain, SMEs need to know their customers well, understand their requirements, gain their confidence and demonstrate a strong commitment to develop a long term business relationship. Such initiatives by SMEs coupled with government's policy to enhance the role of SMEs in the Indian defence industry, including participation in defence R&D, are the need of the hour if India is to emerge as one of the most important defence markets in the world. Recently the Prime Minister announced the constitution of a high-level Task Force for SMEs which is to inter-alia identify problems and issues that they face and take effective steps to resolve them. CII has a representation in this Task Force. I am sure this initiative of the Government of India taken at the highest level will result in constructive recommendations by the Task Force which would in turn lay the foundations for significantly increased SME participation across manufacturing industry including the defence sector.

CII has been playing an active role in the areas of steering defence policy formulation, market development, trade promotion and formulation of international joint ventures and technology transfers. It is with this objective that CII in partnership with Ernst & Young is publishing this report to highlight the issues relevant to SMEs in the aerospace and defence sector and the key actions that are needed to facilitate an enhanced role for them. I hope this report will encourage the government and industry to proactively address issues concerning SMEs in India and contribute in formulating a strategy for their significant participation in opportunities in the aerospace and defence industries.

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# Preface

SMEs are the key drivers of long-term sustainable growth. Empirical evidences also show a positive relationship between R&D investments, skilled labor and knowledge spillovers on the one hand and economic growth on the other. Further, globalization has also changed radically the geography of innovation, with new players, markets and opportunities emerging over the last two decades.

SMEs may have more impact on innovation than it would appear from their contribution to R&D activity. In sectors like the aerospace and defence industry, SMEs contribute most to innovation because of low scale of economies and the high importance of knowledge. Collective learning networks encourage innovation, especially for SMEs that lack the assets and resources to invest directly in R&D. In the current economic context, the ability to innovate and build entrepreneurial societies is even more compelling than before.

The aerospace and defence industry is of strategic importance to any nation. The Ministry of Defence acknowledges the fact that India needs to increase self reliance in its own national interest. On the other hand, the international defence industry today is global in nature with a complex network of global supply chains. Therefore, it is imperative for Indian companies, especially SMEs, to integrate themselves into the supply chains of national and international defence majors in order to reduce dependence on foreign supplies and also to gain a foothold in the international aerospace and defence market. India's offset policy will also go a long way in ensuring this objective in the long run.

The accomplishments and the contribution of the private sector to India's growth and development is being increasingly recognized by the Ministry of Defence. The recent amendment to the defence procurement procedures by incorporating a new category "Buy and Make (Indian)" is an ample example to this effect. Now, its time for the private sector to stand up to this challenge by leveraging its expertise, knowledge and networks from other industry sectors such as the automotive and the information technology sectors. SMEs would form a critical component of this exercise of building up a robust supply chain for the aerospace and defence industry.

In India, a large number of SMEs serve as suppliers to defence PSUs and have a role to play in the Indian defence market but their contribution has somewhere gone unnoticed. Hence, in order to achieve self reliance in defence production and subsequently emerge as a significant defence player, India needs to improve the competitiveness of its SMEs and enhance their role in the Indian defence industry, which is the focus area of this report.

We sincerely hope that you find this report insightful and useful. We would like to thank CII for inviting us to prepare this report, all stakeholders and industry players for their participation in its formulation, especially Major General (Retd.) Dr. Bhupinder Yadav of Q-Tech Synergy, who has been closely associated with us.

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# Abbreviations

AAP	Annual Acquisition Plan	IDF	Israel Defence Forces
Armcor	Armaments Corporation of South Africa	IPMT	Integrated Project Management Team
CAG	Comptroller and Auditor General of India	ITAR	International Traffic in Arms Regulations
CII	Confederation of Indian Industry	LTIPP	Long Term Integrated Perspective Plan
CSO	Central Statistical Organization	MoD	Ministry of Defence
DAC	Defence Acquisition Council	MRCA	Medium Multi-role Combat Aircraft
DAO	Defence Acquisition Organization	MRO	Maintenance, Repair and Overhaul
DARPA	Defence Advanced Research Projects Agency	MSME	Ministry of Micro, Small and Medium Enterprises
DCS	Direct Commercial Sale	NASSCOM	National Association of Software and Services Companies
DDP	Department of Defence Production	NCSIT	National Centre of Strategic Information Technology
DERA	Defence Evaluation and Research Agency	NDIA	National Defence Industrial Association
DGA	General Direction for Armament	NIP	National Industrial Participation
DGOF	Director General Ordnance Factory	NMCC	National Manufacturing Competitiveness Council
DGOS	Director General Ordnance Services	NSM	National Strategy for Manufacturing
DGQA	Directorate General of Quality Assurance	OFB	Ordnance Factory Board
DIPP	Department of Industrial Policy and Promotion	PPP	Public-private Partnership
DOFA	Defence Offset Facilitation Agency	R&D	Research and Development
DPB	Defence Production Board	R&T	Research and Technology
DPM	Defence Procurement Manual	RFP	Request for Proposal
DPP	Defence Procurement Procedure	RUR	Raksha Udyog Ratna
DPSU	Defence Public Sector Undertaking	SADF	South African Defence Force
DRDO	Defence Research and Development Organization	SCAP	Services Capital Acquisition Plan
DRST	Directorate for Research, Studies and Techniques	SCAPHC	Services Capital Acquisition Plan Categorization Higher Committee
DSTL	Defence Science and Technology Laboratory	SDIF	Strategic Defence Industry Fund
EDA	European Defence Agency	SIPRI	Stockholm International Peace Research Institute
FDI	Foreign Direct Investment	SME	Small and Medium Enterprises
FERV	Foreign Exchange Rate Variation	SSE	Small-scale Enterprises
FMS	Foreign Military Sale	SSI	Small-scale Industries
GDP	Gross Domestic Product	STC	State Trading Corporation
GVC	Global Value Chain	TE	Tender Enquiry
IAI	Israel Aircraft Industry	TOT	Transfer of Technology





## Introduction

This report is an attempt to highlight means and measures necessary to enhance the participation of SMEs in Indian defence production. The report begins with highlighting relevance of SMEs as they constitute over 90% of all enterprises in most economies including India and are engines of economic growth and equitable development. They are credited with generating the highest rates of employment growth and account for a major share of industrial production and exports. By adding capacities and supplying cost efficient quality goods, SMEs play a key role in the development of economies. As new technologies and globalization reduce the importance of economies of scale, the potential contribution of smaller firms is increasingly enhanced. SMEs take emerging markets toward higher growth and enhance their international competitiveness. Considering the growing influence of SMEs, they can contribute significantly to the Indian defence sector and national endeavor of self reliance.

India ranks among the top 10 countries in the world in terms of military expenditure. The country's cumulative defence budget (capital plus revenue expenditure) has grown at 11.5% CAGR during FY06-09 to USD26.5 billion. However, around 70% of defence procurements are made by way of imports. In case of indigenous production, a substantial portion of production continues to be under government's jurisdiction on account of the critical and sensitive nature of the sector and a belief

that the private sector does not have the requisite capability. A large percentage of the sub-systems and components of primary equipment were manufactured through backward integration in Ordnance Factories (OFs)/ Defence Public Sector Undertakings (DPSU) through feeder factories / companies' own captive units and private sector engagement was only restricted to sourcing of parts and components.

The government proposes to source 70% of its defence requirements from indigenous suppliers by 2010. However, given the sensitivity of the sector involved, required headway has not been made in this direction. Accordingly, a series of measures have been introduced by Ministry of Defence (MoD) to strengthen the acquisition process, defining time lines and enhancing the level of transparency and accountability in the defence acquisition and procurement process. In May 2001, MoD opened the defence production to private sector with 100% equity participation and a limited Foreign Direct Investment (FDI) upto 26%, both subject to licensing restrictions. In 2006, MoD introduced the Defence Procurement Procedures (DPP) to streamline the defence acquisition process which has been further updated by DPP 2008 and recently by DPP 2009.



With such initiatives and technological advancement, private sector participation has received a boost. However, the potential private sector and SME contribution in defence still remains to be fully realized.

This report focuses on the procurement policy of MoD and its impact on the industry in general and SME participation, in particular impact of offset on SMEs, role of DOFA, indigenization and the market opportunities for SMEs. In this regard, views and opinions expressed by SMEs under a joint survey organized by CII and Ernst & Young have also been compiled and incorporated while framing the recommendations.

The report further highlights the Kelkar Committee's recommendations, the level of its implementation, the need to strengthen self-reliance in defence preparedness, reasons for the slow progress of public-private partnership and the importance of ensuring a level playing field for the private players.

The report also gives a cross country comparison of defence industries, highlighting the policies and changes made by SMEs to adapt themselves to the changing world economic and social scenario and how India could learn from it. Globally, the defence Industry is witnessing an enhanced focus on organization-wide learning process followed by development of a whole new network of tier-II and III partners. Global economic slowdown combined

with the pressure to cut costs is forcing manufacturers to shift base to low cost countries such as India and China. India as a destination offers high productivity and quality goods and services at competitive prices. Given the above, SMEs in India have the potential to play a key role in global manufacturing by leveraging lower cost and increasing local demand.

Recent amendments to the DPP are expected to promote indigenous manufacture of defence equipment and help India emerge as a global manufacturing hub for defence equipment. With the process of internationalization and competitiveness becoming need of the hour, Indian defence industry and the defence procurement has to become increasingly collaborative with the private sector and SMEs in order to enhance the capabilities and core competencies in the emerging military technology sectors. Such arrangements will establish long-term supply chains and consequently establish long-term relationships with both defence related companies and the government.



# 1 SMEs in India



## Introduction

SMEs constitute over 90% of all enterprises in most economies and are engines of economic growth and equitable development. They are credited with generating the highest rates of employment growth and account for a major share of industrial production and exports. They also play a key role in the development of economies with their effective, efficient, flexible and innovative entrepreneurial spirit. As new technologies and globalization reduce the importance of economies of scale, the potential contribution of smaller firms is increasingly enhanced. SMEs take emerging markets toward higher growth and enhance their international competitiveness.

### SMEs in India

The socio-economic policies adopted by India since the Industries (Development and Regulation) Act 1951 have laid stress on SMEs as a means to improve the country's economic conditions. The government earmarked a special role for SMEs in the Industrial Policy Act, 1951, with special provisions for their protection. The policies emphasized judicious use of foreign exchange for the import of capital goods and inputs, a labor-intensive mode of production, generation of employment, avoidance of concentration of economic power, discouraging monopolistic practices of production and marketing, and effective contribution of SMEs to foreign exchange earning with low import-intensive operations, keeping in mind their focus and growth.

Nevertheless, the size and scale of the Indian SME sector continues to be uncertain, specifically in the backdrop of the new definition of the sector introduced in 2006 and also because of a large number of unregistered units in the unorganized sector. It is estimated that there are over 13 million micro, small and medium-sized enterprises in the country today, which comprise 95% of all industrial units.

## Regulation

SMEs need a free and fair environment to encourage growth and innovation. The current government policy focuses on abolishing state supervision of SMEs and providing an environment that is conducive for the sector to grow and meet challenges.

### The Micro, Small and Medium Enterprises Development Act, 2006 (MSMED Act 2006)

MSMED Act was enacted in 2006 to address policy issues affecting SMEs as well as the coverage and investment ceiling of the sector. The salient features of the act include<sup>[2]</sup>:

- Creation of a national board of SMEs
- Proper classification of enterprises
- Advisory committee to support SMEs
- Measures for promotion, development and enhancement of SMEs
- Scheme to control delayed payments to SMEs
- Scheme for closure of SME businesses
- Enactment of rules by state governments to implement the MSMED Act, 2006 in their respective states

On 9 May 2007, subsequent to an amendment of the Government of India (Allocation of Business) Rules, 1961, the Ministry of Small Scale Industries and the Ministry of Agro and Rural Industries was merged to form the Ministry of Micro, Small and Medium Enterprises (MSME)<sup>[2]</sup>. This ministry now designs policies, programs, projects and schemes and monitors their implementation with a view to assist SMEs and help them scale up.

## Exhibit 1: Definition of SME by the Micro, Small and Medium Enterprises Development Act, 2006

Type	Investment ceiling for plant, machinery and equipment	
	Manufacturing enterprise	Service enterprise
Micro	Up to INR2.5 million	Up to INR1 million
Small	INR2.5-50 million	INR1-20 million
Medium	INR50-100 million	INR20-50 million

Source: Ministry of MSMEs <sup>[2]</sup>

### **National Manufacturing Competitiveness Council (NMCC)** <sup>[2, 9]</sup>

To enhance productivity, competitiveness and employment generation in the manufacturing sector, the Government of India set up the NMCC in October 2004, to serve as a forum for coherent policy initiatives. In March 2006, NMCC formulated a National Strategy for Manufacturing, 2006 (NSM 2006), aimed to sustain a 12% rate of growth in the manufacturing sector, and needed to support an overall economic growth rate of 8-9%. NSM 2006 recognized the unique role of SMEs and made detailed recommendations to the government. Most of these recommendations have been accepted and are being implemented.

The competitiveness of firms and the country as a whole depends on the internal efficiency, policy framework and ecosystem required to nurture and develop the sector. The following key characteristics were observed in the policies followed by eight countries (Korea, Taiwan, Singapore, Hong Kong, Malaysia, Thailand, Indonesia and China) for achieving industrialization.

- ▶ The robust growth of manufacturing was central in their growth model.
- ▶ Governments intervened through policy actions to support the manufacturing sector, to withstand competition, especially external competition, enabling the sector to grow over a long period of time.
- ▶ Special attention was given to SMEs to make them competitive and technology-driven.
- ▶ The industry was intensively involved in the process of formulation and implementation of the industrial policy.
- ▶ Effective mechanisms were put in place to ensure that the goal of achieving manufacturing growth and technology development received close attention and that appropriate actions were taken in time.

In almost all the countries surveyed, SMEs have played a prominent role as useful partners in the international supply chain as well as innovators and high technology developers.

The NMCC, in its report submitted in 2008, made a special recommendation in favor of small and medium-scale manufacturing industries. "Small and medium industries form the backbone of the manufacturing sector, not only in this country but also in developed countries. In India, the small-scale sector contributes 40% of manufacturing. It also contributes about 34% of exports. Ensuring that the

small-scale sector grows at a healthy rate is crucial for the overall growth of the manufacturing sector and the national economy. For this to happen, the small scale sector has to be competitive. The sector is heterogeneous, dispersed and substantially unorganized. To obtain economies of scale, mergers and acquisitions may be required. There are also other ways in which competitiveness can be achieved by small scale industries. The SMEs in order to ensure long term growth would have to diversify and become crucibles for technology development.

Most of the reserved items and incentives to SMEs have however been withdrawn gradually. The government has designed a program to enhance competitiveness. If approved and implemented, it would be beneficial for SMEs.

Lastly, a review of the requirement for new and more sophisticated manufacturing capabilities, in the background of India's emergence as a major economic power and its aspirations, also requires due focus."

### **Relevance of SMEs**

#### **Social and political perspective**

To sustain the growth of a largely agriculture-based Indian economy, the growth of other sectors such as industry, services and manufacturing is imperative. An inter-sectoral shift from agriculture to the industry and services sectors is part of the natural growth of any economy. The share of the services sector in India's GDP has risen from 40% in 1980 to 53% in 2008. However, during the same period, the share of the manufacturing sector has only risen from 26% to 29%. Thus, the role of manufacturing and SMEs, in particular, is significant for the country's transition from a predominantly agricultural economy to a service oriented one. The growth of the SME sector can contribute to India's economic prosperity through its significant impact on poverty reduction, employment generation, social influences, development and uniform wealth distribution.

#### **Incubation of entrepreneurship**

In their initial years, almost all enterprises are SMEs. Their capital investment per unit of output is also low, making it financially viable for them to act as incubation laboratories for the economy. SMEs are an integral part of the supply chain of large-scale industries and provide vital forward and backward linkage to the overall industrial sector.

## Employment

SMEs have an edge because their employment potential is maintained at a low capital cost. The national objective of inclusive growth can be fulfilled only by SMEs through the creation of highly productive labor-intensive jobs, direct and indirect. During FY08, 3 million people were provided with employment in the SME sector<sup>[2]</sup>. The employment generation capability of the SME sector is estimated to be almost four times that of large enterprises for a given investment.

### Exhibit 2: Employment and production-generation capacity<sup>[7]</sup>

Year	SMEs		Overall economy	
	Investment to production ratio	Employment per INR10 million of Investment	Investment to output ratio	Employment per INR10 million of Investment
FY03	0.57	157.0	0.26	76.5
FY04	0.54	155.5	0.26	70.8
FY05	0.49	154.4	0.27	58.9
FY06	0.44	152.3	0.31	44.0
FY07	0.40	151.4	0.34	37.4
FY08P	0.35	150.7	0.36	N.A.

Source: Emerging SMEs of India 2008, D&B

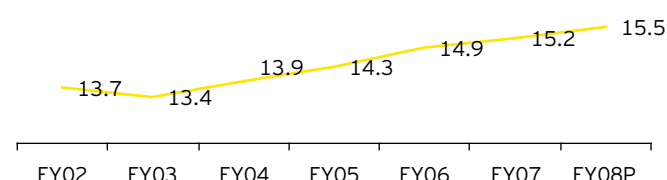
## Localized socio-economic development

A low investment requirement encourages local entrepreneurship, employment and livelihood opportunities and helps to stem migration to a certain extent. Generally, SMEs produce from natural and local resources, utilizing local skills, acting as a catalyst in not only increasing local employment and consumer growth around their geographic areas, but also by developing the entire region. Goods and services produced by SMEs not only meet the needs of society, but also bring about social transformation in terms of consumerism and socio-economic development.

## Contribution to economic value chain

SMEs play a pivotal role in the economic growth of a country. As large firms outsource more of their value-added functions, SMEs get the opportunity to climb up the value chain. Further, increased competition improves the productivity and competitiveness of firms. This process involves high job turnover rates, which is a quintessential part of the competitive process and structural change.

### Exhibit 4: Contribution of SMEs to India's GDP, FY02-08P



Source: MSME<sup>[2]</sup> and CSO

### Exhibit 3: SME sector in India, key growth indicators, FY03-07

Year	Number of units (million)	Investment (INR trillion)	Production (INR trillion)	No of persons employed (million)	Export (INR trillion)
FY03	10.9	1.7	3.1	26.4	0.9
FY04	11.3	1.8	3.6	27.5	1.0
FY05	11.8	1.9	4.3	28.7	1.2
FY06	12.3	2.0	5.0	29.9	1.5
FY07	12.8	2.1	5.8	31.2	1.6
FY08	13.3	N.A.	6.9	32.0	N.A.

Source: MSME FY08 annual report; Business India Survey <sup>[2, 3]</sup>

## Contribution of SME sector

- ▶ 15.5% of GDP
- ▶ 30-40% of value-addition in manufacturing, valued at USD5 billion
- ▶ 50% of the industrial output
- ▶ Expected to employ 42 million by 2010
- ▶ 55% of rural employment
- ▶ Percentage share of SME sector in total exports (currently 40%) is decreasing; total exports from the sector risen from USD 17.8 billion in FY03 to USD37.8 billion in FY07



### Industrial growth

In recent years, the SME sector has consistently registered a higher growth rate as compared to the manufacturing and industrial sector. SMEs drive industrial growth by augmenting capacities and supplying quality goods and services at competitive prices. With increasing globalization, a large number of SMEs have expanded their reach outside India. Today, exports account for 40% of the revenues generated in the SME sector. However, the current slowdown in the global economy has dampened exports with the demand for products and services exported to the US and European countries seeing a decline.

**Exhibit 5: Growth rate of GDP, manufacturing, industry and SME, FY01-08, in %**

Year	GDP	Manufacturing	Industry	SME
FY01	4.4	7.7	6.4	8.1
FY02	5.8	2.5	2.7	8.3
FY03	3.8	6.8	7.1	8.7
FY04	8.5	6.6	7.4	9.6
FY05	7.5	8.7	9.8	10.9
FY06	9.0	9.1	9.6	12.3
FY07	9.2	11.3	10.0	12.6
FY08	8.7	9.4	8.3	13.0

Source: Economic Survey 2006-07 and Office of the Development Commissioner

### Challenges to SMEs in India

In the current unprecedented financial crisis not only SMEs, but all stakeholders in the economy have been impacted adversely. In this process, SMEs are also facing an uphill task to manage operating profitability, access to adequate risk or debt capital and availability of professional help or advisory services to deal with crises situation. In such a scenario, Government intervention is needed in mitigating the following challenges faced by SMEs:

- ▶ **Access to markets:** SMEs do not have exposure to national and international markets, secondary market instruments, technology and product innovations and best global practices. This impacts the profitability and growth of SMEs.
- ▶ **Access to information and business development services:** SMEs are inward looking and do not have access to beneficial information and business management tools to enhance their businesses.

- ▶ **Non-recovery of dues/payments from large-scale buyers**
- ▶ **Competition:** SMEs are witnessing increased competition in domestic and export markets. This has resulted in companies enhancing their operating efficiencies and adopting the latest available technology.
- ▶ **Financing challenges:** Lack of adequate and timely finance has been a perennial cause of sickness in the SME sector. SMEs have not been able to fully exploit their potential due to low credit penetration because of sub-optimal delivery of credit and services.

Approximately, 90% of the SME units are not registered and around 95% do not have access to formal institutional credit. Out of the total 2.3 million units registered in FY02, only 0.11 million units (14.9%) had access to formal institutional credit.

The share of micro and small enterprises in bank's total credit flow has declined from 14.2% in FY01 to 10.9% in FY08. Till February 2009, the lending rate to the SMEs was at a high of 14%, forcing them to rely on internal accruals and non-institutional credit. During FY2000-08, credit flow to micro and small enterprises from PSU banks has increased from INR460.4 billion to INR1,486.0 billion. During the same period, net bank credit increased from INR3,164.3 billion to INR16,197.4 billion.

### Credit Guarantee Fund Trust for Micro and Small Enterprises (CGTMSE)<sup>[2]</sup>

Launched by the Government of India as a value-added service, the CGTMSE ensures the availability of collateral-free credit for the micro and small enterprise sector. Cumulatively, as of 31 March 2009, the corpus of the CGTMSE, established by the Government and SIDBI, is in the ratio of 4:1, respectively, has approved 150,034 guarantees amounting to INR48.2 billion. During FY09, the trust extended 53,708 credit guarantee approvals aggregating INR22 billion, registering a y-o-y growth of 77% in number of guarantees and 108% in amount of guarantees.

The lending institutions, eligible under the scheme, are largely scheduled commercial banks and select regional rural banks. As of June 30 2008, there were 65 member lending institutions of the CGTMSE, comprising 28 public sector banks, 14 private sector banks, 20 regional rural banks and 3 other Institutions, NSIC, NEDFI and SIDBI. During FY09, 21 banks/lending institutions registered with the trust as new members. The credit facilities that

are eligible to be covered under the scheme include term loans and working capital facility up to INR10 million per borrowing unit, extended without any collateral security or third party guarantee, to a new or existing MSME.

## Emerging trends

### Cluster development <sup>[6]</sup>

Public-private partnerships (PPPs) and SME clusters are the key drivers of the growth of the SME sector. Local SME clusters pool resources and are more flexible and responsive to customer needs as compared to large enterprises. Further, clusters facilitate technology and personnel-sharing and create opportunities for enhanced efficiency in organizations.

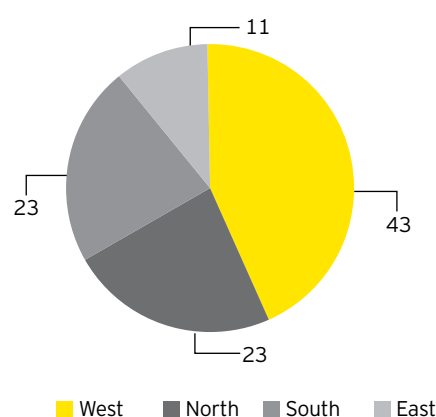
At present, there are around 400 Small Scale Enterprises-based, 2,000 rural-based and 900 artisan-based clusters in the country. A cluster consists of groups of associated and interconnected firms that are linked vertically and/or horizontally through the similarity of their products, services, input, technologies, transportation, warehouses and communication. These similarities result in interrelationships and trust, which build collective efficiency.

Clusters came into existence due to the advantages they provide to the participants:

- ▶ **Productivity:** Access to employees and suppliers, specialized information, complementary activities, institutions and public goods.
- ▶ **Innovation:** A window for customers, enhancing the learning of companies about technology components, machinery availability, service and marketing concepts, providing capacity and flexibility.
- ▶ **Formation of new business firms:** Concentrated, customer-based, individuals working within a cluster are more easily perceptive of gaps in products or services around which they can build businesses, ensure easier availability of resources and encourage networking among firms.

The largest concentration of clusters are in Western India, which accounts for 54.3% of the total number of SME units in the country. Maharashtra, Gujarat, Punjab, Rajasthan, Tamil Nadu and Haryana, have the maximum number of clusters.

**Exhibit 6: SMEs in India, by geography, in %**



Source: SMERA Newsletter, March-May 2008

### Successful SME Clusters in India

The details of some successful SME clusters in India are as under:

**Pune auto cluster:** This project was set up under the Industrial Infrastructure Upgradation Scheme of the Department of Industrial Policy and Promotion (DIPP), Ministry of Commerce and Industry, along with the Pimpri-Chinchwad Municipal Corporation, with an investment of INR1.2 billion.

**Bangalore technology cluster:** Bangalore is the fourth-largest technology cluster in the world after Silicon Valley, Boston and London. It employs about 0.3 million professionals. This cluster recorded exports of USD8.4 billion in FY06, which is expected to increase to USD18 billion by 2010.

Some other successful clusters are in Howrah (foundry), Khurja (pottery), Ferozabad (glassware), Faridabad (auto components), Pune (auto components), Panipat (textiles), Bikaner (ceramics) and Jamnagar (castings made of brass).

## SMEs in defence sector in India

The role of SMEs in the framework of globalization has changed considerably. In the context of the processes of social and economic globalization, following characteristics of SMEs need to be kept in mind:

(i) There are certain distinctive characteristics of SMEs (flexibility, great diversity, low cost inputs etc) which make them highly competitive as producing units.

(ii) The present global trends (knowledge, innovation, downsizing, networking, globalization) have reduced the gap that once separated large enterprises and SMEs.

Technology is fast changing in today's world and defence related technology is not an exception. To keep the Armed Forces in a state of readiness and equipped with the latest technology, the defence acquisition policy of the nation has to have a two-tiered approach: a) to continue to look forward to the new technologies in the world and, with the help of Indian scientists and engineers, imbibe them into the system and b) to maintain, replace and meet regular requirements of the varied defence equipment in demand so as to be less and less dependent on foreign imports.

Towards this end, the timely updating of technology is necessary and it is easier to upgrade the smaller private production units, as compared to public ones. In such a scenario, it is not surprising that in spite of not having the requisite economic size, SMEs have entered in diverse fields including the very high-tech defence sector.

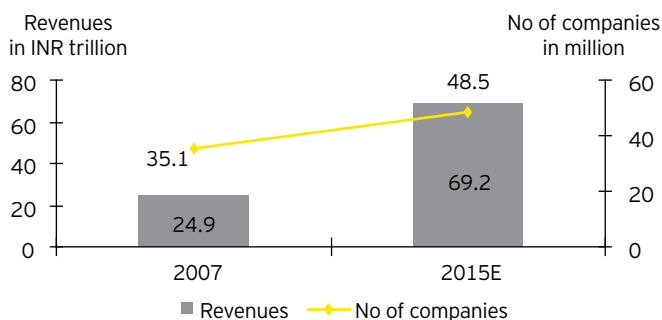
With the opening of defence industry in India, private participation in the defence sector would help in transforming India into a defence industrial base, capable of producing world class products at highly competitive prices. SMEs can play a significant role in this as they have the capability to produce sub-systems and components of primary equipment.

Technology partnership as a new strategy of cooperation could also help in tapping the potential of SMEs. An evaluation of the PPPs in the defence sector in UK indicates that this partnership gives the government access to private sector capital to exploit its technologies and capabilities into wider markets for the benefit of the economy. The agencies like Defence Research and Development Organization (DRDO) with its advanced R&D facilities can, therefore, look for strategic subcontracting of production in various projects among SMEs.

## Outlook

According to The National Association of Software and Services Companies (NASSCOM), the number of companies in the SME sector is expected to register a CAGR of 4% till 2015 to reach 48.5 million. The revenues of the companies in the SME sector are expected to grow by 12% annually to reach INR69.2 trillion in 2015.

**Exhibit 7: SME revenues and number of companies, 2007-15E**



Source: NASSCOM

## Trends

- ▶ SMEs are witnessing increased competition in domestic and export markets. This has resulted in companies enhancing their operating efficiencies and adopting the latest available technology.
- ▶ The global economic slowdown is hampering the growth of SMEs in India. Availability of credit to SMEs has seen a significant decline as banks are unwilling to extend credit to such companies due to their higher risk profile. This has curtailed the capital expenditure of SMEs and also adversely impacted their working capital requirements.
- ▶ With increasing globalization, a large number of SMEs have expanded their reach outside India. Today, exports account for 40% of the revenues generated in the SME sector. However, the slowdown has dampened exports with the demand for products and services exported to the US and European countries experiencing a decline.
- ▶ Recent depreciation of the Indian rupee vis-à-vis foreign currencies such as the US dollar has helped to increase the profitability of exports. This is, in turn, resulting in increased competition in the sector.



Globalization and liberalization, along with the WTO regime, have left a strong imprint on Indian SMEs. To add to this, are the challenges presented by the economic slowdown and enhanced competition from low cost centers. However, SMEs have responded by cutting costs, revamping their management, focusing on designing new products and relying on low labor costs and technology. The new environment has forced them to explore possibilities of using a shared model, collaborating and seeking funding and research support from their large customers. For example, the auto component manufacturers supplying to Maruti gain from the latter's support (Maruti's support to vendor development is a case study by itself).

There are significant opportunities for outsourcing, sub-contracting and ancillarization of the products manufactured by corporate organizations, particularly in sectors such as automobiles, engineering, defence and consumer electronics. Indian SMEs need to revitalize and institutionalize change to enhance their skill base across distinct business processes.

Their people need to equip themselves with multiple skill sets, be provided with the opportunity for job rotation and integrate with other business functions such as manufacturing or marketing. In addition, the government, industry and policy makers need to partner with them in their road to progress.

SMEs should be viewed as partners for progress. A vibrant SME sector can derive the maximum benefits with contemporary developments. SMEs with a strong technological base, an international business outlook, a competitive spirit and a willingness to restructure can withstand the challenges being faced by them today and emerge with flying colors to make their contribution to the Indian economy and defence sector in particular.

### Key findings

- ▶ From a macro perspective, the SME sector contributes significantly to India's economic prosperity through its major impact on employment generation, social influences, development and uniform wealth distribution.
- ▶ SME clusters promote productivity, innovation and entrepreneurship at the micro level and provide networking and business synergy opportunities.
- ▶ Currently, SMEs in India contribute 50% of the industrial output and 40% of total exports
- ▶ SMEs in India face various challenges in the form of shortage of credit, proper access to market and business information. There is urgent need for policy intervention to support these SMEs in sustaining and enhancing their business competitiveness.

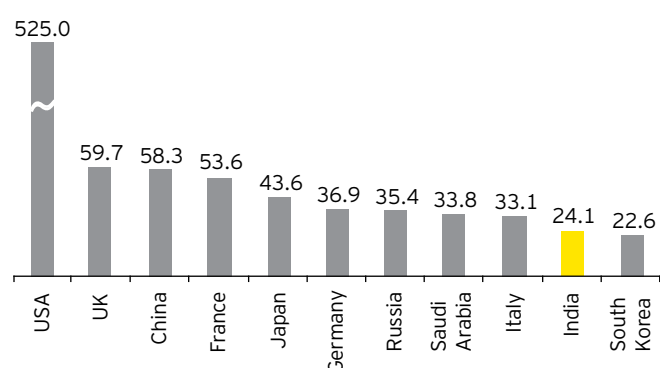


## 2 Indian defence industrial base



India's military expenditure accounts for 80% of South Asia's total military expenditure and its defence industrial base is currently the second-largest industry after its railways.

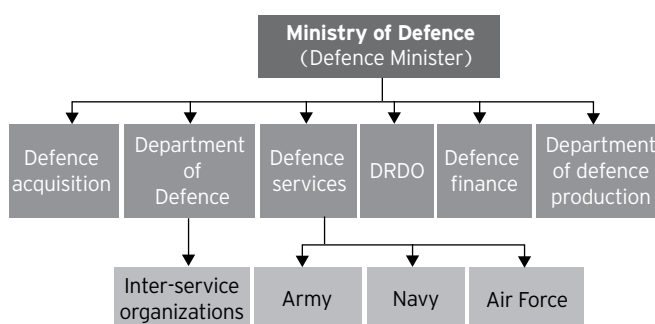
**Exhibit 8: military expenditure, countrywise, 2008, in USD billion**



Source: The 15 Major Spender Countries in 2007, SIPRI 2008

The MoD<sup>[15]</sup> provides the policy framework and wherewithal to the armed forces, to discharge their responsibilities pertaining to the country's defence. India's defence-planning system is under the ambit of its MoD, which is the co-ordinating body for defence production and R&D in the country. The main departments concerned with defence production are the Defence Acquisition Organization, the Department of Defence Production and the Defence Research and Development Organization.

**Exhibit 9: MoD organizational structure**

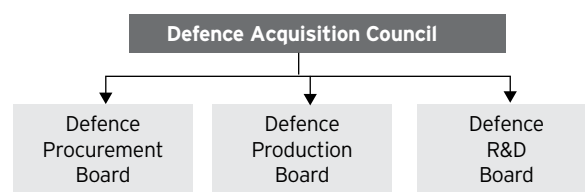


Source: MoD<sup>[15]</sup>

#### Defence Acquisition Organization (DAO)<sup>[15]</sup>

DAO has been set up to improve time and cost management across all acquisition processes in India. It comprises four key bodies and an acquisition wing.

**Exhibit 10: DAO organizational structure**

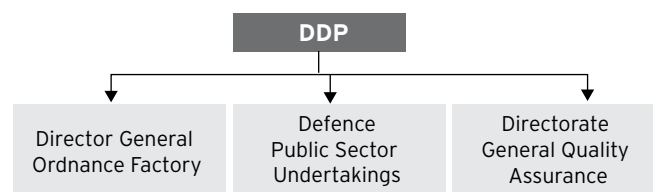


Source: MoD

#### Department of Defence Production (DDP)<sup>[15]</sup>

DDP directs and coordinates the production of material and equipment required by the armed forces. As a result of legislation introduced in 1948 and 1956, the defence sector has been under state control, while the participation of the private sector in defence production has been restricted. The main constituents under DPP are as under:

**Exhibit 11: DDP organizational structure**



Source: MoD<sup>[15]</sup>

#### Director General Ordnance Factory (DGOF)

Ordnance factories were established 200 years ago as departmental manufacturing units with the main purpose of meeting the requirements of the armed forces. The production lines of ordnance factories are product-specific. The DGOF has five operating divisions, based on technology groupings, and each group of factories is headed by a Member/Additional DGOF. These include:

**Exhibit 12: DGOF operating divisions**

Division	Number of factories
Ammunition and Explosives (A&E)	11
Weapons, Vehicles and Equipment (WV&E)	10
Materials and Components (M&C)	11
Armoured Vehicles (AV)	3
Clothing, Equipment and General Stores (OEF)	5

Source: MoD<sup>[15]</sup>



## Defence Public Sector Undertakings (DPSUs)<sup>[15]</sup>

DPSUs were established either by taking over existing facilities or by setting up new corporate organizations. The objective of establishing DPSUs under the MoD was to build a strong and diversified production base to produce specialized equipment such as electronic communication equipment, warships, missiles, armaments, and the aircraft and equipment needs of the Army, Navy and Air Force. DPSUs have a flexible form of operation, decentralized management and adequate operational autonomy. Eight undertakings have been set till date:

- ▶ Hindustan Aeronautics Ltd. (HAL), Bangalore
- ▶ Bharat Electronics Ltd. (BEL), Bangalore
- ▶ Bharat Earth Movers Ltd. (BEML), Bangalore
- ▶ Mazagon Dock Ltd. (MDL), Mumbai
- ▶ Garden Reach Shipbuilders & Engineers Ltd. (GRSE), Kolkata
- ▶ Goa Shipyard Ltd. (GSL), Goa
- ▶ Bharat Dynamics Ltd. (BDL), Hyderabad
- ▶ Mishra Dhatu Nigam Ltd. (MIDHANI), Hyderabad

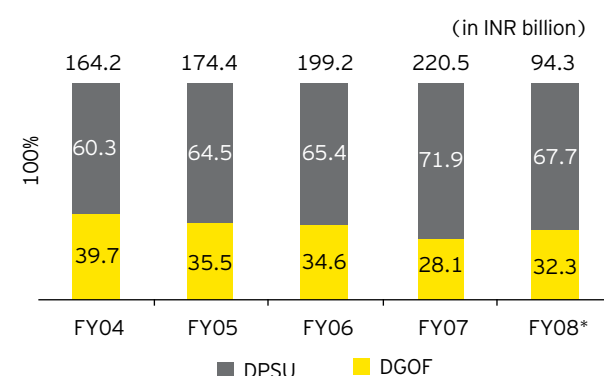
## Defence Research and Development Organization (DRDO)

DRDO is headed by the Scientific Adviser to the Defence Minister. Its main responsibilities include R&D planning and advising the Defence Minister on the scientific aspects of military equipment. The organization employs around 25,000 people (around 6,000 being scientists and engineers and around 10,000 being technicians). DRDO draws on the work of 52 laboratories and establishments across the country, and has close links with DPSUs. It also co-operates with 70 academic research institutions, 50 national science and technology centers and some companies in the private sector.

## Production

The total value of production from DDP has risen at a CAGR of 10.3% from INR164.2 billion in FY04 to INR220.5 billion in FY07. During FY08 (April-November), the total value of its production reached INR94.3 billion. DGOF's share of the total production has declined from 39.7% in FY04 to 32.3% in FY08, while the share of DPSUs has increased from 60.3% to 67.7% during the same period.

**Exhibit 13: DDP production contribution, by organization, FY04-08, in %**



\* Up to November 2007

Source: MoD<sup>[15]</sup>

## Exports from DDP

The export market size and share reflects the sustainability and competitive edge of an industry. The defence industry has not fared well on this count due to lack of technology and competitive pricing, the existence of a negative list of countries where the export of defence equipment cannot be explored, the large number of clearances required,

**Exhibit 14: Indian defence exports**

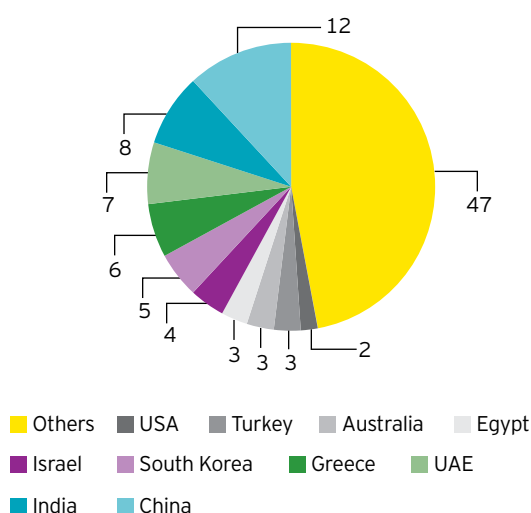
Year	Exports (In INR billion)	% of total production (in %)	Source
FY03	3.0	1.9	Consolidated figure from MoD annual report
FY04	2.4	1.5	Consolidated figure from MoD annual report
FY05	4.2	2.4	Consolidated figure from MoD annual report
FY06	N.A.	N.A.	-
FY07	3.2	1.5	HAL: INR2.7 billion; BEL: INR500 million
FY08	4.2	NA	BEL: INR600 million; BEML: INR1.1 billion; HAL: INR2.5 billion

Source: MoD<sup>[15]</sup>

stipulation of the “End Use Certificate” and lack of thrust on marketing efforts.

India’s show of numbers in the area of defence exports is inadequate and is pegged at an average of 1.5-2.5% of its total production; 3% for DPSUs and 1% for the DGOF. The output is also insufficient and is not reflected in the MoD’s annual reports. The Indian defence industry’s export-import ratio is lower than those of countries with a much smaller defence industrial infrastructure <sup>[15]</sup>.

**Exhibit 15: top 10 arms importers, 2003-07, in %**



Source: SIPRI Data Base<sup>[16]</sup>

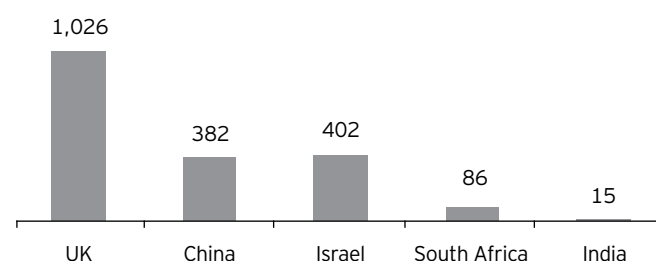
**Exhibit 16: Defence export and import, by country, 2001-04**

The performance of India’s defence exports is highlighted in the table and diagram below:

Country	Imports (In USD million)	Exports (in USD million)	Import: export ratio
India	8,526	44	194:1
Israel	1,675	1,290	1.3:1
South Korea	2,755	313	8.8:1
Singapore	1,441	73	19.7:1

Source: SIPRI Database, 2005<sup>[16]</sup>

**Defence export comparison, in USD million**



Source: SIPRI Database, 2005<sup>[16]</sup>

**India’s defence imports and exports comparison, in USD million**



Source: SIPRI Database, 2005<sup>[16]</sup>

### Procurement from private sector

The DGOF sources around 45% of its total purchases in the form of raw material, components and sub-systems through indigenous sources. On an average, the government sector, small- scale sector and other private sector supplies 23%, 42% and 35% respectively, of indigenous purchases. Although no such data is available for DPSUs, experts estimate a similar pattern of procurement in the private sector.

Although no single source provides information on the procurement of spare parts and replacements, the DGQA, which is a common agency for all the three armed services for most of the spares, has valued indigenous stores (Exhibit 18). A similar pattern is expected for procurement by the public sector from the private sector.

**Exhibit 17: DGOF procurement, in INR billion**

Year	Value of issue	Indigenous purchase (% of total issue)	Indigenous purchase break down (% of total issue)			Imports (% of total issue)	Total purchase
			Government sector	SSI	Private sector		
FY02	61.0	24.6 (40.26%)	2.8 (4.65%)	5.6 (9.26%)	16.1 (26.34%)	2.7 (4.45%)	27.3
FY03	65.0	25.7 (39.5%)	5.5 (8.38%)	6.1 (9.33%)	14.2 (21.81%)	6.2 (9.56%)	31.9
FY04	65.0	25.5 (39.1%)	6.1 (9.30%)	6.2 (9.52%)	13.2 (20.35%)	12.1 (18.6%)	37.6
FY05	61.8	27.4 (44.2%)	5.6 (9.05%)	7.6 (12.33%)	14.1 (22.82%)	4.8 (7.75%)	32.2
FY06	68.9	31.0 (45.02%)	6.5 (9.43%)	8.5 (12.36%)	16.6 (24.1%)	5.1 (7.42%)	36.8
FY07	62.3	27.4 (44%)	6.3 (22.78%)	10.4 (37.98%)	10.8 (39.22%)	4.4 (15.93%)	31.8
FY08	70.0	32.1 (45.91%)	7.6 (23.64%)	13.5 (42.12%)	11.0 (34.22%)	7.9 (24.67%)	40.1
FY09	76.7	35.3 (45.95%)	8.1 (22.97%)	14.5 (41.13%)	12.7 (35.88%)	7.5 (21.27%)	42.8

Source: DGOF

**Exhibit 18: Value of indigenous stores accepted, in INR billion**

Year	OFB	DPSU	Non DPSU	Large enterprises	SSI
FY05	96.6	25.5	3.5	15.0	12.6
FY06	86.5	29.4	3.2	11.6	8.7
FY07	58.7	29.1	1.7	13.7	10.0
FY08	62.8	34.5	1.9	7.0	9.5

Source: DGQA

## Vendor base

The Defence Procurement Manual, 2009 (DPM 2009)<sup>[14]</sup>, which covers all revenue procurement and procedures for the registration of firms, follows the Joint Services Guide: 015:13:03:2007 (JSG-015). This guide provides the methodology of assessment and registration of vendors as well as their performance appraisal on technical and financial aspects and classification. Vendors registered with one department of the MoD can be considered for procurement by other departments of the ministry.

### Shortcomings in the process

Despite a common format, the procurement agencies such as DGOF, DPSU, DRDO and DGOS etc., follow their own vendor-registration process. There is no single source database available. Even within organizations, some SMEs are registered with more than one agency. It is estimated that there are more than 6,000 vendors, of which around 95% of vendors being from the SME sector.





**Exhibit 19: Defence vendor base**

Production/ procurement organization	Estimated vendors	Nature of procurement	Remarks
DGOF	2,000	Input material/ components/ subsystems	1. No authenticated single source data base available 2. Some SMEs registered with more than one agencies, even within organizations 3. Almost 95% of vendors are SMEs
DPSU	1,800	Input material, components/ sub-assemblies	
DGQA/ Service HQ procurement of parts/ sub systems by Material Org at Services HQ	2,500	Spare part/ replacement items	
DRDO	400	Sub-system development	
<b>Total</b>	<b>6,700</b>		

Source: Compiled from various sources

## Self-sufficiency and indigenous capability

### Design and production capability

The defence equipment of the services is in a variety of designs and concepts. A heterogeneous inventory creates known operational and logistic problems. As on date, most of the weapons, armored vehicles, ammunition and other defence equipment are based on technologies obtained from the erstwhile Soviet Union, East European countries and NATO countries.

An analysis of the design spread of the important items of arms and ammunition currently with the Indian Army, as detailed in Exhibit 20, proves that there is an issue at hand. Although this analysis is more than 20 years old, the situation has not improved despite the efforts of the DRDO and defence production. The former President of India, Dr. A.P.J. Abdul Kalam, in his book, *India 2020 – a Vision for the New Millennium*,<sup>[11]</sup> mentions that indigenous production of defence supplies in the country is only 30%; he recommends that it should move up to around 70% in the long term.

**Exhibit 20: Design spread of armament product**

Products	% based on number of items	% based on total value of production
Based on indigenous designs	12.7	13.9
Based on foreign designs but modified by DRDOs/OFs to suit Indian conditions	24.6	6.9
Based on foreign designs or produced under license agreement	62.7	79.2

Source: Rajyadhaksha Committee Report<sup>[10]</sup>

The regime of protection, licensing and state control of scarce resources has its own inherent disadvantages. It results in a situation of self reliance marked by inadequate infrastructure and technology, industrial legislation, inappropriate scales and economic controls resulting in dependence on other countries. India is the second-largest importer of defence hardware in the world, despite the fact that it has a massive public sector defence production base, comprising eight DPSUs, 39 ordnance factories and 50 R&D laboratories<sup>[12]</sup>. This is a cause for concern. Self-reliance through indigenization has been the underlying principle of the investment of over 6% of the defence budget for DRDO/defence production. Delays in some important DRDO projects, such as the Integrated Guided Missile Development Project (first conceived in 1983), the Light Combat Aircraft Project (1983), the Advanced Light Helicopter Project, the Arjun Tank Project (1974) and a number of smaller projects such as the Pinaka, a Multiple Barrel Rocket Launcher (MBRL), are well known and have added to the problems and challenges. The Comptroller and Auditor General of India (CAG) has also commented on these delays in various reports over the years.

A major and immediate concern relating to India's armaments strategy is to address the bulk obsolescence of major weapons systems. During the next 10 to 15 years, the country needs to replace all its major systems and spend a large proportion of the defence budget on capital expenditure, which is expected to be done mainly on imports.

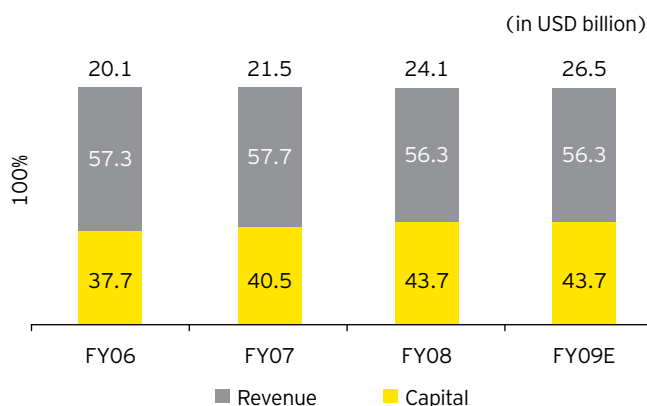
### Impact of indigenization

In its quest for self-reliance in the crucial defence sector, the Indian government has been continuing its efforts to indigenize the production of defence equipment wherever technologically feasible and economically viable. It originally planned to source 70% of its defence requirements from indigenous suppliers by 2010.

The armed forces have set in motion a strategy of enhancing their deterrence and operational capabilities by upgrading existing equipment in a planned and phased manner. It is imperative that perspective programs (Long Term Perspective Plan and the Five Year and Annual Plans) cater for upgrading of existing equipment and acquisitions. The Indian defence industry needs to cover the 15% shortfall between existing and desired levels of state-of-the-art-equipment. The process is expected to give a boost to India's defence industrial base.

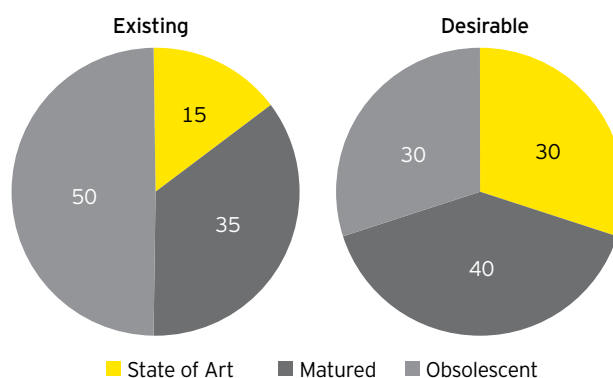
The cumulative defence budget (capital plus revenue expenditure) has grown at a CAGR of 9.65% during FY06-09 to USD26.5 billion for FY09, and is expected to be around USD40 billion by 2015. The capital budget will grow proportionally.

**Exhibit 21: Percentage share of revenue and capital expenditure, FY04-09E, in %**



Source: MoD<sup>(15)</sup>

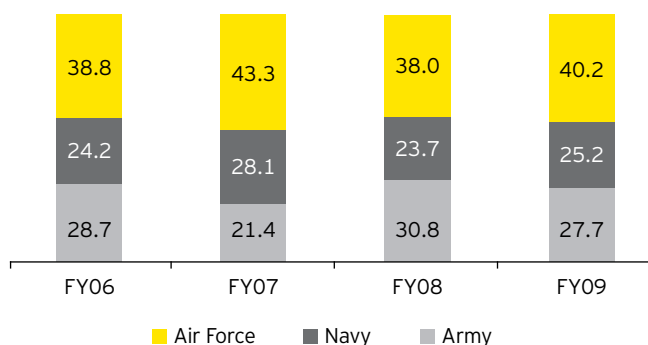
**Exhibit 22: Defence equipment, by technology, in %**



Source: MoD officials

Capital expenditure on the aerospace systems has been much higher than on naval and land systems during the recent past (Exhibit 23). This trend is likely to continue in case of planned acquisitions. It clearly brings out the fact that in the defence segment, it is the aerospace industry which will be the dominant force in the near future.

**Exhibit 23: Share of capital expenditure, in %**



Source: MoD<sup>(15)</sup>

In its report, the Vijay Kelkar Committee has projected the economic impact of reducing defence imports from the current 70%. A mere 25% reduction on foreign dependence on defence imports will save the foreign exchange outgo by INR85 billion, accelerate manufacturing GDP growth by 8% and create 120,000 new jobs.

#### Exhibit 24: Impact of import reduction

% reduction on foreign dependence	Incremental increase p.a. (INR billion)	Acceleration in manufacturing GDP growth rate	Additional jobs
25%	85	8%	120,000
50%	111	11%	150,000
75%	142	14%	200,000

Source: RBI data from Dr Kelkar Committee Report<sup>(18)</sup>

#### MoD's initiative on government-industry partnership

The government's decision to keep defence production virtually under its jurisdiction is partly due to the inadequate capabilities of the private sector and the critical and sensitive nature of the defence industry.

The private sector has played a significant role in the defence industry as sub-contractors and in the ancillary industry, although, until recently, its participation was largely restricted to supplying raw materials, semi-finished products, and parts and components. After a meeting between the Defence Minister and CII in 1998, six joint task forces were formed comprising industry and the Department of Defence Production and Supplies, to expand government-industry partnership. Their recommendations included:

- ▶ Reviewing the existing partnership between the MoD, industry and military
- ▶ Evolving strategies for long-term partnerships between these groups
- ▶ Studying the existing capacity of the DGOF and DPSUs
- ▶ Exploring the possibility of joint ventures
- ▶ Developing joint marketing arms for exports
- ▶ Leveraging India's strengths in information technology in the defence sector

Based on CII recommendations, MoD announced the opening of the defence production to the private sector in year 2001. It also constituted the Dr Vijay Kelkar Committee to review the DPP to integrate users, MoD and the industry.

#### Opening up the defence sector

With the opening of defence sector, 100% equity participation in defence production was allowed to the private sector with foreign direct investment (FDI) permissible up to 26%, both being subject to licensing

restrictions. Following the policy change, all defence-related items have been removed from the government's reserved category and transferred to the licensed category. As a result of this, the private sector can now manufacture all types of defence equipment after obtaining a government license.

However, as per the Standing Committee on Defence (2005-06)<sup>(13)</sup> on Procurement Policy and Procedure, the private sector participation in defence industry continued to be minimal. Some of the constraints faced by private industries are as under:

- ▶ **Policy issues:** The DAC categorizes a request for proposal (RFP) as "Buy," "Buy and Make" or "Make," based on the advice given by DRDO and the public sector. No inputs were sought from the private sector. In all the deals, where transfer of technology was negotiated, the nominated recipient was always a DPSU, even if a private sector company was better placed in terms of infrastructure and know-how to absorb the technology.
- ▶ **Procedural issues:** The requirements of the armed forces were not made known to the private sector sufficiently in advance. The private sector did not get adequate time, either to scout for foreign tie-ups or to set up the necessary facilities.
- ▶ **Scale issues:** Every producer seeks economies of scale and needs to be assured of continuous orders. Unfortunately, the RFPs were issued for one-time piecemeal quantities without indicating the envisaged total requirement over a period of time. Additionally, no long-term commitment was made relating to a regular flow of orders. This deterred companies from committing their resources to set production facilities since the venture could prove to be expensive as well as risky.
- ▶ **Lack of communication and mutual confidence:** Lack of trust and an effective institutionalized interface between the MoD, the services and the private sector in the defence industry created an uncertain environment with regard to policy implementation and negatively affected the participation of industry.

## Scope for the SME sector

The defence industry needs the SME sector to strengthen national capabilities from a long-term view. They can be involved in several areas such as:

- ▶ Aerospace: sub systems and accessories, ground equipment and tooling
- ▶ Naval systems, subsystems and accessories
- ▶ Land systems, subsystems and accessories
- ▶ Capital goods
- ▶ IT hardware and electronics
- ▶ MRO
- ▶ Casting, forging and metal works
- ▶ R&D
- ▶ Software

The areas mentioned above not only have a strategic importance but also have technological importance. The MoD requires high technology components and sub-assemblies in these areas. The private sector in the country has proved its edge in these sectors and believes it has the capabilities required for defence production.

## Concerns

In India, SMEs working for the defence sector are generally dependent on DGOF, DPSUs and DRDO etc. Ordnance factories outsource around 40% of their production in the form of components and sub-assembly requirements, mainly from SMEs. The SME segment, with limited business support and research base, is not always competent to meet the current requirements. Moreover, as production targets vary on an annual basis, sourcing of components/sub-assemblies from SMEs is not a constant and sustained activity.

**Technological base:** Technology expertise is the most critical challenge faced by most Indian companies. India needs to keep pace with the increasingly high use of technology across the design lifecycle. Foreign companies are reluctant to transfer cutting-edge technologies with limited management control in the Indian entity, and in the past, have given licenses for older technologies. Most defence systems are based on foreign design and the complete technology is not available with the production agency. Hence, SMEs are often unable to gain access and guidance on the desired technology. They also lack awareness of

intellectual property rights and legal issues.

**Payment terms:** SMEs have a small capital base and generally require immediate cash payment. They cannot withstand payment delays, which are inherent in government accounting and audit procedures and do not like to deal with the Controller of Defence Accounts. Therefore, many SMEs that have an established technological base are reluctant to enter the defence market.

**Security requirements:** Defence products are lethal in nature and generally all the components/sub assemblies require careful accounting. Even rejected components may be lethal if in the wrong hands. OEMs require SMEs to put in place detailed accounting procedures and security systems which add to costs.

**Tight schedules:** The DGOF and DPSUs face problems due to lack of advance planning and forecasts by the defence forces. Production has to work on tight delivery schedules, which makes life even more difficult for SMEs that supply material to them.

**Competitive pricing:** The DGOF and DPSUs are no longer protected entities and are subject to competition from imports. This puts a price pressure on SMEs, who, due to their limited size, are unable to meet economies of scale. They therefore tend to compromise on quality to cut costs.

**Certification process:** Getting certifications for processes and parts is a challenge for India-based suppliers. It is also a deterrent for OEMs to outsource some of their components to India, since approval for parts made in India can sometimes take too long and become cost inefficient.

There are accreditations and certifications in place for special processes and product quality standards. However, Indian companies need enhanced support from the government through bilateral arrangements with international certification agencies.

**Quality issues:** Quality assurance and reliability are essential in aerospace and defence technologies due to the stringent requirements of weight-to-strength considerations and the need for highly reliable systems. The industry works on a zero defect target. While quality control in Indian manufacturing has improved significantly, a mature supplier base is still being developed in the country and the inability of SME suppliers to keep abreast with rising quality issues could become a problem for Indian aerospace and defence companies.



**Competition:** Ordnance factories are forced to issue limited or open tenders on components and sub-assemblies to meet government-mandated procurement procedures, even when the quantity of items required is small. These procedures tend to drive up the cost of procurement for small quantities and also result in delays. The cash purchase and single tender financial powers available to the managers of factories lose their value since managements are reluctant to exercise these powers to avoid accusations of corruption and favoritism. On the other hand, the limited number of and formation of clusters of SMEs, who are established suppliers of specific components required by OEMs, frequently affect their competence vis-a-vis private players.

**Security of supply chain:** Security of supply in defence means the capacity to ensure the preparedness of the armed forces to respond to security threats. Further, the availability of maintenance and repair capability, spare parts, material and other support to keep critical systems functioning in all conditions, using domestic and foreign resources, is also important. SMEs and their clusters are important elements which are needed to secure supply for the present and the future. SMEs provide advantages in terms of innovation, enterprise and responsiveness, but these qualities also give them the flexibility to easily shift to different markets. This is especially the case where SMEs and clusters of SMEs are working in a framework dominated by large prime contractors at different tiers of the supply chain. In such a situation, there is a need for the government to lay down policies which will ensure the security of a supply chain in peace time, as well as during periods of heightened tension and war.

## Conclusion

The current geopolitical situation is volatile. We have challenges from both within the country and outside. India is becoming a significant player on the global stage and now attracts worldwide attention. In view of these and many other considerations, it is imperative that we build our indigenous capability by manufacturing and maintaining our defence equipment in the country. Being “defence prepared” will not only give us a strategic and economic edge but is also in the interest of national security.

It is time to seriously involve the private sector including SMEs, with its world-class expertise and high technology. The industry, irrespective of size, has shown a definite inclination to assume the role of system and sub-system integrators by investing in R&D and infrastructure to develop capabilities in defence production.

### Key findings

- ▶ There is a need to create a comprehensive vendor database indicating the capabilities of all SMEs and other companies active in the aerospace and defence sector for the benefit of OEMs and prime contractors.
- ▶ The increasing role of SMEs in the emerging aerospace and defence environment will augment India's indigenous defence production substantially.
- ▶ Indigenization of defence manufacturing will bring significant benefits in the form of reduced foreign exchange outflow, accelerated GDP growth and creation of new high value added jobs.
- ▶ Indigenization could be achieved through long term public-private partnership in defence R&D, product design and development, and marketing by leveraging India's strengths in information technology and manufacturing
- ▶ For SMEs to integrate in the aerospace and defence supply chain, they need to focus to achieve the stringent benchmarks related to cost, quality and delivery.



### 3

## Procurement policy implications and impact on SME participation

## Defence Procurement Procedure (DPP)

Procurement procedure is an integral part of the policies set up by the MoD. In 1992, the MoD laid down guidelines for procurement involving an outlay of more than INR 100 million. The guidelines, which followed a step-by-step methodology for the complete procurement process, were referred to as the DPP 1992.

Post Kargil conflict, the Group of Ministers on National Security recommended that the existing structure for procurement, which had resulted in the sub-optimal utilization of funds, was causing long delays in acquisition and was not conducive to the modernization of the services. They suggested the creation of a separate and dedicated institutional structure and the establishment of a Defence Procurement Organization. The DPP 2002 came into effect from 30 December 2002 and was applicable for procurements flowing out of the “Buy” decision of the Defence Acquisition Council (DAC). This procedure was subsequently amended in June 2003 to include procurement on “Buy and Make” through Imported transfer of technology (ToT). The current procedure, effective as of 1 November 2009, has been named DPP 2009.

The government set up a committee headed by Dr. Vijay Kelkar<sup>[18]</sup> in 2005 to examine and recommend changes in the acquisition procedures of the MoD. It studied ways and means of enabling greater participation of the private sector in defence production with the objective of strengthening self-reliance in defence capability. The Kelkar Committee, after various deliberations, submitted a report to the government in 2005. The thrust of the report was to strengthen self-reliance in defence preparedness, taking into account the increased capabilities of the Indian industry and the growing globalization of the defence industry.

### The focus was two-fold:

- ▶ Exploring synergies in the private sector, DPSUs, the DGOF and DRDO to promote high technology capabilities.
- ▶ Creating an environment that would facilitate growth in the export of defence equipment and services.

However, the implementation process is still lagging behind, even eight years after private sector entry was permitted, and four years since the acceptance of the Kelkar Committee recommendations. Some of the provisions in DPP 2008 and committee recommendations relating to private sector participation and their acceptance or refusal and implementations are interdependent.

## Defence production – reforms

The Kelkar Committee<sup>[18]</sup> recommended acquisition policy reforms with a long-term approach to encourage capability-based entry to promote innovation, efficiency and cost reduction. Suggestions focused on:

- ▶ Encouragement to successful private sector companies to participate in defence capability building
- ▶ Deployment of offsets as a vehicle to bring in technology and investment
- ▶ Creation of synergies between the private and government sectors to promote high technology capabilities
- ▶ Ramping up export of defence equipment and services

The impact analysis of the recommendations of the Kelkar Committee conducted by a Parliament Committee concluded that the implementation of the measures outlined would result in a high degree of indigenous production and defence preparedness. This would result in substantial economic benefits through increased growth in the manufacturing GDP, greater employment opportunities and substantial savings. There would be greater self-reliance in defence production, benefits in terms of R&D, technology spinoffs, higher industrial growth and exports, increased competition and more employment opportunities as well as cost savings.

### Recommendations yet to be implemented

Some of the major recommendations of the Kelkar Committee, which have supposedly been accepted, but have not been implemented on the ground, include:

- ▶ Preparation of a 15-year long-term plan forming the basis for the acquisition program
- ▶ Information sharing on the requirements of the armed forces with the Industry
- ▶ Identification of entry points for the private sector in the acquisition process
- ▶ Accreditation and fostering of Raksha Udyog Ratna (RUR/Champions) - once accredited, RURs/Champions should be treated at par with DPSUs
- ▶ Policy framework to promote participation of SMEs in defence production
- ▶ New institutional architecture for defence acquisition to set up a professional agency for it
- ▶ Defence R&D opportunities with DRDO and industry
- ▶ Promotion of transparency in decision-making

- ▶ Optimum utilization of existing capacity
- ▶ Re-examination of the concept of negative list of defence exports and setting up of export marketing organization

Detailed comments on the progress of implementation of these recommendations are provided in Appendix A.

### **Public-private partnership in defence – the reasons for its slow progress**

PPPs across various sectors have actually managed successful turnarounds, but the situation in the defence sector is quite different. Various regulatory and industry initiatives that were supposed to augment India's indigenous defence production capability through private sector participation have not yielded the desired results.

The government has not been able to leverage the in-built advantages of the private sector, including setting up of a reservoir of management, scientific and technological skills and self-reliance, to raise resources. Further, there is no clear demarcation of the role between DPSUs/ the OFBs and the private sector. Other concerns of private sector at the time of participation in defence are discussed below:

- ▶ Huge investments and capacities in DPSUs and the OFB resulting in their fear of being progressively edged out in a competitive race
- ▶ The concern that the private sector may not respond to national requirements in times of crisis in the same manner as a government-owned unit would.
- ▶ Doubts about the design capability of the Indian industry and absorption of technology in it: It is an acknowledged fact that the potential of the Indian private sector, especially in the areas of manufacturing, IT, electronics and software, is world class. There are hardly any systems that cannot be manufactured by the private sector. Imported embedded technology in the systems present a greater risk than the indigenous private sector. Further, critical information can be unknowingly shared with the country from which equipment has been imported.

Around the world, countries are seeking the participation of the private sector in the defence industry with a view to exploit its capabilities and focus on its strategic R&D. Getting the private sector involved will prove to be cost-effective, increase indigenization, help to generate

employment and shall benefit, both government and private players by combining their expertise. Finances thus saved can be made available to the government for re-investment in other areas.

Thus, it is necessary that the defence industry ramp up its manufacturing and maintenance capabilities by leveraging public-private partnerships. Further, the industry has shown a keen interest in the opportunities on offer and many large industrial houses have shown an inclination to assume the role of system integrators by investing in R&D and infrastructure and develop capabilities in defence production. There are around 6,000 companies supplying around 20-25% of components and sub-assemblies to DPSUs. Leading industrial houses such as the Tata Group, the Mahindra Group, Kirloskar Brothers, Larsen & Toubro and other companies have built up their defence equipment capabilities to meet domestic defence requirements.

Various partnerships and collaborations across the industry have tried to engage in defence production. Since 2002, the sector has seen filing of more than 100 letters of intent/ industrial licenses to design, develop and manufacture warships, submarines, electronic warfare systems and combat vehicles. Additionally, many companies have forged partnerships with global majors to provide high-end manufacturing and technology solutions. Interestingly, most Fortune 500 companies have set up design centers which provide designs produced indigenously. However, the private industry has not been able to contribute to its potential in the absence of a level playing field.

### **Raksha Udyog Ratnas (RURs)**

In 2006, guidelines for the selection of RURs were notified by the DDP, to identify frontline industries that would assume the role of system integrators of large weapon systems and producers of platforms required by the armed forces. The Kelkar committee submitted its report to the government in June 2007, recommending accreditation and fostering of RURs/ champion.

The RUR concept is a logical step toward reforms in India's defence industrial sector. The companies have the capability to "go global," despite scepticism on their mastery of complex military technologies. Given their potential, RURs, with their vendor base in the SME sector, could be the prologue to India's quest for self-reliance in defence. Recognition of RURs and facilitation, at par with government defence production units, will encourage them to assume



the desired role in the defence industry.

However, DPP 2009 proposes to include Indian defence vendors who are assessed to have requisite technical and financial capabilities as eligible to be issued with RFPs for “Buy & Make (Indian)” category.

### Project categorization and nomination

DPP 2008 covers all capital acquisitions (except medical equipment) undertaken by the MoD, defence services and the Indian Coast Guard from indigenous sources and by import. DRDOs, OFBs, DPSUs continue to follow their own procedures for procurement. These procedures divide all capital acquisitions into four categories as under:

#### 1. Buy category

This entails the outright purchase of equipment from a foreign or Indian vendor. Based on the source of procurement, this category would be classified as “Buy Indian” or “Buy Global.” Buy Indian refers to procurement from Indian vendors with a minimum of 30% indigenous content, while Buy Global refers to procurement from both international and Indian vendors. The recent RFP for “buy” is for 155mm/52 caliber Ultra-Light Howitzer guns <sup>[21]</sup>.

#### 2. Buy and make category

This entails buying a portion of a system from a global vendor, followed by licensed production/ indigenous manufacture within the country, and is the preferred route for most large quantity high-value contracts<sup>[22]</sup>.

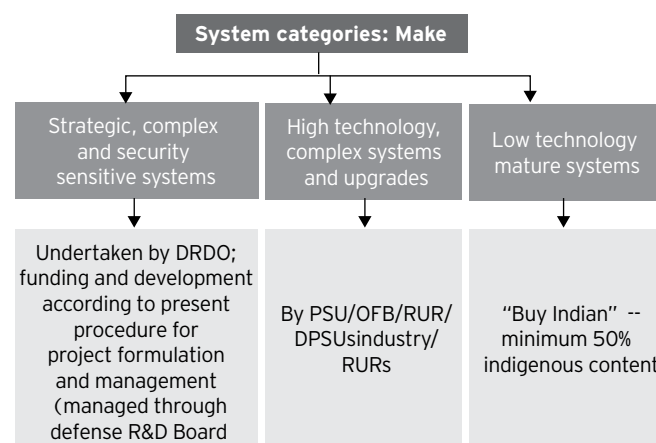
In this category, the DDP nominates an agency to procure technology for indigenous production. It has been the practice to nominate an agency from the government sector and the agency negotiates aspects relating to ToT. The past record of technology absorption by the public sector through such arrangements has not been satisfactory. The OEM provides elementary drawings of sub-assemblies, components and assembled equipment. Indigenous production has not benefited from designs, technological know-how and upgrades from such an arrangement, thereby perpetuating dependence on them.

#### 3. Make category

This category includes high technology complex systems, designed, developed and produced indigenously. This category applies to defence products that are designed and made by Indian companies. The government and the private sector can compete for the project in their area of

competency. Two production agencies are selected for the development of the item. The shared development cost, up to 80%, is borne by the government. An integrated Project Management Team (IPMT) supervises and monitors activities throughout the process. This is the framework for increased participation of Indian industry in the defence sector. The “Make” category is further divided into three sub-categories.

**Exhibit 25: Make system categories**



Source: DPP 2008

The categorization above and the basic process of categorization and implementation are among the major issues relating to the entry of the private sector into defence production.

### Nomination by the MoD for “Buy and Make” and “Make” categories

The existing provision in DPP allows the MoD to nominate government sector defence production units for projects under “Buy and Make” and “Make” categories. The Defence Production Board (DPB), responsible for the nomination, has representation from the DPSU and the OFB, but not from the private sector. In the recent past, cases that would have come under “Buy and Make,” with 70-80% foreign content, were classified as “Make” and awarded to DPSUs. Two cases in point, in this regard, are as under:

- Indian industry has been left out, even in communication programs, in spite of a successful track record in the telecom and IT sectors. The programs continue to be categorized as “Strategic Make” direct or through DRDO, although the import content is 70-80%.



- Building contracts for warships is given on a nomination basis to shipyards. Private sector shipyards have the capacity, capability and requisite license to execute this complex work. However, for more than five years, no warship construction contract has been awarded to them.

Thus, to provide a level playing field to the private sector, there is a need to move away from the process of nomination.

#### **Promote Progress in “Make” Category**

The MoD should promote more programs in the “Make” category to give a boost to the private defence sector. This will also promote the formation of JVs between the Indian defence industry and foreign defence majors, which could become a driver for growth for the defence industry. Interestingly, not a single “Make” category RFP has been floated by the MoD since DPP 2006 became operational. While reviewing the performance on indigenization of defence production through public-private partnership, the Standing Committee on Defence of The Fourteenth Lok Sabha 2008-2009 observed<sup>[23]</sup>: “Considering the fact that the ‘Make’ category incorporated in the Defence Procurement Procedure way back in 2006 has not yielded any tangible results despite the private industries in the country having registered a significant growth in indigenous capabilities in development and manufacture in the defence sector, the Committee feels that there is an urgent need to fine tune and rationalize the procurement procedures under ‘Make’ category so as to achieve the goal of self- reliance in real sense.”

Thus, the MoD needs to give equal opportunities to the Indian private sector, to participate in the design, development and manufacture of defence equipment. The DDP, which presently looks after DPSUs, should also be responsible for the private sector units engaged in defence production.

According to DPP 2008, the armed forces must directly participate as a part of the project team and advise the industry on “Make” category projects. The provision, which allows 80:20 fund-sharing between the government and industry, needs to be made operational.

#### **4. Buy and Make (Indian)**

DPP 2009 has introduced a new category - “Buy and Make (Indian)”. In cases categorized as “Buy and Make (Indian)”, RFP will be issued to only Indian vendors, who are assessed to have requisite technical and financial

capabilities to undertake such projects. Purchase from an Indian vendor would include an Indian company forming joint venture / establishing production arrangement with OEM followed by licensed production / indigenous manufacture in the country. “Buy and Make (Indian)” must have minimum 50% indigenous content on cost basis.

For selection of such cases, SHQ will prepare a Capability Definition Document which outlines the requirement in operational terms and briefly describes the present capabilities determined on the basis of existing equipment, manpower etc. The document should also indicate long term requirement in terms of numbers, time schedule, immediate fund availability and the critical technologies to be absorbed by Indian partner. The critical technologies will be identified in consultation with DRDO.

DAC will decide selection of a project under Buy and Make (Indian) on the recommendation of the SCAPCHC. These Indian firms will be short-listed on the basis of the responses to RFI and through interaction with representatives of Industry Association by SHQ through HQ IDS.

The Indian firms would be required to give a Detailed Project Proposal which will outline the roadmap for development and production of the item either by themselves or with the help of any production arrangement with foreign manufacturer. The Detailed Project Proposal will be appraised by a Project Appraisal Committee (PAC) constituted by the Acquisition Wing.

DPB along with a multi-disciplinary Project Monitoring Team (PMT) will monitor the implementation of projects taken up under this category.

#### **Sharing of long-term plan and mapping industrial capability**

It is important to share the future needs of Armed Forces with the industry. There is a need for the armed forces to bring out a perspective document which outlines the technology perspective and capability road map covering a period of at least 15 years. According to DPP 2009, HQ IDS will bring out a public version of perspective document outlining the technology perspective and capability road map covering a period of 15 years - Long Term Integrated Perspective Plan (LTIPP). This document will be widely publicized and made available on MoD website. Other plans under DPP 2009 include a medium term Five Year Defence Plan which covers the requirements of the Services Capital Acquisition Plan (SCAP) taking into account operational



exigencies and the overall quantum of funds available, and an Annual Acquisition Plan (AAP) which is a subset of the SCAP.

LTIPP would help prospective vendors to identify areas of interest and initiate necessary action well in advance, as detailed economic viability studies are essential for all investment decisions. There is a need for a strategy to develop the defence industry, based on identification of technologies and capabilities that require special attention, e.g., aviation, communications, electronics, sensors, etc. Since scouting for technology partners and establishment of required infrastructure are time-consuming activities, it is imperative that the requisite information is disseminated well in advance to enable companies to do the preparatory work and be ready to participate in tenders when they are issued.

Further, the Services Capital Acquisition Plan Categorization Higher Committee (SCAPCHC) does not have industry representation to provide an insight into industrial capability in the private sector. Under DPP 2009, where the Categorization Committee feels that participation by Indian industry is probable, it will invite representative of industry associations to give presentations and clarifications, as required by the Categorization Committee. The representatives would however not be present in the internal discussions and during the decision making stage of the Categorization Committee meeting.

The inclusion of industry representatives under Acceptance of Necessity procedures under DPP 2009 is a welcome step as it would help in mapping industrial capability.

#### **Level playing field**

Government undertakings in the defence sector continue to be preferred over the private sector, despite numerous policy initiatives to harness and augment private sector capabilities. We need to replicate and imbibe the learning here, especially from the markets of the West. The MoD needs to create an environment that facilitates indigenous production, leveraging indigenous capabilities, and strong governance that fills the gap between rhetoric and reality. The private sector should be empowered to have access to the same resources availed by the DPSUs and OFB, and needs to be involved in product development strategy as well.

The challenges that hamper the private sector from gaining a share of the pie:

**Purchase preference:** The government gives purchase preferences to DPSUs for tenders exceeding INR50 million if the price quoted is within 10% of the lowest bid.

**Discrepancy in tax structure:** DPSUs enjoy the benefit of customs and excise duty exemption and so do tier-II vendors. This advantage is not available to the private sector while competing with DPSUs.

**Difference in payment terms:** There are different payment terms for DPSUs and the private sector. Progressive payments may be considered for long-term projects of high value. Indian vendors should also be permitted to pay through a letter of credit.

**Varied risk coverage:** There should be parity between DPSUs and RURs on risk coverage and progressive payments. Corporate bonds against bank guarantees from corporate organizations and foreign exchange rate variation (FERV) is permitted for DPSUs, but is not clearly specified for the private sector and FERV risk coverage is a must for it.

**FDI:** While FDI limit of 26% in defence may be increased where a DPSU is involved, the norms are not as flexible in case investment is sought in collaboration with private sector players.

**Bid process:** The evaluation procedure for bids needs to be reviewed. In the case of complex projects that require a high level of technical competence, bids should be evaluated for technical capability and price. Criteria for weightage of price and technology should be decided on technical complexity and declared with the RFP.

**Taxation:** A level playing field on taxes and duties, with respect to DPSUs, was granted under DPP 2006 for the "Buy" (global) category. This has not been extended for "Buy Indian," "Buy and Make" and "Make" category projects.

**Taxes and duties loading for L1 evaluation:** While competing with a foreign OEM in the Global Buy category, terminal taxes and duties such as VAT are kept out of the Indian bid, and Excise Duty Exemption is granted for most system orders. A mechanism needs to be put in place to either exempt both foreign and Indian vendors or levy customs duty, CVD, Octroi and VAT/CST on both.

While reviewing the performance of “Indigenization of Defence Production Public-Private Partnership, the standing committee observed <sup>[23]</sup>: “Committee has been given to understand that there are several areas where distinction is made between the private and public sector while procuring defence equipment. These are inter-alia:

- 1) Nomination for transfer of technology where the foreign suppliers are specifically asked to collaborate with a DPSU
- 2) Discrepancy in tax structure for exemption of customs and central excise duties as well as foreign exchange rate variation
- 3) Non-acceptance of corporate bonds as collateral etc

The Committee considers that these issues need urgent attention with a view to doing away with discriminatory treatment so that the necessary thrust is provided to the private sector striving hard to augment indigenous defence production in the country. The Committee is of a strong view that a level playing field and equal opportunities would not only promote healthy competition between the public and private sector but would also result in cost effectiveness of indigenously produced defence equipment.”

#### **RFIs and RFPs**

At the proposal stage, the first step is forecasting system requirements. The MoD anticipates new programs and shares it with the industry at an early stage. Service headquarters seeks information on products or systems from prospective bidders in “Buy” and “Buy and Make” cases and issues RFPs.

Currently, some organizations have begun providing information about RFI/ RFP on their websites, while some are yet to make a beginning. Advance information on defence acquisition through a common platform, the MoD website or industry bodies such as CII, will be a welcome step. This will enable industry to plan and provide the lead time and opportunity to assess and seek foreign collaborations.

Additionally, there is a need to lay down norms on the issue of RFPs. The prequalification of a company in terms of its technical and financial capability should be a criteria for RFP/RFI. Capability mapping is essential for large defence projects where the ability to execute in terms of technology, finance and maintenance support throughout the life of the project is crucial. In the event RFIs/RFPs are issued to a large set of companies, including small companies with no

track record, foreign technology can be imported through the back door. RFPs must define unambiguous details including the number and type of equipment sought.

#### **Indian defence offset provisions**

Indian defence industry is likely to benefit from offset provisions. Offsets are applicable to all procurement proposals where the indicative cost of procurement is above INR3 billion and the schemes are categorized as “Buy Global” and “Buy and Make” with transfer of technology. Discharging offset obligations is achieved through the following ways:

- ▶ The direct purchase or execution of export orders for defence products and components manufactured, or services provided, by Indian defence industries, i.e., DPSUs, OFB and any private defence industry player manufacturing these products or components under an industrial licence granted for such manufacture. For the purpose of defence offset, “services” refer to maintenance, overhaul, upgrades, life extension, engineering, design, testing and defence-related software or quality assurance services.
- ▶ This includes FDI in the Indian defence industry for industrial infrastructure for services, co-development, joint ventures and co-production of defence products.
- ▶ It also includes FDI in Indian organizations engaged in defence R&D as certified by the Defence Offset Facilitation Agency.

Offsets should be directed to promote self-reliance and indigenous capability involving advanced technologies. To attract foreign investment and enhance domestic industrial capability, the offset policy needs to be suitably modified by a favorable atmosphere including a realistic banking period, offset trading, licensing policies and other innovative provisions. Several countries have and continue to successfully enforce such offset clauses in the interests of their economies to enhance their knowledge base and industrial capabilities.

#### **SMEs gaining through offset and product strategy**

Largely, OEMs do not make defence systems by themselves; they are integrators. In 90% of the cases, subsystems are made by SMEs. They are likely to benefit through the offset or the involvement of local tier-I integrators. OEMs often discharge their offset obligations by purchasing a



wide range of components and materials from the client's country. SMEs can participate successfully in offset programs, since the offset applies to the contract value and not the size of the company.

In this regard, the Kelkar Committee has made a significant recommendation that "components and parts of acquired equipment" are to be made in India. With such indigenous production, the armed forces will gain through improved life cycle support through local maintenance and upgrades and maturing of the Indian defence industry.

#### **Defence Offset Facilitation Agency (DOFA)**

DOFA, under the DPP, was established to facilitate:

- ▶ Implementation of offset policy
- ▶ Evaluation of offset proposals
- ▶ Assistance to vendors to interface with industry to identify potential offset products or projects
- ▶ Keeping an account of the progress of offset contracts
- ▶ Keeping track of offset banking
- ▶ Provision of policy clarification and refinement
- ▶ Assist in monitoring the offset provisions

In terms of organizational structure, DOFA is headed by the Joint Secretary (Export), with the Directorate Planning and co-ordination in DDP providing secretarial assistance. There are some weaknesses in the current institutional framework as DOFA handles work related to defence acquisition and seeks guidance on them but reports to the DDP. Another dichotomy, which presently exists, is that the Joint Secretary (Exports) does not report to the Special Secretary Acquisition Wing, thereby creating a situation which results in lack of synergy. Notwithstanding this, in its present form, it lacks the necessary strength in terms of requisite people to handle the massive workload that is expected to be generated due to offsets. The MoD is reportedly considering expansion of DOFA<sup>[19]</sup>.

In order to carry out the function in its true sense for which it has been created, the expanded organization should ideally have:

- ▶ A technology evaluation cell
- ▶ A legal cell dealing with the law relating to commerce and foreign trade
- ▶ An accounting capability cell to keep track of offset liabilities
- ▶ SME facilitation cell

Autonomy should be accorded to the DOFA with substantial representation from the industry. For smooth implementation of the offset policy, an enlarged, empowered DOFA, with greater clarity about its role, is required.

#### **Licensing requirements**

In 2002, the Department of Industrial Policy & Promotion (DIPP), in consultation with the MoD, issued guidelines (available at [www.dipp.nic.in](http://www.dipp.nic.in)) for licensing the production of defence products. The list of defence products incorporated in DPP-2008 is geared for compliance with International Traffic in Arms Regulations (ITAR) for international transfer of military and dual-use goods, and as such, does not provide guidance on industrial licensing. An Indian company producing any of the products mentioned in DPP 2008 is eligible to become the offset partner of a foreign vendor. However, the Indian "offset partner shall, besides any other extant regulations in force, also comply with the guidelines/licensing requirements for the defence industry issued by the Department of Industrial Policy and Promotion."

The DPP list of defence products needs to be refined in line with the industrial licensing policy to avoid confusion. The offset facility is restricted to companies with industrial licenses, which is a pre-requisite for export contracts. Traditionally, a number of companies have been producing these items without any license; it is therefore doubtful whether such companies will benefit from the offset business. On the other hand, some sections of the industry feel that licensing norms should not be diluted for capability filtering and security reasons. Given the need to promote competition in industry, the existing licensing policy needs to be clarified. Further, the SMEs operating in the system domain should be encouraged to apply for licenses. The list of companies acquiring defence licenses can be regularly updated on DOFA and the CII website.

#### **Transfer of technology (ToT)**

Technology transfer and absorption are essential for India's long-term industrial needs. Currently, technology transfer is not considered to meet offset obligations. However, in the procurement policy, technology has been considered essential for upgrading, and this requirement is to be identified and included in the RFP. There are inherent difficulties in the valuation of technology and an apprehension that transferred technology will never be a part of the core technology.

Foreign vendors have been pressing to allow ToT to India as a part of offsets because the process of forming manufacturing partnerships with Indian defence producers can be avoided by discharging offset liabilities through ToT. However, foreign vendors are not comfortable with transferring proprietary technology to a company with barely 26% ownership.

The local industry needs to absorb and master technology to ensure the future operational autonomy of the Indian defence services. Indian companies with proven or potential capabilities need to be promoted and referred to OEM suppliers and partners. The export market can also be explored by leveraging synergies between OEMs and industry for joint R&D and technological support.

#### Foreign Direct Investment (FDI)

May 2001 was a landmark year for Indian defence sector. The Indian government decided to open up the defence industry for private sector participation up to 100% of equity, with FDI permissible up to 26%, subject to licensing restrictions. Global defence majors decided to exploit the potential offered, but were reluctant to collaborate in technology or mandatory offset arrangements in their own interests.

According to a Ministry of Commerce and DIPP April 2009 publication, FDI in sectors outside defence is strong despite the global economic downturn. From January to November 2008, FDI in Indian companies in 62 sectors grew by 90% to USD16.5 million from USD8.7 million during the same period a year ago. The domestic defence sector witnessed the lowest FDI of INR6.9 million (USD133,000).

A lower FDI flow to defence sector could be attributed to uncertainty among global defence OEMs in terms of sustained orders and commercial risk mitigation. International experience has shown that with higher stakes, OEMs will be keen to transfer technology and enter joint ventures for their long-term gains. Thus, India could consider adopting a flexible FDI policy on a case to case basis in the defence sector to enable foreign partnerships to be more effective.

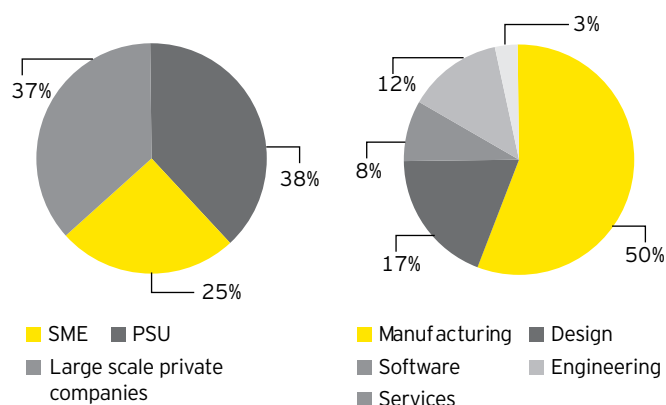
While reviewing the performance of indigenization of Defence Production through PPP, the Standing Committee

on Defence, Fourteenth Lok Sabha 2008-2009 observed<sup>[23]</sup>: “While giving due weightage to the numerous benefits that would accrue to the industry and economy as a result of increased inflow of FDI, the committee is of the view that the possibility in increasing limit of FDI up to 49 percent in defence sector should be examined by the Government after keeping in view the fact that national interest must reign supreme in defence related matters”.

#### Offset market opportunities for SMEs

India is expected to spend close to INR4,000 billion (USD100 billion) on defence procurements during the period of implementation of the 11th Plan (2007-2012). Considering that imports account for 70% of the expenditure on defence procurements, offset obligations worth INR860 billion (USD21.4 billion) will be generated at 30% of the contract value. MoD, has confirmed that offset contract worth about INR 7,500 crores have been signed till July 2009 and the spread is by and large as per Exhibit 26.

**Exhibit 26: Spread of offset agreements by entity and activity**



Source: MoD

CII regularly organizes India Regional Offset Conference for the benefit of OEMs, prime contractors and SMEs. Additionally, there should be guidelines/ code of practice for the prime contractors to maximise the participation of SMEs in offset contracts.

## Indigenization

As discussed in Chapter II, it is clear that despite huge investments in R&D, production and existing capacities in government defence industrial undertakings, the plan to source 70% of its defence requirements from indigenous suppliers by 2010 is far from reality.

India's capital acquisition requirements include aircraft and aerospace, heavy and medium armament systems, vehicles, platforms, naval vessels, amongst others. The indigenous systems are provided by defence public sector units and OFBs.

According to the details given to the Parliamentary Standing Committee on Defence, HAL has achieved 70-75% indigenous content and BEL has indigenization of over 60%. Indirectly, that means that even for such technology, we are depending on global OEMs to the extent of 40%. This continued dependence on foreign collaborators for updated designs, even after several years of the implementation of license agreements, indicates the ineffectiveness of indigenization initiatives.

## Facilitating indigenous development

As of now, procurement procedures operate according to strict stipulations, which make it particularly difficult for Indian companies to be part of the quotation and bid process. Some of the regulations not only make the stipulations seem stringent but appear to be biased. For example, an Indian bidder will only qualify if it had supplied products in the international market or has a foreign collaborator. This stipulation is perceived as an attempt to keep out Indian products.

The entire thought process of the DPP needs to change to encourage indigenous products offered by reputed organizations or backed by adequate technology support and tested to international standards. Procedures providing a purchase advantage to domestic manufacturers, as is the case in the US and France, will help to create the initial market for products and services developed through indigenous R&D in the country.

**Exhibit 27: Capital acquisition by service, in %, FY01-07**

Year	Navy		Army		Air Force		Total for the three services	
	Imported	Indigenous	Imported	Indigenous	Imported	Indigenous	Imported	Indigenous
FY01	36.0	64.0	46.0	54.0	81.0	19.0	54.3	45.7
FY02	48.9	51.1	34.0	66.0	74.0	26.0	52.3	47.7
FY03	50.4	49.6	65.0	35.0	70.0	30.0	61.8	38.2
FY04	57.7	42.3	52.0	48.0	76.0	24.0	61.9	38.1
FY05	57.8	42.2	42.0	58.0	62.0	38.0	53.9	46.1
FY06	33.9	66.1	30.2	69.8	26.3	73.7	30.2	69.9
FY07	34.1	65.9	23.4	76.6	10.8	89.2	22.8	77.2
FY08	23.5	76.5	42.7	57.3	41.9	58.1	36.0	64.0

Source: 6th Report of the Standing Committee on Defence, December 2005 and Thirty Third Report of Standing Committee on Defence-December 2008<sup>(17)</sup>

### **Multiplicity of registration procedures and vendor base<sup>[20]</sup>**

The issue of multiplicity of vendors and the registration procedure has been discussed in Chapter II.

All defence procurement agencies function independently. Tenders are not publicly published due to security considerations or are published in papers with limited reach and restricted publicity<sup>[20]</sup>.

To tackle these issues, a directory of credible defence manufacturers should be compiled with details of all the assessed companies. This directory should be made available to every defence procurement agency to facilitate identification of companies for issuance of tenders. The directory can also help foreign producers locate potential Indian partners for collaboration and offset fulfilment.

### **Industry participation in research and development**

Currently, SMEs and large private sector companies are keen to get engaged in defence R&D with DRDO. However, barring some exception such as PINAKA, almost all production opportunities have gone to OFB/DPSUs. Once there is parity, the private sector will become the recipient of defence technologies as a prime contractor. The DRDO needs to look at the time lag between design, development and product realization throughout the industry. Hence, there is a need to enter into an economic long-term partnership with industry. Companies that have invested in R&D will seek assurance of a long-term commitment for future orders. Without such assurances, industry will not invest in R&D. Major corporate organizations will get involved in defence R&D once such practices are in place.

Defence projects are typically investment-intensive with long-term engagements. The current policy of development at "No cost No Commitment" has made the industry reluctant to invest in defence R&D. There is a need to adopt the US approach of 100% financing in a partnership between industry, the DRDO and the armed forces. The requirements, scope of the project estimates, duration, etc., should be shared with industry. Industry will then discuss the assessment with the defence procurement committee, which will decide on which company will design and manufacture the products. Most importantly, the entire cost of design needs to be paid by the government.

While reviewing the performance on Indigenization of Defence Production Public-Private Partnership, the Standing Committee on Defence of the Fourteenth Lok Sabha 2008-2009, observed<sup>[23]</sup>, "Having recognized the potential of some

of the small and medium enterprises (SMEs) in the country, the Government has decided to formulate a scheme for providing financial assistance to these enterprises to take up design and development work in the defence production. The Committee urged the Ministry of Defence to take care that the scheme is finalized and implemented after due consultation with the agencies concerned so that the potential of these enterprises is utilized to its optimum level without any loss of time. The Committee also desires that some institutional arrangement in collaboration with DRDO and other research organization should be put in place to gainfully utilize the efforts of these enterprises in promoting indigenous defence production."

As recommended by the Kelkar Committee, a Defence Technology Product Development Fund could be immediately initiated to fund SMEs for carrying out design and development work.

### **Sample Survey and Interaction with CEOs from the SME sector**

A sample survey was conducted by CII and Ernst & Young to assess the perceptions and impact of offset-related issues such as the capability and impact of SMEs, offsets, R&D, defence procedures, FDI, ToT, JVs, RURs, the participation of the private sector in the defence industry and the problems experienced. The gist of the responses have been collated and provided in Appendix B.

The opinions of hands-on CEOs of SMEs engaged in defence production, who were well versed on the subject, were also solicited in an interactive session. The summary of the observations is in Appendix C.

The responses and suggestions received have been duly incorporated in the recommendations.

## Conclusion

The government opened up the defence sector to the private sector in 2001, during an era of growing self-reliance, by formulating defence procurement policies. These policies were designed to develop defence equipment capabilities through co-development and co-production with international manufacturers. It is imperative to have in place a policy framework that can be deployed seamlessly.

The private sector needs to be given parity, with the realization that both the public and the private sector are national assets. Fair competition will harness their potential to achieve the aim of self-reliance in defence production.

## Key findings

- ▶ Government may consider focusing only on areas of strategic importance and gradually integrate private sector into non strategic areas.
- ▶ Private sector to be closely involved in long term defence planning and project categorization to enable them to map their capabilities, plan their investments and supply chain accordingly.
- ▶ Process of identification and notification of RURs should be accelerated to enable SMEs to register themselves in the supply chains of RURs
- ▶ There should be a level playing field between private and public sector in terms of policy and procurement norms.
- ▶ To develop and monitor robust and effective offset programs, DOFA should be adequately empowered and provided with additional resources.
- ▶ Simplify licensing procedures to encourage entry of SMEs into the defence industry
- ▶ FDI norms could be made flexible where partnership with foreign OEMs is sought with private players in critical technologies and R&D programs
- ▶ Private sector participation in defence R&D should be actively encouraged and financed primarily by the government.
- ▶ Given that necessary policy framework for categories "Make" and recently introduced "Buy and Make (Indian)" have been put in place, it would be equally important to identify specific projects for these categories in a well-defined, coordinated and time bound mechanism.





# 4

## Private sector participation— international experiences

## Global defence industry

### Introduction

The defence industry is an important source of employment. It generates strong revenues and contributes substantially to governments' exchequers. In many industrialized countries, the defence industry is a cooperation of public and private partnerships, with governments being the largest investors and customers.

The world over, military expenditure is being driven by the global war on terrorism and there is an increased focus on the need to guard national borders. In this regard, following data from a research study by the Stockholm International Peace Research Institute (SIPRI) provides an insight into global military expenditure:

- ▶ In 2007, world military expenditure was estimated at USD1,339 billion which is 2.5% of GDP, a real-term increase of 6% since 2006.
- ▶ From 1998 to 2007, world military spending increased by 45% in real terms.
- ▶ According to market exchange rate terms and purchasing power parity, the five countries with the highest military expenditure in 2007 were the US, the UK, China, France and Japan.

### Increasing importance of global integration

Global integration is a critical success factor for the defence industry. Globally integrated defence companies can leverage the benefits of their worldwide footprint and optimize business results through effective operations and better value propositions. Defence organizations with latest technologies and skilled professionals offer customers timely return on investment (ROI).

The defence industry is in a state of flux with three major forces pushing it toward global integration – offsets, shift in the demand base to Asia and competitive pressure. However, as in any change strategy, the process is never smooth. Some of the challenges enterprises across defence industries have to contend with are:

- ▶ **Engineering collaboration:** Collaborative designing of products with engineers from different parts of the world.
- ▶ **Operations collaboration:** Global manufacturing with specified quality and timely delivery.
- ▶ **Logistics:** Coordination of the movement of goods through global supply chains.

- ▶ **Infrastructure:** Enhanced pressure on IT resources and other infrastructure elements to support global engineering, operations and logistics.
- ▶ **National regulations and taxes:** Adherence to regulations, laws and taxes imposed by countries.
- ▶ **Culture:** Accommodation of different languages, customers and practices in cultures around the world to meet business goals.

### International Defence Industries

We will study the defence Industries of some developed countries (with the perspective given above) as well as lessons for the Indian defence Industry.

## US defence industry

### Overview

The US has the largest defence market in the world. Significant global events contributed to its evolving dynamics. The end of the cold war was followed by a sharp decline in defence spending across the world. Global defence spending fell from USD1,300 billion in 1989 to USD800 billion in 1996. The US defence market, which had emerged as the number one consumer of defence products, consolidated its supply base. This had far-reaching consequences. Five large globally renowned defence companies in the US – Lockheed Martin, Northrop Grumman, Raytheon, Boeing and General Dynamics – emerged as the key players in the arena.

However, the slowdown in defence spending ended with the unfortunate September 11 attacks, which highlighted the rising dangers of terrorism. Policy makers in the US also realized that the threat to US interests still remains and hence, supremacy in defence equipment needed to be retained and re-affirmed.

Further, in view of the changing dynamics of the global defence industry, the US joined hands with its allies to face future hostilities and also adopted a model that shifted from concentrating on the lone capacity of the US to the combined capacity of the US and its allies. By 2007, it was evident that defence spending across the world was on a rise. This is partly evident in the 2007 revenue figures of the top 100 largest defence contractors, which stood at USD347 billion as compared to USD314 billion in 2006.

## Industry structure

The US Department of Defence (DoD) defines the procedure for domestic procurement in connection with foreign sales. This is strategic in nature and aimed at creating a regulated environment. The US DoD has defined two alternative methods of procurement, i.e., Foreign Military Sale (FMS) and Direct Commercial Sale (DCS). While FMS is routed through the US Government, for DCS, the buyer country needs to transact with the contractor directly. All procurements from the defence industry needs to be approved by the US Government and published if the procurement value exceeds a defined amount. Unlike other countries, defence business in the US operates in a highly regulated environment.

The Pentagon - headquarters of the US DoD, accounts for around 40% of global military sales, which means that the balance is supplied by the private sector. Seven out of the top 10 defence companies are US-based, and in 2004, they together accounted for 50% of global sales. Huge private sector participation in the defence industry indicates strong and seamless interaction between the government and industry. The National Defence Industrial Association (NDIA) is a leading defence industry association, which promotes national security. The NDIA also provides a legal and ethical forum for exchange of information between industry and the US Government on national security issues.

The Pentagon and private companies in the US Defence market are assisted by smaller companies that play a major role in the supply chain. This is in line with the practice in other countries. The US Small Business Administration and the government are committed to help small businesses grow and govern the welfare of small-scale companies in the country. A report, dated May 2007, claims that since 2001 to the third quarter of 2006, small businesses in the defence sector in the US won 65% of the total number of A-76 contracts (special circular for contracts with the private sector).

## R&D structure

Defence Advanced Research Projects Agency (DARPA) is the central R&D organization for the US DoD. Various recent reports suggest that the US defence sector has not been able to maintain adequate R&D levels, and hence, the US defence establishment is increasingly reliant on the private sector for its technologies. As industries such as software and integrated circuits developed faster in the private sector

than in the defence sector, the DoD turned towards the private sector to acquire state-of-the-art technologies.

Within US, spending on the defence sector (rising at the rate of 4% since 2002), R&D has received the maximum share and has grown at the rate of 11% since 2002. Clearly, the US has invested in the R&D sector appropriately and seen significant technological development, which has taken it far ahead of all the defence industries worldwide.

## Offset and industrial participation policy

The US does not have an offset or an industrial participation policy of its own because of its role as the biggest global supplier. It supplies defence equipment to many countries around the world and is therefore bound by the offset regulations of each country. US government reports show that these countries demand huge offset favors from the US. Between 1993 and 2006, US defence companies reported 8,660 offset transactions in 42 countries, which were valued at USD42 billion.

Such huge offset transactions and investments in other countries is inviting criticism from the public, which not only condemns the rising loss of jobs but also recognizes that such investments in developing nations will create companies that may subsequently threaten the number one position of the US in the world defence market. This is the reason for the US Government being under immense pressure to introduce a more comprehensive offset policy which will achieve the following:

- ▶ Clearly address the effect of the offset obligations on the US industry and sub-sectors
- ▶ Negotiate better with foreign countries to limit the adverse effect on the US economy
- ▶ Adopt policies that will help the US to use offsets to its own advantage

Countries such as Israel, South Africa and South Korea, to name a few, have now joined the list of defence exporters, primarily due to the offset obligations met by the US. It is reported that as a result of one of the offset agreements (in 2003), valued at approximately USD6 billion, Lockheed Martin Investments (in Poland) has reaped significant economic benefits in excess of USD9 billion (far beyond the 10-year lifespan of the offset program). Proponents of offset in the US argue that offsets are worth the cost – that offset agreements attract foreign countries to buy older generation defence equipment, whose product lines would have been shut otherwise.



### **Contribution of US defence industry to national economy**

Being the leader in the defence market has helped the US to achieve supremacy and all other downstream sectors in the country stand to gain from this. Various sectors including software/ IT, machine tools, speciality metals, shipbuilding and aerospace have largely benefitted from the demands rising out of the defence industry. The US defence industry promises a safe livelihood to its citizens and helps to create a safe business environment in today's globalized scenario.

### **UK defence industry**

#### **Overview**

UK has the world's second-largest defence industry. Historically, European countries have owned and controlled their indigenous defence manufacturing units. After the cold war, the UK industry witnessed the exit of some domestic prime contractors and the entry of overseas suppliers.

The role of the UK defence industry has widened now and the UK Defence Ministry is highly dependent on industry, not only for equipment but also for a wider range of products and services. Going forward, the UK Defence industry is expected to play a larger role with more defence budgets reaching out to the industry.

UK's defence budget is set to increase from GBP32.6 billion in FY08 to GBP36.9 billion in FY11. In real terms, it is expected that defence spending would be 7.5% higher by FY08, as compared to FY98. In addition to high defence spending, the reason for the thriving UK defence industry could be the sophistication of demand, market openness and diversity of supply.

In addition to high defence spending, market openness, diversity of supply and demand for sophisticated weaponry, all contribute to building a thriving defence industry. As in any other sector, the UK defence industry is driven by a profit motive with a promise to deliver to shareholders and tax payers.

#### **Industry structure**

The UK Defence industry is not just a domestic supplier alone, but is also the largest defence exporter after the US. Major players in the UK defence industry include BAE Systems, Rolls Royce, Smiths Group, VT and QinetiQ. Many of these players have bought US-based companies to increase their market share. While the focus is on large companies to leverage the benefits of acquiring end-to-end delivery, the role of small companies, including SMEs, as a part of the supply chain cannot be ignored. The major defence companies significantly rely on lower tier companies for their input and at times for niche output.



The 21st Century Supply Chain (SC21) concept was introduced at the Farnborough International Air Show in 2006 to accelerate the competitiveness of the UK aerospace and defence industry. It aims at achieving efficiency by way of common audit, process improvement and co-operative relations at all levels. Eight regional partners have been identified who are responsible for regions in the UK and all the companies, especially SMEs that wish to be a part of SC21, need to go through the regional partners.

#### R&D structure

UK's R&D Board is chaired by its Chief Scientific Adviser. It sets the strategic intent for all defence R&D activity and endorses expenditure on research. The Board oversees research and development at strategic levels and ensures alignment with defence needs, driving the delivery of the R&D elements of defence industrial and defence strategies.

Intending to raise public and private sector investment in R&D, the 10-year "Research & Technology UK Government Strategy" reflects the UK Government's recognition of technology as a key driver of productivity and success. In FY08, the UK MoD placed research contracts worth GBP531 million, as compared to GBP498 million in FY07. Although investment in R&D has increased in absolute terms, it fell from 2.3% in 1981 to 1.9 % in 2005 in terms of GDP. However, with increasing emphasis on being technologically independent, the UK Government has now set a target to raise national investment in R&T to 2.5% of GDP by 2014.

Traditionally, R&D was funded and conducted by the MoD, but in recent years, the ministry has been encouraging competition from industry. In July 2001, the National Defence Evaluation and Research Agency (DERA) was split into the Defence Science and Technology Laboratory (DSTL), which focuses on core defence research as an agency of the UK MoD, and QinetiQ Ltd., which is a public-private partnership. Evolving trends demonstrate the inclusion and active participation of the private sector in defence-related R&D.

#### Industrial participation policy

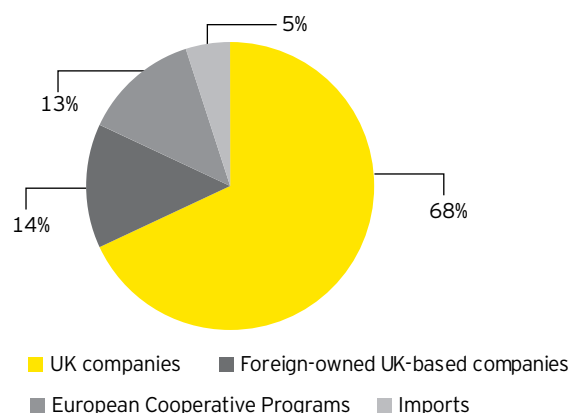
As the second-largest exporter of defence items, the UK is a defence supplier that is capable of meeting its own requirements and therefore, the industrial participation policy of the UK MoD is more a response to offset regimes in other countries which act as barriers to UK companies.

Both direct and indirect participation are allowed under UK Intellectual Property (IP) rules, wherein "direct" refers to

direct supply to the UK MoD and indirect means defence work with UK companies on third party sales. While the threshold limit under the UK IP is GBP10 million in value terms, this is relaxed to GBP50 million for French and German companies, to comply with bilateral agreements between European countries.

A procedure has been laid down by the UK MoD, which requires a foreign company to annex IP proposals to their bid, and agreements are negotiated by the MoD during the bidding phase. Needless to say, the terms of the offset agreement help the MoD to decide on the successful bidder. In the first year, i.e., 2003, 300 British companies won contracts for a total of GBP600 million through the IP system.

**Exhibit 28: MoD spending on defense industry, 2005, in %**



Source: Defence Industrial Strategy, 2005

The UK MoD has developed close working relationships with a number of integrated prime vendors in recent years. According to the MoD, during the period 2001-2004, over 70% of its requirements were met as a result of competition, of which over 90% entailed commitments of USD180,000 or less.



## Exhibit 29: Top direct suppliers to the UK MoD

Company	Base country
BAE Systems	UK
QinetiQ	UK
General Dynamics	US
MBDA	UK/France/Italy
Rolls-Royce	UK
AugustaWestland	Italy
Serco	UK
BT plc	UK
EDS Defence	US
Fujitsu Services	Japan

Source: Defence Industrial Strategy, 2005

### Contribution of defence industry to national economy

**Employment:** In 2007, the UK defence sector employed 310,000 workers in direct (165,000) and indirect employment (135,000).

**Exports:** In 2007, the UK industry won defence export orders worth close to GBP10 billion. This equaled a share of around 30% of the global defence export market. SMEs were also successful in the export market, securing around GBP300 million worth of new orders in 2007.

## The French defence industry

### Overview

From its inception, the French defence industry has been export-driven. It exported arms to America during the First World War, and by the 1970s, arms exports became a key component of the French trade structure, helping it maintain its balance of payments and economic growth.

Currently, France is the third-largest defence exporter in the world, after only the US and the UK. Consolidation of the defence industry and the coming together of the various European communities to form the European Union (EU) led to the constitution of the European Defence Agency (EDA) in July 2004. EDA was constituted to sustain the European Security and Defence Policy with the following prime functions:

- ▶ Developing defence capabilities
- ▶ Promoting defence R&T

- ▶ Promoting armaments co-operation
- ▶ Creating a competitive European defence equipment market and strengthening the European defence, technological and industrial base

EU members are eligible to join and are free to leave the EDA. France, along with other EU countries such as the UK, Germany, Luxembourg, Malta, to name a few, are part of the EDA.

### Industry structure

General Direction for Armament (DGA) is a technical service of the French MoD which acts as an interface between the armed forces and the defence industry. The military requirements of the armed forces have been identified as procurement, research and development programs under DGA direction and procurement. In addition to procurement, the DGA is engaged in production of arms.

The French defence industry is broadly composed of three distinct organizational structures. The first structure is the arsenal and shipbuilding complex, which functions under the directions of the DGA. The second structure includes semi-public firms, which produce military and civilian goods. Here, the DGA is responsible for the military part of the output. The third and the fastest growing arm of the French defence industry is the private sector.

### Restructuring and privatization

In September 1991, France approved a partial privatization (up to 49%) of its entire nationalized sector, including banks, insurance companies and defence contractors. There were a number of obstacles for the defence industry. First, it was difficult to find buyers who were prepared to pay a good price. Second, people were cautious about buying shares in a state-controlled firm whose priorities and goals differed from those of private investors. Privatization of nationalized defence companies was uncertain.

There was however a gradual move away from the emphasis on national autonomy in arms production. The DGA concluded that France no longer had the financial means to maintain an independent capability across the full spectrum of weapon systems and needed to rationalize defence production by concentrating on its competitive strengths. In an effort to reduce overcapacity and eliminate redundancies, the government urged defence companies to pare back their product lines, collaborate with other European firms



that had complementary technological assets, and focus on “poles of excellence” where France enjoyed a technical or market advantage.

Prime contractors and their thousands of subcontractors and suppliers were asked to limit their dependence on defence work and expand their market share in commercial areas. The more a firm diversified into the civil sector, the better it could survive slowdowns in military or commercial sales. In the 1960s, Matra’s business was 100% defence, with a strong concentration on tactical missiles. By 1979, Matra had a 50:50 civil-military split, and by 1990, the proportions had shifted to 76% civil and 24% defence. French firms now produce military and civil products in the same factories and rely extensively on dual-use technologies and processes, thereby improving efficiency and reducing overhead costs. The future defence industry in France will be based on dual-use technologies, which will be maintained primarily in the civil sector with DGA support.

Further, leading French defence contractors sought to reinforce their technological strengths and penetrate new markets by acquiring foreign firms and creating overseas subsidiaries.

From the 1960s through the 1980s, France emphasized bilateral collaboration with its European neighbors because such projects offered greater control and lower transaction costs. It also negotiated co-production arrangements with countries that purchased French weapons to help “offset” procurement costs and thereby promote sales. However, such collaboration was mainly on systems of secondary military importance such as helicopters, trainers and transport aircraft, while it preserved its national autonomy in “strategic” areas such as nuclear weapons, nuclear-capable delivery systems, etc.

The French defence industry is also considering acquisitions among its major firms. Dassault is looking at acquiring a stake in Thales and EADS in Alcatel.

Restructuring of its defence-industrial base also threw up a major challenge for the country in managing the economic and social consequences of cuts in defence spending. Almost 100,000 jobs were lost in the restructuring process.

#### **R&D structure**

In May 1997, the DGA reorganized its organization for defence research by creating a Directorate for Research, Studies and Techniques (DRET), which coordinated all

defence-related research in the public and private sector. France has a high budget allocation for defence and spends a considerable amount on defence R&D. However, despite the investments, it has been dependent on foreign sources for advanced technology. During the 1970s, 91% of French payments for foreign technology were to five countries, the US, Switzerland, the UK, West Germany and the Netherlands.

In its July 2006 publication, EDA indicated that there was a strong consensus within the steering committee and member countries that more needs to be done with regard to defence R&D. It emphasized that investments at that time, equaling Euros 2.3 billion a year (less than 1.3% of total European defence spending), were clearly inadequate and a higher amount needed to be allocated to defence R&D. According to the publication, the US outspends Europe by 6 to 1 in defence R&D and the EU still has a long way to go. Some of the options mentioned below were discussed by the EDA:

- ▶ New funding mechanism for collaborative research and technology projects
- ▶ Identification of key technologies which are worth investing in as they enhance capabilities
- ▶ Better definition of capability needs to identify appropriate strategy for R&T expenditure

Based on the above, the EDA endorsed the Long Term Vision (LTV) in October 2006. It defines capability and capacity needs in the timeframe of 2020 -2030. Thus, LTV assists in steering defence R&T and armament collaborations to provide the right capabilities in the long term.

#### **Exports**

The French Government takes export potential into consideration when launching a new development program. Despite such efforts, its arms exports have declined sharply in recent years, particularly since the end of the Iran-Iraq war in 1988. Exports were 18% of its defence production in 1970, rose to 42% in 1985, and stabilized at around 33% in 1988. From a highpoint of USD11.9 billion in 1984, orders fell to USD4.8 billion in 1986 and USD3.9 billion in 1989. Although the industry recovered some lost ground in 1990, with orders of USD6.4 billion, it declined again in 1991. The French government is trying to revive its arms exports.



### **Offset/Industrial participation policy**

France has an offset policy, but it is not legally binding. It does not take offsets into account as an award criterion for the purpose of selecting the winning bidder. It also does not accept offsets as a matter of policy and is one of the participating members of EDA, along with Germany, who want offsets abolished within Europe. France is largely an export-oriented market and its imports are increasingly European.

### **Contribution of defence industry to national economy**

The defence industry in France is its largest employer. It is export-oriented and has historically used arms export as a means to maintain its balance of payments. Other sectors of the French economy are highly dependent on the defence industry as it procures significant domestic and international demand and thereby creates a demand for other sectors.

## **Israeli defence industry**

### **Overview**

The consolidation of the Israeli defence industry can be traced back to the early 1920s, when they first produced weapons and ammunition. The formalization of the defence sector in Israel started in the 1950s with the establishment of many defence organizations - production, research or maintenance. An R&D division established within the Israel MoD in 1952 was reorganized in 1958 as a separate entity – Rafael – which, over the years, turned it into the country's central defence development organization.

Bedek, established in 1953 for the purpose of maintaining and refurbishing aircrafts, later developed into the Israel Aircraft Industry (IAI). Several refurbishing and maintenance centers were also established in the army to maintain armored and support vehicles. The sector was opened up to the private industry, and several privately-owned defence firms were established in the 1950s.

However, it was only after 1967, following the French embargo on arms, that Israel embarked on an all-out policy of self-sufficiency, trying to develop and produce all its defence needs. By 1981, Israel had unlimited potential in the military, industrial and security fields and was able to produce everything it needed to protect itself.

### **Industry structure**

Israel's defence Industry can be divided into three broad categories:

- ▶ Israel Aerospace Industries, Rafael and Israel Military Industries are large state-owned firms. They mainly develop and produce defence systems.
- ▶ Private defence companies of large and medium size: Three of the key firms in this group, ELOP, Elbit Systems and Elisra, concentrate almost entirely on defence products. The other firms in the group, such as ECI and Tadiran, mainly produce civilian products (communication equipment), but have defence system divisions.
- ▶ There are small private firms that only produce specified types of defence equipment. For example, BVR develops computerized aircraft simulators; astronautics manufactures command and control systems.

Apart from the three groups mentioned above, there are several large refurbishment and maintenance centers that are part of the army's Division of Technology and Logistics. These centers maintain armored vehicles, aircraft, communication equipment and other support devices that are used by the military forces.

### **R&D structure**

Massive and innovative R&D investments by the Israel Government have contributed to the development of high-tech capabilities in the private sector. There is a much greater reliance on outsourcing and sub-contracting of production and R&D among defence contractors. Today, Israel is successfully awarding top-secret production and upgrading and R&D contracts to private Israeli firms. This has enabled shortening of development time and costs, as well as the development of some unique weapon systems that are suitable to the conditions in the Middle East and to the special needs of Israel's defence forces (IDF).

Further, Israeli R&D in this segment is aided by its higher education system in science and engineering, research community and work force, which constitutes engineers and scientists. It is estimated that around half of the scientists and engineers employed in its industrial sector currently have worked with the defence industry.

### **Industrial participation policy**

The defence sector in Israel has had a fundamental impact on the development of its technological and industrial capabilities. Israel's small size and its economy, the common background of military service for almost all citizens and its large number of engineering schools have created a basis for open communication between military professional staff and industry. Engineers, scientists, managers and officers moving from the defence industry or the military to the civilian sector have applied the knowledge and training they acquired in the defence sector to civilian projects.

As a result, advanced technologies that were originally developed and utilized for military purposes are now being used to develop commercial products for civilian use. Factors such as highly skilled engineers, good geographic location and some tax and custom benefits have resulted in various international firms setting up their operations in the country.

Some companies have entered the market by setting up operations directly, whereas others have opted for friendly takeovers of small Israeli firms. Many international firms also maintain a presence in Israel by virtue of their minority holdings in Israeli start-up companies. This phenomenon began a few years ago and is expected to continue. These minority shareholders also invariably hold options for share increases.

International firms, which established local research and development centers in Israel in the 1970s and 1980s, have also helped to bring the know-how and the operating procedures of large conglomerates to local, inexperienced firms. This has exposed Israeli industry to new areas, primarily in the telecommunications and semiconductor industries.

### **Contribution of the defence industry to national economy**

Israel's high-tech industry has experienced an unprecedented rate of growth which began in the early 1990s. This growth is evidenced in its total sales – 1997 sales totaled USD7.2 billion, a growth of 10.7% over 1996; USD5.6 billion in 1997, a growth of 14.2% over 1996 in exports.

Moreover, advanced technologies developed in Israel are in great demand, and many Israeli-developed applications can now be found in the products of multi-national companies in the communications, computers, information systems,

medicine, optics, consumer goods and software sectors.

Studies have shown that R&D-intensive, high-tech companies have been a major factor in the growth of exports over the years, especially in electronics, optics, electro-optics, lasers, computer-based equipment, robotics and aeronautics.

Moreover, in the last two decades, developments in its industry have contributed significantly to Israel's information technology and telecommunications industries.

## **South African defence industry**

### **Overview**

South Africa's arms industry was established with British help just before the Second World War. During the war, the arms industry manufactured a substantial amount of basic weaponry for the Union defence force and the allied forces, e.g., armored cars, bombs and ammunition.

During the 1950s and early 1960s, South Africa relied heavily on arms imports (mainly from Britain). However, its withdrawal from the Commonwealth in 1961, and the imposition of a voluntary United Nations arms embargo in 1963, provided the impetus for a shift toward the establishment of a domestic arms industry.

As a result, the Armaments Production Board was established in the country in 1964 to control the manufacture, procurement and supply of all armaments for the South African Defence Force (SADF). In 1968, its name was changed to the Armaments Board and it was tasked with the procurement of armaments for the SADF and ensuring the optimal utilization of the private sector for arms production.

In the same year, the government established the Armaments Development and Production Corporation (Armcor), which was later merged with the Armaments Production Board. The Defence Ordnance Workshop and the Ammunition Section of the South African Mint became Armcor's first full subsidiaries. In subsequent years, Armcor took over various private sector companies such as Atlas Aircraft Corporation, and established a number of new production and R&D facilities.

In the early 1980s, the country's domestic defence industry expanded considerably on account of increasing

international opposition to apartheid and worldwide demands for a mandatory arms embargo against South Africa. It prompted major reorganization and expansion of its defence industry, which by the end of the 1980s, was able to meet the demand of SADF.

### **Industry structure**

South Africa's defence industry is managed by its Department of Defence (DoD). Important organizations in the DoD include:

- ▶ Armaments Corporation of South Africa (Armcor): DoD is the executive authority responsible for Armcor, which acquires defence material for the DoD and for any other arms of the state that may require such services approved by DoD.
- ▶ Denel Group: The Denel Group operates in the military aerospace and landward defence environment. It is a key domestic supplier to SADF. Apart from being an original equipment manufacturer in certain product categories, Denel is also expected to overhaul, maintain, repair, refurbish and upgrade defence systems in SADF's arsenal.

### **Industrial participation policy**

Offsets or "Industrial Participation," as it is officially referred to in South Africa, became mandatory for all government purchases in September 1996. In April 1997, the country's Cabinet approved the National Industrial Participation (NIP) policy and operating guidelines for all government departments. The IP commitments are divided into three categories:

- ▶ Direct offsets: Defence-related offsets (around 20% of the total or R14.5 billion), including direct purchases from the local defence industry; technology transfers and export orders for local defence firms;
- ▶ Indirect offsets: Counter-purchase by the foreign defence suppliers of non-defence goods and services from South Africa, known as Defence Industrial Participation;
- ▶ Inward investment in South Africa's defence and non-defence industries by foreign defence suppliers and other companies associated with the suppliers, known as National Industrial Participation

Defence Industrial Participation is mandatory for all foreign defence purchases above USD2 million.

- ▶ Defence purchases exceeding USD2 million but less than USD10 million require a Defence Industrial Participation obligation of up to 50%.

- ▶ Defence purchases exceeding USD10 million require a Defence Industrial Participation obligation of at least 50% and a National Industrial Participation obligation of at least 30%.

Usually, Industrial Participation of at least 100% is requested. This is split equally between Defence Industrial Participation (DIP) and National Industrial Participation. DIP contributes significantly to the maintenance of self-sufficiency in key areas, the establishment of life cycle support of sophisticated equipment, earning of foreign exchange through exports, creation of domestic employment and development of defence technology.

### **Contribution of the defence industry to national economy**

The South African defence industry has become synonymous with high quality defence systems, and effectively facilitates competition of local products on international markets. Additionally, partnerships and joint ventures with international industrial organizations are providing valuable transfers of technology and expanded the country's marketing opportunities.

### **Defence industry – the Visegrad experience**

History proves that war and fear of conflict are the biggest drivers for countries to establish, strengthen and consolidate their defence. Visegrad countries such as Czechoslovakia, Poland and Hungary had a fairly sizable arms industry during the cold war period. Since the disruption of the Warsaw pact cooperation, shrinking domestic markets have put defence industries in the region under enormous pressure, resulting in downsizing. The situation improved slightly in 1990 as the Czech Republic, Hungary, Poland and Slovakia increased their military expenditure in preparation for NATO membership.

In the absence of individual captive markets, cooperation between the Visegrad countries in common projects, which could have allowed economies of scale, has generally failed due to conflict of interests. Moreover, their industrial and technological capabilities are limited in quantitative and qualitative terms. They have many similarities with Indian initiatives on defence industrial base restructuring.

- ▶ The industry is mainly the government's domain.
- ▶ The range of equipment is mainly of Russian origin and current defence procurements need to meet NATO standards.



- ▶ Due to budgetary constraints, they have the best option to upgrade their existing ageing Soviet systems.
- ▶ These countries have maintained some form of state ownership in what they consider to be “strategic enterprises.”
- ▶ The process of restructuring and industrial consolidation has been state- led and has progressed at varying speeds.
- ▶ Privatization is piecemeal and a clear strategy is not yet in place.

### **Study of these countries reveals a generic pattern**

#### **Industrial consolidation and privatization**

- ▶ The governments provided subsidies and granted low-interest loans and guarantees to attract private sector to the defence industry.
- ▶ The main part of the defence industry continues to be state-owned. There have been restructuring initiatives in the defence industry to foster specialization.

#### **International cooperation**

An offset program is in place with 20-100% limits, but foreign investment is limited to 50%. Preference is given to contracts that have transfer of technology and a JV clause.

#### **Exports**

Exports have been falling after the cold war, and presently, the export quantum is negligible.

### **Key findings**

- ▶ Most developed countries maintain some form of state ownership in what they consider to be strategic enterprises.
- ▶ Effective investments in defence R&D from the development stage will help India achieve its long-term objective of self-sufficiency.
- ▶ A flexible FDI policy will help India attract international players with requisite technology and R&D capabilities to design and develop defence products.
- ▶ To establish itself in the international market, the Indian defence industry should develop a large-scale indigenous industry that produces strategic arms and ammunitions for the global community. Offset arrangements can support this process if they are used as a means to foster modernization.
- ▶ To increase exports, defence companies in India need to specialize in niche capabilities and strengthen their relationships with international suppliers to OEMs and prime contractors.





# 5

## SMEs in the value chain and opportunities in defence industry



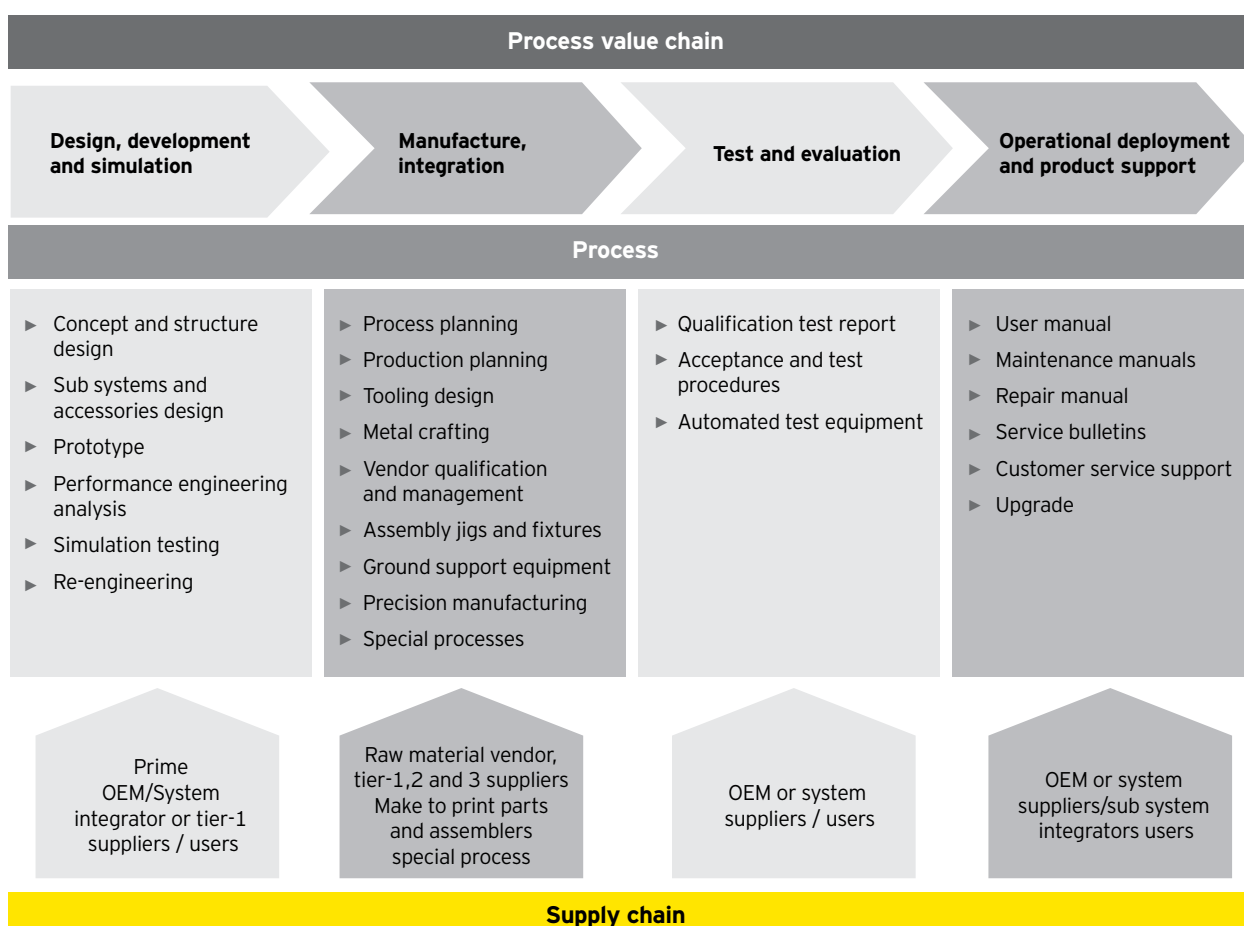
## Defence production process – value and supply chain

The Department of Defence Acquisition is the key partner for the Indian armed forces. OFB and DPSUs are the main producers and DRDO the main design agency. A large percentage of the sub-systems and components of the main equipment are manufactured through backward integration in ordnance factories and defence PSUs through feeder factories or captive units. Recent technological advancement in the private sector and relative cost assessments have prompted the defence sector to procure Commercial Off The Shelf (COTS) items from the SME sector.

With limited design and development capabilities in the SME sector for major defence equipment/major sub-systems, there is a visible gap in product development. However, this skill gap can be converted to an opportunity for SMEs by collaborating with foreign players in the areas of material technology, communication and information technology, aerospace, naval and submarine applications.

Capital-intensive defence manufacturing is characterized by a high focus on technology and complexity. The various stages in the process value addition include design, development, manufacturing and integration, testing and evaluation, product support and the service life of equipment<sup>[42]</sup>. The figure below depicts the phases of the product lifecycle process and the stakeholders in the value chain.

**Exhibit 30: Defence production process and supply chain**



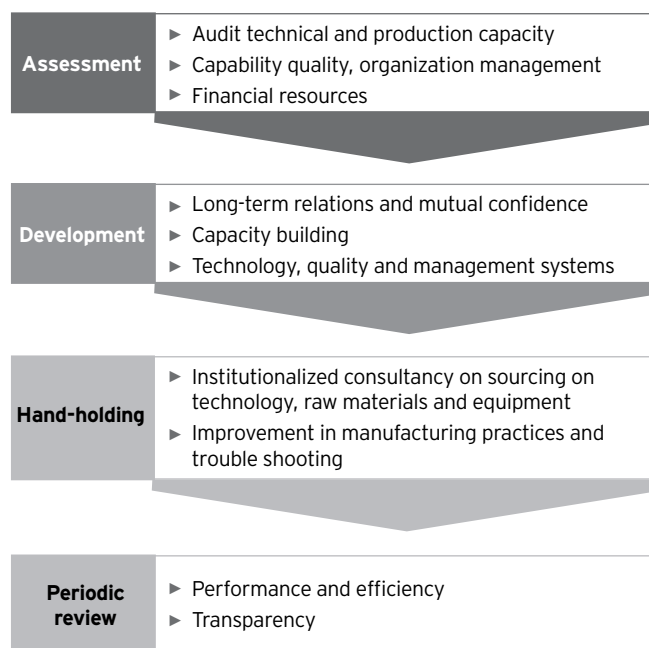
Defence manufacturers in developed countries make investments to acquire significant industry expertise and proprietary technologies. In addition, intensive technical and safety requirements necessitate investments in R&D and quality control by companies in the defence industry. Coordination and integration of supply chain practices and processes has assumed paramount importance in defence supply chain.

In the current environment, increasing competition, cost pressures, rising energy costs and high raw material prices are key challenges for defence manufacturers. To combat these challenges, manufacturers, OEMs and tier-I suppliers are leveraging the advantages arising from the globalization of the supply chain. The industry is witnessing outsourcing of elements of technology, design and component/sub-assembly manufacture. This transformation provides an opportunity for those vendors who can innovate, adopt high-level technologies, implement best practices and invest in change. The task has special regulatory requirements, hence, additional effort and input is required in the production of complex defence equipment if stringent, contradictory and ever-changing specification requirements are to be met.

## Vendor management model

As discussed above, in this fiercely competitive, technology-dominated environment, vendors have a value addition role and they need to be managed as partners. The vendor management model in a defence supply chain has many layers, each focusing on a set of deliverables. Despite restructuring and private sector participation, the crucial focus continues to be on developing subsystem suppliers as vendors. For instance, in the Indian context, Maruti, ISRO and ONGC have successfully developed and converted their vendors into true partners. The Indian defence industry needs to learn from these case studies and develop vendors as innovative partners in defence preparedness. Their technical knowledge should be utilized for speedy indigenization and closing of skill, business and learning gaps. Most importantly, the selection, development and management of partners need to be on the basis of a long-term commitment and create a win-win situation for both the parties.

### Exhibit 31: Vendor development model in defence supply chain



#### Assessment

There is a need to assess and analyze the strengths, weaknesses in the functional area of planning, control, process, tooling, plant, quality, response time and financial area and the corporate management attitude, philosophy and commitment. The assessed vendors should be placed on the select list for forwarding Tender Enquiry (TE).

#### Development

The factors which affect a vendor's performance:

- ▶ Specifications
- ▶ Communication
- ▶ Training
- ▶ Organizational structure
- ▶ Continuous improvement in processes
- ▶ Help in sourcing raw material, plant and machinery



### Hand-holding

Key aspects:

- ▶ Education and training of workforce
- ▶ Development of an accurate and responsive quality information system
- ▶ Setting up of targets for quality improvement

### Periodic review

A system of periodic review on vendor rating is required that incorporates quality, delivery, price and experience. Feedback from vendors should be given due consideration.

### Emerging global supply chain<sup>[42]</sup>

Traditionally, OEMs define and specify sub-system and structure requirements to tier-I suppliers after in-house designing in developed countries. Over the years, manufacturers and tier-I suppliers have scaled to become large-scale integrators and coordinators of production. Key trends include a greater dependence on tier-I suppliers, increased risk-sharing by them, selection of low-cost region suppliers, enhanced structures of outsourcing and transparency in project plans and schedules.

### Some developments:

- ▶ Embraer had around 350 suppliers for its EMB 145 aircraft, of which four were risk-sharing, as compared to 38 suppliers for the EMB 170/190, of which 16 were risk-sharing.
- ▶ Rolls Royce had around 250 suppliers for its Trent 500 engine, which went down to 140 suppliers for the Trent 900 and 75 suppliers for the Trent 1000. It is estimated that there will be only around 25 to 35 suppliers for the engine being developed for the single aisle/narrow body Boeing 737 RS or the Airbus NSR.
- ▶ EADS's E2S (Engineering Supplier Synergy) program reduced its engineering services supply base to just 28 from more than 2,000. Further, Airbus plans to outsource 50% of its aero structures work to its risk-sharing partners.
- ▶ Boeing's 787 is another example of leveraging a global supply chain, with aero structure work being carried out in Japan, larger amounts of fuselage work being outsourced to the US-based aero structure tier-I's, and avionics development and testing being outsourced to India through Boeing's systems tier-I suppliers.

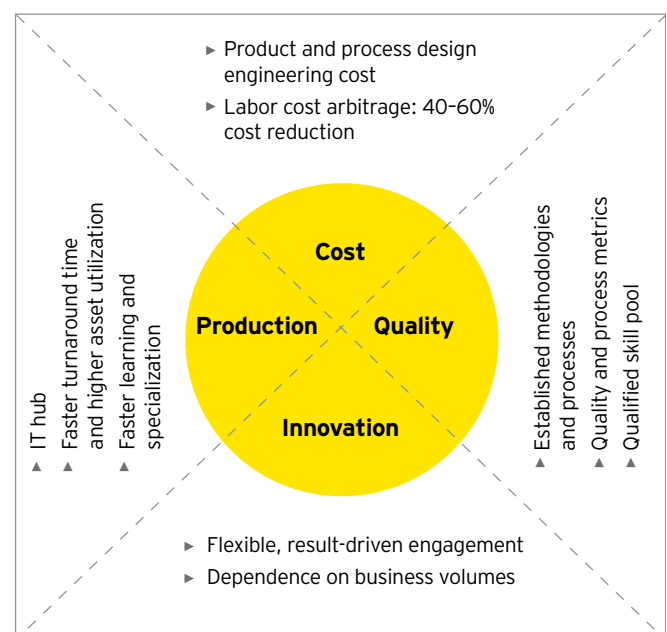
### Sourcing value proposition – advantage India

Today, India is a leading technology major and known as a knowledge and intellectual capital hub in certain key domains. Its expertise and technical know how are in high demand. However, major investments are required in design, technology and operations in the country. OEMs plan to leverage the capabilities of Indian high technology suppliers and tier-I partners, who are capable of investing in change.

The global defence industry is witnessing an enhanced focus on organization-wide learning processes, followed by the development of a whole new network of tier-II and tier-III partners. Indian defence suppliers need to appreciate processes and absorb external knowledge and learning from past and present experiences to gain the position as a risk-sharing partner.

Training and development in Indian companies is a relatively low-cost process as compared to labor costs in the West. Small and low-technology western suppliers do not usually have the financial capacity to redesign their operations significantly. These companies are facing competition from suppliers in low cost-regions such as India. The competitive advantages of Indian defence companies are shown in Exhibit 32.

**Exhibit 32: Indian SME value proposition**





## Moving up the value chain

### Cost efficiencies

Indian companies need to focus on their core competencies to downscale their manufacturing costs through multiple channels – reduced material costs or machining operations, using fewer parts and reducing assembly costs through innovation. This is expected to help OEMs derive as much as 50% cost savings on engineering design by outsourcing the process to India. The quantum of savings can thus be increased by outsourcing machining- related activities, special processing and assembly-related activities. These companies need to know how to deliver cost savings, and also understand how replacement of operations automated in the West can be replaced by skilled labor in India.

Companies derive as much as 50% cost savings on engineering design, roughly 40% in processing and assembly and around 25% in machining- related activities. These varying degrees of saving can be directly attributed to the labor content and labor cost differential between developed countries and emerging markets.

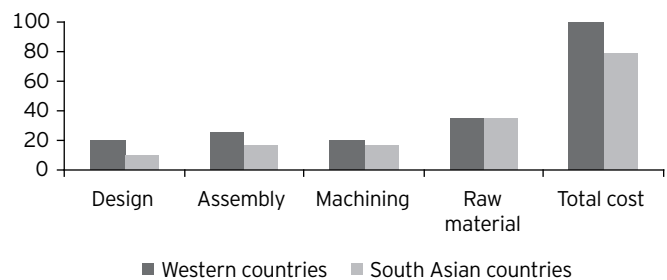
### Quality and productivity

Indian suppliers should consider breaking up their manufacturing processes and study which automated activities can be replaced by labor without compromising on quality. Substitution of automation with labor must be supported by streamlining of systems and practices, ensuring that a skilled labor force with the right knowledge is put to the task. This entails extensive training, and strict adherence to standard operating procedures and quality consciousness. The initial cost of this effort can be high due to the learning curve, but it delivers higher savings in subsequent years. Further cost savings can be achieved by formulating the process design in such a manner as to take into account the new de-automated manufacturing process.

Currently, global OEMs are not transferring high-level/ complex work in large volumes to India. Indian companies tend to receive a relatively lower portion of such work through further subcontracting by western suppliers to OEMs.

Indian suppliers require people skilled in networking, to move up the defence supplier value chain. They should also consider tapping the pool of experts who are on the point of retiring and are willing to work on a consultancy basis.

**Exhibit 33: Product cost comparison, by region, percent per activity**



Source: *De-Automation to Achieve Lower Manufacturing Costs*, QuEST Global Manufacturing<sup>[43]</sup>

### Innovation

Innovation is the key to underpinning the defence industry's productivity and economic success. It opens up boundaries, revitalizes energies and improves synergies on thought leadership in the defence industry space. In fact, innovation is imperative to improve our solutions, equipment, processes and services to the armed forces. Innovation plays a key role in the defence strategy, underlying the need to be on guard always. India needs to stay ahead in the race by applying technology innovations against conventional and emerging threats. It needs to respond quickly as new threats emerge and evolve, especially now that global communication and the world-wide web allow unrestricted proliferation of these threats. Policy- makers and our political and industry leadership have the onus of developing a strong and innovative science and engineering base in research agencies, the industry and in universities to meet this need.

The MoD's commercial approach is not always applied in a flexible, transparent or fast enough way to engage innovative suppliers, including SMEs. There is a tendency for the MoD and the industry to apply terms of business through historical precedent, irrespective of the type of R&D being procured. Further, there are often perceived risks of the long-term sustainability of supply from SMEs.

The MoD must encourage innovation from within its existing supplier base and also broaden this base to include other innovative suppliers not traditionally associated with defence. Further, the government should also:

- ▶ Ensure that organizations (including SMEs), who provide innovative technologies to prime contractors, are fairly rewarded for their contribution



- ▶ Develop a partner and consortium-based approach to technology (with shared incentives) to encourage innovation, including the ability to integrate emerging participants
- ▶ Facilitate transition of promising technology from research funding into acquisition programs
- ▶ Develop a stronger defence industrial base, encouraging the contribution of suppliers (traditional and non-traditional) to complex solutions
- ▶ Transform research organizational structure to enable enhanced communication channels with industry, including SMEs and academia

The role of SMEs as niche suppliers of materials, products and services can be enhanced to providing novel ideas and problem-solving techniques. SMEs can facilitate innovation through early exploitation of new technology, providing products or services in new or underdeveloped markets, or by using innovation to differentiate themselves from established market players.

### **Private / SME sector opportunity**

India aims to facilitate greater private sector participation in the area of defence goods production. The participation of SMEs in the defence sector is expected to increase exponentially in the next couple of years. The defence sector offers immense opportunities for them in various fields. As India is likely to be a manufacturing hub for defence equipment, the SME sector needs to gear up to play an important role as a supplier of various components for the development of the defence manufacturing industry. Rising defence procurement, especially in communications and IT equipment, presents an exciting opportunity for Indian industry to upgrade itself, since the offset policy does not differentiate between the private and public sectors.

There are more than 6,000 companies supplying around 20-25% of components and sub-assemblies to state-owned companies. The current defence market for private sector firms in India, which includes outsourcing from DPSUs and OFs, is estimated to be USD700 million and is expected to increase further, driven by the industry's determination to increase private sector participation.

### **Future technology – Indian defence industry**

The Indian defence industrial base needs to ramp up the design and production capabilities in the following technology areas:

- ▶ Thermal imaging, image intensification and infrared based equipment
- ▶ Sensors, detectors, radars and early-warning systems
- ▶ Wireless and mobile surveillance systems and IP surveillance solutions
- ▶ GPS and GSM-based tracking systems
- ▶ Interception and monitoring systems
- ▶ Trajectory correction system and missile guidance
- ▶ Advanced rocket technology
- ▶ Active tank protection systems
- ▶ Metallurgy and forging techniques for guns
- ▶ Automotive technologies
- ▶ Surveillance, communication and navigation technologies
- ▶ Miniaturization and nanotechnology
- ▶ Networking technologies for seam-less integration
- ▶ System simulators
- ▶ Access control and identification and biometric-based systems

The defence market potential for SMEs is expected to be driven by the following:

- ▶ Offset program: Foreign companies that benefit from Indian orders for commercial and defence equipment have had to plough back outsourcing work worth 30% to 50%, of the total deal size to Indian companies. This mainly benefits Indian IT companies engaged in designing aerospace and other defence systems.
- ▶ OEMs in the aerospace and defence sectors are shifting their focus to design and systems integration from vertically integrated manufacturing.
- ▶ Global aerospace majors, including Boeing and EADS, are working with several Indian firms in aerospace design and manufacturing, helping them to improve their capabilities and enhance their work profile.

## Potential business value and volume

### Capital procurement

Budgetary provisions and market size are strong incentives for foreign OEMs to pitch in for their share in the market. They also provide an opportunity to local industry to leverage its capabilities for defence production for domestic use as well as for export.

The major portion of the Indian defence budget (around 54%) is generally earmarked for capital acquisition and modernization of the defence forces. Capital expenditure on defence is likely to be spread as follows – air defence, 30 % (as has been the pattern in the past); land and naval system

modernization and up-grades, 15% each; R&D around 10%; C4ISR, the new thrust area, 5%. The remaining is earmarked for other supplies such as ammunition and other systems.

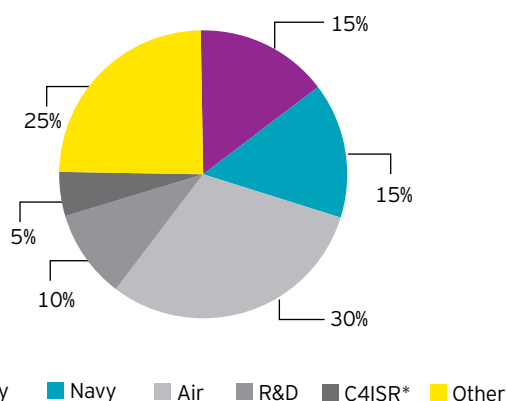
There are significant business opportunities with defence capital spending expected to touch USD22 billion by 2013. It is projected that the modernization program will make India the Asia-Pacific region's second- highest defence spender within the next five years, and the seventh-largest global spender by 2016. The total opportunities for procurement are forecasted to exceed USD100 billion by 2022, including the maintenance, repair and overhaul (MRO) market.

**Exhibit 34: Defence market size in USD billion**

Years	FY10	FY11	FY12	FY13	FY14
Total budget (growing at 8%)	28.5	30.8	33.3	35.9	38.8
Capital budget (45% of total)	12.8	13.9	15.0	16.1	17.5
Revenue equipment portion (9% of total)	2.6	2.9	3.2	3.5	3.8
Total (45%+9%)	15.4	16.8	18.1	19.6	21.3
Share of domestic suppliers (46%)	7.1	7.7	8.3	9.0	9.8
Share of foreign suppliers (54%)	8.3	9.0	9.8	10.6	11.5

Source: Ernst & Young analysis

**Exhibit 35: Break-up of anticipated capital procurement, FY10-14, in %**



\*Command, control, communications, computers, intelligence, surveillance and reconnaissance

Source: MoD

### Offset opportunity

#### Defence

Equipment holdings need to be upgraded to fill the capability gap. The defence services need practically all types of weapons and systems, fighter aircraft, armored vehicles, radars, missiles, naval vessels, etc. Assuming that nearly 80% of the capital budget is allocated to capital acquisitions, of which 60% is earmarked for committed liabilities and 40% for new schemes, a substantial amount will be available for capital procurement. During FY10, more than USD4.4 billion (INR175,000 million), around 30% of the capital budget, will be available for new weapons and systems for the armed forces.

India is expected to spend close to INR4,000 billion (USD100 billion) on defence procurements during the period of implementation of the 11th Plan(2007-2012)<sup>[45]</sup>. Given that imports account for 70% of the expenditure, offset obligations worth INR860 billion (USD21.4 billion) will be generated at 30% of their contract value. The largest

contact for 126 medium multi-role combat aircraft (MMRCA) is estimated to be worth about USD10.5 billion. The tender document places a 50% offset liability on vendors.

#### Outsourcing opportunity

Global OEMs from the defence sector are shifting their focus to design and systems integration from vertically integrated manufacturing and are working with several Indian firms in design and manufacturing, helping them to improve their capabilities and enhance their work profile.

The global aerospace industry spends USD60 billion on engineering annually. Currently, India accounts for around 1.8% of this market, as compared to 12% of overall offshoring of engineering services. Today, the aerospace engineering outsourcing/offshoring market is valued at USD800-1,000 million (INR38.4-48.0 billion).

Indian companies providing the following services are expected to find buyers in the global defence and aerospace industry:

- ▶ CAD (drafting, detailing and modelling)
- ▶ CAE (finite element analysis, computational fluid dynamics, simulation and flight physics)
- ▶ Electrical wiring/harness design
- ▶ Technical publications
- ▶ Manufacturing engineering
- ▶ Avionics design
- ▶ Testing
- ▶ Integration

**Exhibit 36: Key proposals and offset projection**

Proposals	Quantity	Cost (USD million)	Min % of offset	Offset value (USD million)
MiG-29 upgrade	67	677	30%	200
Medium light helicopter	172	286	30%	85
Additional operation capability – UAV	7	71	30%	20
VVIP helicopter	12	167	30%	50
Multi Role Combat Aircraft (MRCA)	126	9,333	50%	4,650
ASW helicopter	NA	391	30%	120
155 artillery field gun	140	667	30%	200
KA 28 upgrade	NA	100	30%	30
Short range quick reaction surface to air missiles (QRSAM)	78	1,400	30%	420
Advanced MRMR planes	6	320	30%	96
Transportable radars	NA	1,200	30%	360
AFV protection and counter measure system	NA	270	30%	80
Tracked howitzers	100	2,000	30%	600
EL/M-2083 Aerostat air-search radars	9	2,700	30%	810
Air defence system	NA	1,000	30%	333
T-90s EW system	1,657	NA	NA	NA
C 130Js Transport aircraft	6	1,100	30%	330
Naval multi role helicopters	16	1,000	30%	300
Light combat aircraft engine	99	600	30%	180
Combat helicopters	22	550	30%	165
Airborne early warning and control systems	NA	400	30%	120
Ultra light howitzers	145	667	30%	200
Wheeled howitzers	185	1,000	30%	300
Diesel electric submarines	6	6,200	30%	1860

Source: Ernst & Young analysis





### SME share

Indigenous procurement and offset obligations during the forecast period is expected to generate business worth USD1.6 billion with an estimated SME share of 40%. In addition, homeland security and civil aerospace will create business worth about USD50-60 million per year for SMEs.

**Exhibit 37: Projected workload of private sector in USD billion**

Years	FY10	FY11	FY12	FY13	FY14
From domestic suppliers	2.2	2.4	2.6	2.9	3.2
From foreign suppliers	1.9	2.1	2.3	2.6	2.8
Total private share	4.1	4.5	4.9	5.5	6.0
SME share @ 40%	1.6	1.8	2.0	2.2	2.4

Source: Ernst & Young analysis

### Emerging opportunities and challenges for SMEs in global value chain (GVC)

There are ample opportunities for SMEs to establish a pivotal role in a global value chain for multilateral and regional free trade agreements, policy liberalization in the areas of trade, investment, technological innovation in transportation, information, communication, new management principles such as JIT and ERP and supply chain management.

The global economic slowdown and cost pressures are forcing manufacturers to shift their bases to low-cost countries such as India and China. India as a destination offers high productivity and quality goods and services at competitive prices. SMEs in these countries have the potential to play a key role in global manufacturing by leveraging lower costs and increasing local demand.

SME participation in GVCs is imperative for the productivity, expansion and stability of the sector. Technology and human capital need to be augmented with the right approach and knowledge enhancement processes to achieve global exposure, facilitate access to information, inculcate new business practices and incorporate advanced technologies. Co-operating with a network of upstream and downstream partners can enhance a firm's status, improve flow of information, increase learning possibilities and the probability of success of small firms in the value chain.

Moreover, to upgrade its position in the value chain, a small firm may take on a larger and more complex set of tasks, for example, in addition to manufacturing a product or providing a service, this may involve contributing to product development, organizing and monitoring a network of sub-suppliers, implementing internal systems of quality control, assuring compliance to an increasing set of standards, and ensuring delivery and quality at competitive costs.

However, inadequate working capital can be a barrier to SME participation in GVCs in terms of their ability to upgrade their technologies and services. Further, their cash flow can also be affected adversely through payments that are delayed from international partners.

### Some key challenges

#### Technological issues

Technical know-how and skills come at a premium. Naturally, competitiveness at the company level depends on cost efficiencies and speed to market. Similarly, the creation and emergence of newer markets and customers depends on the speed with which scientific and technological breakthroughs are converted into practical and attractive solutions.

SMEs have been unable to keep pace with the globalization of product and service markets. They lack the capability to identify new technical sources and evaluate alternative technologies. Moreover, they require guidance from larger enterprises, R&D, academic institutions and centers of technology development. At present, there are 2,900 R&D institutions in India, of which 1350 are in the private sector. Over 1,250 are in-house R&D units and employ over 45,000 scientific and technical personnel. These facilities are not available to the SME sector.

SMEs have unique software and hardware requirements that suit their business model which require flexibility in terms of features, cost, delivery model and maintenance. Customized software models often cost more as compared to off-the-shelf products.

#### Inefficient marketing network

SMEs are unable to effectively market their unique selling propositions and specialized offerings due to their limited resources and lack of awareness about new and effective marketing models. In an SME business environment, networking is the key element for gathering information and developing an effective market niche. Clusters are still at a



nascent stage in the Indian SME market. Companies in the SME sector need to strengthen ties with their counterparts to devise effective marketing strategies.

The sector also lacks a strong, new product development base and has a limited information base on marketing trends. Further, performance measurement of marketing programs is a major hindrance. Monitoring and evaluation activities are expensive and challenging for most of these programs. Such companies also need to ascertain whether marketing can help to develop businesses to market standards while remaining financially sustainable.

#### **Financial constraints**

Financial planning and management is critical for SMEs to procure working and long-term capital. Most SMEs face challenges in controlling their cash flow, justifying capital expenditure, negotiating favorable deals and balancing quality and costs. They expend an inordinate quantity of time and effort to manage credit flows.

The non-availability of institutional finance on affordable and easy terms is hindering the access of SMEs to new technologies. In India, the situation is further complicated by the fact that the preferred mode of finance is either self or from other sources.

The SME lending market currently uses a corporate lending approach as financial institutions have difficulties in servicing the wide-reaching SME sector. The limitations of such a lending approach are:

- ▶ **High processing and monitoring costs of loans to SMEs:** This is the result of complicated loan disbursement procedures.
- ▶ **Project preparation and evaluation:** SMEs often lack the ability to formulate a proper project proposal.
- ▶ **Loan review and servicing process:** This is sometimes not consistent or scalable.
- ▶ **Credit assessment:** FIs need to enhance credit assessment capabilities with regard to SMEs. The cost of their credit assessment can be reduced by recognition of clusters.
- ▶ **Assets pledged:** These are sometimes not reliable for recovering loans from SMEs.

#### **Lack of human resource policies/staffing challenges**

Finding and retaining talent, sourcing specialized skills and training are some of the key issues that SMEs need to tackle. SMEs have a predominantly horizontal organizational structure. Some entrepreneurs also have a circle of trust with a few employees. Thus, when these companies grow, it becomes more difficult for them to involve all their employees equally in operational decisions. Lack of formalization, structure and clarity in performance, training and reward management also characterize SMEs.

SMEs usually do not get the creamy layer of talent and are often left to hire young professionals with little or no work experience and train them on the job. Moreover, they cannot afford large bench resources and have to hire people only when they need them. Further, to retain manpower, they have to continuously upgrade their technical skills through training. Further, skilled manpower tends to migrate toward larger enterprises, which provide higher wages and greater job security.

#### **Ability to pay competitive wages**

To retain their manpower, SMEs need to pay competitive wages. However, as already mentioned, inadequate financial planning and delays in receiving dues are fairly common problems faced by them. Not only are they unable to pay competitive wages, as compared to large enterprises or government organizations, but they are often unable to pay wages at all until they receive payment from their customers.

There are a number of targeted support programs that must be initiated to enhance the development of the SME sector. These include:

- 1) Raising awareness of the potential opportunities in GVC:
  - ▶ Access to accurate information on market opportunities and potential foreign partners through market reports and databases
  - ▶ Facilitating information flows throughout the entire GVC and providing a platform to share strategic intent between large enterprises and SMEs
- 2) Promoting collective action and co-operation:
  - ▶ Facilitating the establishment and development of industry groupings on regional, cross-regional or cross-border levels

- ▶ Engaging in joint bidding, production and marketing, particularly for government procurement programs
- ▶ Funding co-operative research programs
- ▶ Providing technological support, particularly for knowledge-intensive and export-oriented market segments
- ▶ Promoting business linkages between large enterprises and SMEs
- ▶ Facilitating supplier development programs, where SMEs are coached and mentored in key areas such as design and production engineering

### 3) Promoting innovation:

- ▶ Supporting training and capacity building through skill and business development service programs
- ▶ Establishing logistic technology centers to accelerate the rollout of supply-chain management technologies and processes
- ▶ Promoting technical partnerships between SMEs and foreign organizations
- ▶ Providing marketing and organizational assistance to implement new ICT systems

### 4) Enhancing value obtained from intellectual assets and intellectual property (IP):

- ▶ Promoting intellectual asset-based management and developing systems to value intellectual assets
- ▶ Raising awareness of the nature of IP rights and how they benefit SMEs
- ▶ Creating and promoting online IP marketplaces where SMEs can showcase their IP offering
- ▶ Facilitating the process of filing of patents by SMEs
- ▶ Providing financial and legal instruments for SMEs to acquire or adopt intellectual assets and IP rights developed in universities and research centers
- ▶ Encouraging SMEs participation in negotiations for IP rights in the establishment of treaties or international agreements

### 5) Facilitating adoption of product quality and process standards:

- ▶ Providing information and professional training to implement product quality standards required for exports
- ▶ Encouraging SME participation in the standard-setting process through the provision of information on standardization and accreditation activities
- ▶ Facilitating seamless national certification systems

## Key findings

- ▶ To promote SME participation in defence, efforts should be made to provide them with access to information on business opportunities globally to enable them to build relationships with international SMEs in global defence programs,
- ▶ To move up the global defence value chain, SMEs should focus on innovation, building intellectual property, and adopt quality and process standards to be able to offer complete sub-systems or assemblies as well as testing and certification services
- ▶ Tailor made courses on specific categories in aerospace and defence should be offered at all levels of education in Indian educational institutes through industry-government-institute partnerships
- ▶ There should be rapid development of domain knowledge in the private sector by hiring and training of engineers from leading engineering institutes with support from aerospace and defence sector specialists from abroad.
- ▶ Common facilities for design, testing and simulation should be established in SME clusters, as required, on a pay-per-use model.





## Case studies

### ISRO: Effective industry participation<sup>[51, 52]</sup>

The Indian Space Research Organization (ISRO) was largely reliant on international technologies for its various programs. It depended on foreign suppliers for major systems and components. Globalization, the rise of countries such as India, China and other developing countries, the propagation of the flat world theory, world integration and India's successful forays into the space and nuclear area have turned the spotlight on ISRO. ISRO feared that this success would be accompanied by sanctions and other restrictions that would bring in challenges.

ISRO's solution to this challenge focused on a long-term approach that works well for the country, its private and public sectors, and of course, the manpower and intelligence associated with these industries. The core intent of the approach is to optimize India's inherent resources, intelligence and people capabilities, as also support and encourage the private sector during the development phase. This approach also works on a non-exclusive and merit-based licensing selection process. It has helped to cultivate an environment where there is consistent scaling up, adoption of process and technology audits to ensure international competitiveness and formulation of steering policies, taking into account the international environment.

This case study traces the roadmap and solution adopted by ISRO to pre-empt the challenges mentioned above. As a result of this foresight, ISRO has been able to continue with its design, development and execution uninterrupted. This is a study on intelligence, pertinent strategy and timely action.

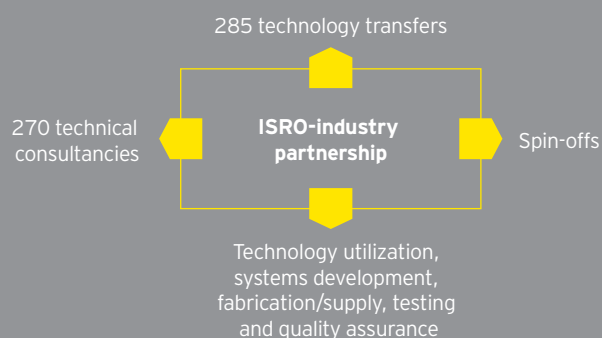
ISRO's leadership decided to protect itself against possible sanctions at the outset. The strategy and change management process adopted by the leadership was to look into India's inherent industrial capabilities. It adopted a policy that ensured maximum utilization of industrial capability in the private and public sectors. Over the years, the level of industry participation gradually increased, in sync with the requirements of the program. Apart from fabricating hardware for satellites, launching vehicles and participating in building ground infrastructure, industries are being encouraged to engage in system-level fabrication and integration activities, either independently or through a consortium.

ISRO continues to give a thrust on cooperative ventures to Indian industries to enable them to achieve self-sufficiency. This ensures that the intelligence developed within the country is used effectively and also makes our processes more secure from a national security threat perspective.

More than 500 small, medium and large-scale companies participate in these programs in the form of hardware development and supply; they also provide software and other services. Almost 60% of a launch vehicle's cost flows to Indian industries. Recent developed applications for tele-education and tele-medicine incorporate nearly 100% of ground segment equipment/services. It is significant that this core development has taken place in India.

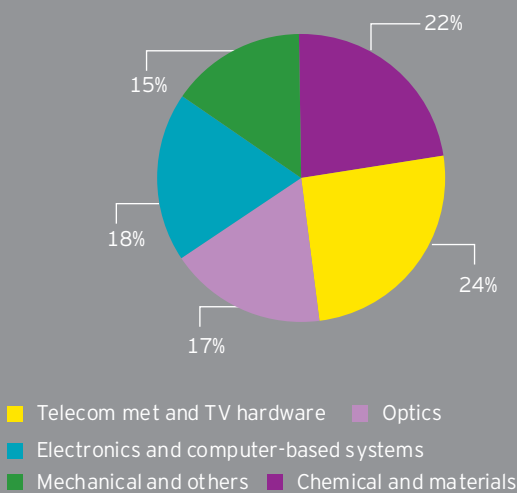
As for rockets, 80% of the work involved was executed through industries as compared to only 40% for satellites. ISRO is working to enhance the participation of industries in the satellite area as well. The private sector has assumed a role of paramount importance in the field of satellite communication, with a large array of services such as broadcasting, a V-Sat network, the internet, a ground system and training/education services. The geo-spatial information services (GIS)/remote sensing program includes more than 200 companies and employs over 12,000 professionals. In addition, around 20-30 SME firms join the GIS program every year.

In its endeavor to develop new technologies, ISRO partners with appropriate industries by outsourcing components and sub-assemblies. It provides in-house facilities, shares knowledge and resources, and initiates joint investments and unique test facilities. In addition, it transfers technology to private sector vendors and provides support through documentation, training, provision of components, prototype testing, commissioning of production as well as marketing and export promotion.





### Spectrum of technologies transferred



Source: *Building Indigenous Space Industry Capacities, the Indian Experience*, K Radhakrishnan, ISRO

After establishing a close and effective relationship with the industry, ISRO now wants the private sector to play a larger role in specialized services, improve the quality and reliability of products and reduce timespan in achieving project objectives in the most cost-effective manner. The policy framework of the Indian space program envisages effective industry participation with higher levels of aggregates in system-/stage-level supply from the industry, use of ISRO's facilities by industry, technology transfer to the industry and utilization of ISRO expertise including its technical consultancy services.

### Empowering the vendor

#### Maruti Suzuki India Limited's strategic partnership initiative<sup>[55, 56, 57]</sup>

Corporations work smartly today. Manufacturing units, in particular, focus on lean and quality programs. The core intent of many of these initiatives is to achieve more, provide value to clients, partners and their own people, and in the process, be a role model for others in the same field.

Maruti Suzuki India Limited (MSIL – formerly Maruti Udyog Limited), a subsidiary of Suzuki Motor Corporation of Japan, enjoys the status of being India's largest passenger car company, accounting for over 50% of the domestic car market. Like other organizations that depend on vendor support, MSIL also faces immense challenges that require constant monitoring.

This case study traces MSIL's initiatives and strategic partnerships to form long-term partnerships with its vendors. By working proactively on a collaborative basis, it has empowered its vendors with quality production capabilities, raised their level of efficiency, and, in the process, directed this efficiency toward itself. This has improved its production capabilities significantly and enabled it to transfer some of the benefits of the savings resulting from these initiatives to its customers.

Automotive manufacturing is different from other kinds of manufacturing since the input provided by its vendors and suppliers is sizeable. Therefore, constant scaling up of quality, optimization and reduced costs are directly dependent on vendors in the sphere, who follow the same path. As in many industries and sectors, and other areas as well, the role of vendors providing support has evolved from tactical to strategic. In fact, in many scenarios, it is a working partnership. Vendors are often referred to as partners, who work in close coordination with organizations to meet their long-term goals in terms of component development, quality, delivery and cost efficiency.

Over the years, MSIL has formulated and implemented various vendor- development programs, stimulating and reinforcing local subcontracting capabilities. Not content with local capabilities, the company has looked beyond Indian shores and forged relationships with around 110 international technology companies.



### Tata Motors: on a new road to vendor development<sup>[58, 59]</sup>

Tata Motors Limited (TML), one of India's largest automobile companies, is a giant in the commercial vehicle segment and also enjoys the status of being one of the top three companies in the passenger vehicle slot in the country. Moreover, it is the world's fourth-largest truck manufacturer and its second-largest bus manufacturer.

Today, TML has diversified from being a commercial vehicle manufacturer to a low-price consumer car-maker, showcasing how a company can leverage its suppliers to drive product innovations and reduce costs. One key reason why it has been able to achieve a remarkable success is because of its successful vendor-development program.

TML has moved from the conventional procurement model, where a company creates the technical specifications for parts and then asks suppliers for their bids. Today, TML floats the proposals providing the output they expect and allows suppliers to leverage creativity in design, material and prices. This flexibility provided by TML, coupled with the creativity and innovation capabilities of its suppliers, has been instrumental in producing revolutionary automotive designs. The company has adopted this model across its products, achieving substantial cost savings and product development.

#### Supplier development program for Nano<sup>[61]</sup>

An area where TML has gained considerable success is through vendor development in developing and manufacturing the Nano. The company will only focus on major aggregates such as outer skin panels, body in white, painting, trims and fitments, and vehicle assembly. Potential suppliers need to be system/aggregate suppliers and not part suppliers. Some of the unique aspects of the Nano model include:

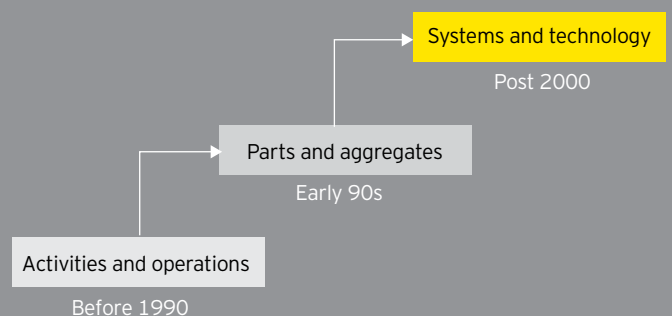
- ▶ The supplier should have the independent capability to design, develop and validate the products.
- ▶ It should have a single source policy to enable a lean vendor base and provide economies of scale.
- ▶ The supplier should have the ability to invest in the required level of automation and also have adequate management strength to meet the required scale of production by maintaining quality and delivery.
- ▶ It should be ready to set up multiple facilities near the vehicle assembly plant.

- ▶ It should have comprehensive process planning with poka-yoke to ensure consistent quality.
- ▶ The supplier should be able to make just in time (JIT), Kanban, Direct on Line (DOL) deliveries.
- ▶ It should have continuous benchmarking with best practices solutions.

#### Seamless linkages through IT applications

The company aims to enhance export competitiveness, speed and flexibility across its value chain through value chain management systems. TML has deployed ERP, SAP, supplier relations management and customer relations management to connect its different locations, dealers and vendors for efficient and seamless information exchange. Further, Omnex has partnered with TML and its 300+ component suppliers to successfully launch a new automobile. Omnex has also developed a process to take all 300+ suppliers through a product development process and teach them US automotive technologies including APQP, PPAP, process optimization, FMEA and control plans. After the involvement of Omnex, all 300+ suppliers successfully completed new product approvals with their customers.

#### Evolving role of SMEs in TML's supply chain



#### R&D

TML pursues research and development initiatives in the areas of product development, environmental technology and vehicle safety. The company has widened the scope of its research and development activities from in-house product and technology development to managing research and development processes across various internal and external agencies, including aggregate parts suppliers and outsourcing partners. Recently, it has inaugurated a vendor portal, which is the communication channel between new and existing suppliers and TML.



## Appendix A

### Summary of Kelkar Committee recommendations, government's stand and the ground reality

Kelkar committee recommendation	Apex Committee decision	Ground reality
Information-sharing creation of public version of Armed Forces Perspective Plans	Accepted	Not yet implemented
Entry point for Private Sector Defence Acquisition Amendment to (a) SCAPCC (b) SCAPCHC	Accredited industry to be associated in the categorization process, depending on the item under consideration	Not yet implemented
Limited consultation with industry where the TOT for the production or maintenance required before finalizing RFP, and in preparation of SQRs, when the systems mature	Industry to be consulted in "Buy & Make" category of cases wherever there is TOT  No action needed to be taken at this stage, to prepare SQRs for the consulting industry	Not yet implemented
Amendment to incorporate provision of servicing; maintenance and upgrading of procurement procedure for the "Buy" category	Accepted, but instead of maintenance ToT, should be maintenance infrastructure, to be clearly stated in the RFP	Implemented
Amendment to Defence Production Board to include representation of CII, FICCI, etc.	Amendment of the Constitution of DPB with the approval of a competent authority to incorporate representation of the industry ("RUR"/"Champion") on a case-to-case basis; unlikely for general representation of the industry association to be allowed	Not yet implemented
Setting up of committee to work out a scheme on the basis of a DARPA mode.	Need for a multi-disciplinary task force to prepare the proposal and indicate fund requirements, etc., and also how it should function; this task force to evolve a model for the consideration of the government	Not yet implemented
Devising a mechanism to provide a level playing field to the private sector industry	A proposal to provide a level playing field to the Indian industry vis-à-vis foreign suppliers in the area of defence procurement already under the consideration of the Committee of Secretaries; on the issue of nomination, information from DPSUs and OFs relating to the setting up of the Apex Committee for specific purposes and the importance of full utilization of their installed capacities	Not yet implemented
Identification of RURs/Champions	Accepted	Not yet implemented



Kelkar committee recommendation	Apex Committee decision	Ground reality
Creation of Defence Technology Development Fund	Can be accepted in principle, but the likelihood of a view being taken, with the approval of the RM, to have a provision in the budget instead of creating a separate fund on the basis of recent instructions from the Ministry of Finance on the formulation of guidelines/modalities for the operation/utilization of the fund/ budget provision	Not yet in place
Budgetary provision for R&D between the DRDO, the Defence Technology Development Fund and service HQs to be provided separately	Accepted	Not yet in place
Scheme for providing institutional support to SMEs for defence supplies	Accepted	Not yet implemented
Guidelines/Code of Practice for prime contractor involvement in maximizing SME participation in defence contracts	Accepted	Not yet implemented
Inclusion of representatives of CSIR and ISRO on the Defence R&D Board	Likelihood of association with the Defence R&D Board at the macro level on a case-to-case basis, wherever required	No known case
Manual on the defence acquisition procedure for "Make" category	Accepted	Awaited
Constitution of a committee to recommend restructuring of the MOD on the lines of DGA in France	Accepted	Awaited
Implementation of pilot projects to try a modified approach to the acquisition of items categorized as "Buy & Make"	Service HQs and DRDO to provide a list of such cases where they had already followed this procedure; a study of such cases, as well as some new projects, to be then undertaken to assess the practicability of the suggested modified procedure to gauge the improvements needed, and thereafter, taking a final view of the recommendation	Awaited



Kelkar committee recommendation	Apex Committee decision	Ground reality
DRDO to concentrate on high-end technology and offload R&D work, as much as possible, to industry implementation of schemes for parallel development on the lines of DARPA through NCSIT recommended in Para 6.7(v)	Issue relating to setting up of National Centre of Strategic Information Technology (NCSIT) to be further discussed with NASSCOM; likelihood of recommendation for implementation of DARPA through NCSIT not being accepted – as according to DARPA, matter dealt with in another recommendation	Awaited
Need for upgrading of existing platforms to be taken up by indigenous industry	Accepted	Some RFPs issued
Introduction of a policy on shared development costs in “Make” category	Accepted	Awaited
Acceptance of principle of acquiring minimum order quantity	Accepted	No known case
Placement of Fund Service Headquarters of R&D work and preparation of scheme	Accepted	No known case
Suitable guidelines for project-wise allocations of funds placed at the disposal of SHQ for R&D projects	Accepted	No known case
Preparation of proposal to strengthen IDS	Accepted	Awaited
Introduction of the concept of assessing life cycle cost in all capital acquisition projects valued over INR3 billion	Accepted	Concept yet to be fully understood
Internal process compliance arrangement to be strengthened	The possibility of a final view being taken in the Apex Committee, keeping in mind its involvement, accountability and responsibility	
Armed forces to introduce outsourcing of services to public and private sector, which will increase progressively	Accepted	No tangible progress
Development of training courses for (a) tendering and contracting, (b) project management	Accepted	No tangible Progress
Allocating funds to provide fellowship for higher studies for serving service officers	Accepted – need for post-course utilization of trained officers in service and to set up Centers of Excellence in the country by retaining such highly trained officers and creating a good faculty for long-term benefits	No tangible progress
Establishment of a national defence university	Accepted	Some progress

Kelkar committee recommendation	Apex Committee decision	Ground reality
Setting up of an autonomous body for aerospace development with the involvement of all the stakeholders	Requires greater deliberation; need for modalities for setting up the proposed aerospace body to be worked out, considering its usefulness, composition and objectives	No tangible progress
Creation of national center for strategic information technology (need for separate procurement of ICT items)	Requires greater clarity; advisable to have further interaction with National Association of Software Service Companies (NASSCOM).	No tangible progress
Need to review the whole concept of indigenization and self-reliance.	Accepted	No tangible progress
Creation of the Strategic Defence Industry Fund (SDIF) non-lapsable pool	Recommendation only linked with "Make" projects; requires further scrutiny by a group of officers to make it more workable and acceptable	No tangible progress
Introduction of offset clause in RFPs for procurement under capital and revenue budgets	Accepted	Implemented
(i) Consortium approach to international marketing (ii) Encouragement of private/public sector participation in export marketing with consortium approach (iii) Industry associations to set up export houses in selected countries	Accepted	No tangible progress
(i) Need for information on line of credit facility to be made available to DDPs from MEA (ii) Active involvement of defence industry to promote export of defence products and services to beneficiary countries under a line of credit (iii) Long-term engagement of defence industry in recipient country's life cycle product support (iv) Reimbursement of certain costs to facilitate exports	Accepted	No tangible progress

Kelkar committee recommendation	Apex Committee decision	Ground reality
<b>DRDO</b> Need to involve the industry, to initiate limited series production from the preliminary stages to product development undertaken by DRDO; vendor selection and development ideally carried out by industry, but can be taken up gradually	According to MOD, industry involved in DRDO, with the present procedure working well for initial delivery and repeat orders for relatively small numbers, but the infrastructure of these industries insufficient for larger volumes; according to DRDO, involvement of industry economically sound with several benefits, reiterating establishment of private and public partnerships in R&D and its willingness to fund in the ratio 70/30: 80/20	Initiated



## Appendix B

### Survey summary – offset impact

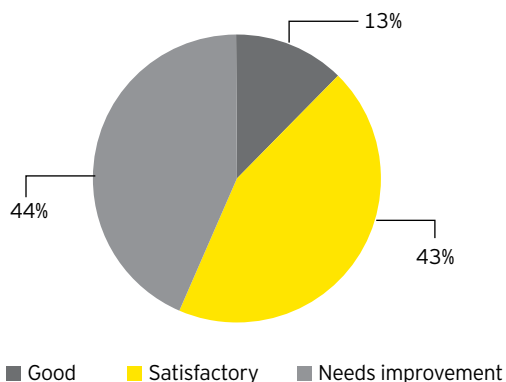
This is a sample survey conducted by CII and Ernst & Young to assess perceptions and the impact of offset-related issues. The respondents were Senior Managers from SMEs in the defence industry.

The summarized responses:

#### Awareness

The respondents were generally aware of the offset policy and were keen to participate. Around 13% of the respondents found it good and 43% were satisfied with it. However, a sizable number (44%) felt that the offset policy needed improvements to positively impact business opportunities.

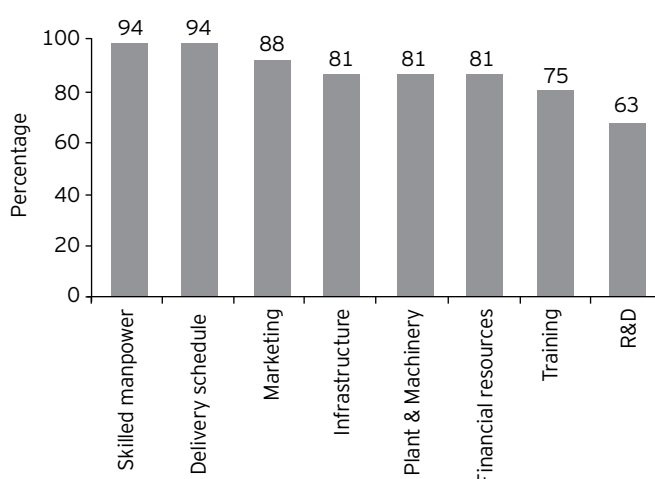
#### Rating of existing offset policy



#### Industry capability

The respondents were confident of the delivery capability of Indian companies and felt they were well poised to undertake the offset program. The high percentage of responses (charted below) provide a measure of confidence and are likely to allay fears about skills, scheduled delivery, marketing, infrastructure, plant and machinery, finances and training.

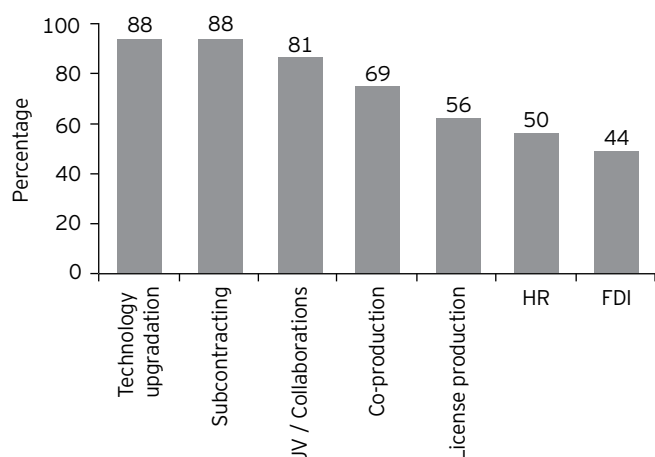
### Offset readiness of private industry



### Perceived benefits to private sector

The respondents felt that the offset policy would encourage upgrading of technology, subcontracting, JVs/ collaborations, co-production and license production. Issues such as upgrading of plants and development of Human Resources did not find similar favor. The percentage of responses against each attribute is provided in the following figure.

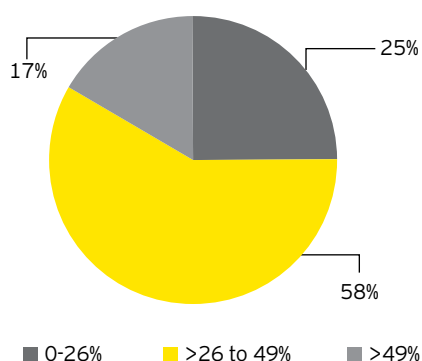
### Perceived offset benefits by private industry



### FDI limits

Around 25% of the respondents were of the opinion that current 26% FDI limits are fair; 58% wanted the limit to be raised to 49%; 17% felt that it could be beyond 49%. The 26% FDI in defence production restricts the OEM from investing in private companies. On the other hand, they will be reluctant to invest in PSUs and OFs due to conflict of interest, lack of operational control, etc.

### Opinion on FDI limits

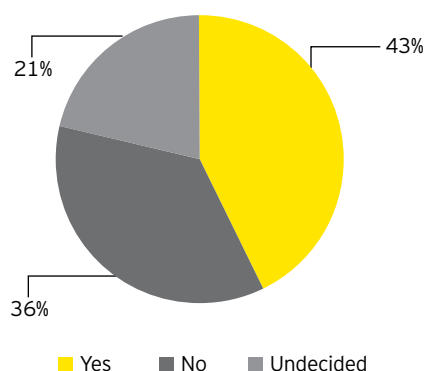


### Transfer of technology in offset

The industry was divided in its opinion regarding transfer of technology; 36% did not see it as a challenge, while 43% considered it challenging, and a large number were undecided.

The concern expressed by most people related to its valuation and possible misuse to bypass offset obligations.

### ToT as a challenge



### Challenges in reaching out to foreign OEMs

Some of the views expressed:

- ▶ The government's unwritten policy to encourage DPSUs as system integrators
- ▶ Non-disclosure by the government of prospective procurement plans for weapon systems and their details
- ▶ Lack of clarity in DPP and offset rules on the process of implementation
- ▶ The OEM dilemma whether the Indian partner will be committed to technology and capital investments.
- ▶ To meet the technology gap between OEMs which have best business practices and their Indian partners.
- ▶ Low costs being the only consideration for OEMs to come to India with no technology transfer
- ▶ Lack of knowledge
  - ▶ Relating to the systems and procedures followed by foreign OEMs in their selection of Indian offset partners
  - ▶ Understanding OEMs' export control procedures and their offset obligations

### Facilitation as an offset partner

While financial, infrastructural and technological assistance were sought by a few, the other areas where assistance was sought included the following:

- ▶ Almost all agreed that the existing licensing process is cumbersome and needs simplification.
- ▶ There is a need for clear identification of areas where offsets will be eligible (from the perspective of MOD/DOFA guidelines) and quick clarification in cases of ambiguity.
- ▶ In cases of dual/common technology, there is a requirement for extension of offsets to other commercial applications, e.g., aerospace.
- ▶ The industry seeks help to identify core competencies in related areas for possible synergy.
- ▶ There is a need for a common offset policy with separate guidelines for different industries such as power, defence and civil aviation.
- ▶ The service industry wants that the issue of eligibility of service companies for offsets should be clarified to all foreign players.



- ▶ There should be empanelment of SMEs and private companies and the provision of a structured forum for foreign vendors to directly interact with empanelled SMEs and private companies, so that they can choose offset partners of their choice.

#### **Other suggestions**

- ▶ Since the offset policy is still evolving, it should be dynamically reviewed to implement any required changes. Further, more flexibility is required in offset banking.
- ▶ The MoD should share some commercial risks with vendors participating in tenders, especially in the case of NCNC trials.
- ▶ The MoD should prioritize and make available a list of its desired technologies to their vendors well in advance, as well as of new projects that will be eligible for offset. RFIs/ RFPs issued, to be published on the MoD website.
- ▶ The current policy discourages Indian companies from being the primary party in a JV bid – RUR must be declared.
- ▶ The government needs to address the industry's concerns quickly so that implementation is not adversely affected.
- ▶ OEMs will commit annual liquidation of offset obligations by the minimum laid down percentage of the total offset value. The minimum percentage should be decided by considering the total offset value, the period of completion as well as the capabilities of Indian industries. Project milestones and offset liquidation plans must be linked to ensure timely completion of offsets. Provision for this need to be made in the offset agreement. This will ensure an even flow of offsets as well as the seller's commitment toward gradual liquidation of the obligation.
- ▶ The industry is of the view that the penalty for an unfulfilled annual obligation should be deducted from the next milestone payment or disqualified for future acquisitions if OEMs fail to honor the minimum offset obligation. This should be done after evaluating the reasons for the failure with best practices and methods.
- ▶ While most organizations had cutting-edge technology to manufacture defence products, they felt the government should support the Indian private sector to acquire defence manufacturing technology.

#### **DOFA**

However, almost all the respondents were of the opinion that there is a need for the government/CII to provide a platform for the industry to interact with OEMs.

- ▶ There is a need for a national offset policy and the establishment of a national offset management body, which is independent and professional and not under the ambit of the MoD.
- ▶ The role of DOFA needs to be redefined and strengthened with the required manpower.
- ▶ Along with the Indian industry, DOFA can identify areas that can become focus areas to meet offset obligations. This will ensure acquisition of cutting-edge technology.
- ▶ DOFA must hold regular interaction with potential OEMs and Indian offset partners to encourage a healthy dialogue and better understanding of the offset policy. Such meetings can be held separately and also jointly with OEMs and Indian industry players.
- ▶ Assistance to SMEs should be extended by DOFA, to help in correctly assessing the content of offset work and its price.

#### **Product support**

The DPP 2008 is oriented toward ordnance factories (OFs) and DPSUs since it mainly focuses on defence equipment manufactured by them. These organizations, which are predominantly engaged in defence production, do not provide product support services for imported/indigenous equipment. No selection/qualification criteria are delineated even for their own products provided to private companies. Product support services through SMEs offsets need to be included in the policy and their qualification criteria laid down.



## Appendix C

Summary of interaction with CEOs

### FDI limit

The FDI issue elicited a mixed response as some SMEs favored the increase to 49%, whereas some felt that the increase in the FDI limit from 26% to 49% is of least importance for SME participation in defence production. The existing FDI policy provides SMEs with effective bargaining power. This, however, may cease if FDI is increased to 49% from the current 26%, since it may result in domination of the industry by global giants.

Those who favored an increase in FDI in the defence sector (to 49%) felt that “after the revolution in the auto Industry, the next would be in the defence industry.” Therefore, there is a need for the government to reconsider and increase the FDI limit to 49% from the current 26%. When foreign companies invest in an SME and have a larger management role, facilitated by a higher FDI limit, they automatically tend to invest more in improving the efficiency of the SME's operation. Therefore, they felt that a higher FDI would help to improve the efficiency and competitiveness of the industry.

### Technology transfer of offset policy

Technology transfer should not be considered to meet offset obligations, since transfer pricing mechanisms are used by foreign companies to gain an advantage. However, one view expressed was that transfer of technology should be considered to meet the offset obligations of OEMs, since without technology transfer, foreign companies may lose interest. In India, pricing of technology is an issue, especially for the defence Industry, which has no standard pricing mechanism. Prices are based on what the buyer is willing to pay. The best mechanism to tackle this situation is competitive bidding for technology. The Kelkar Committee has emphasized that India should pay for the technology it wants.

### Industrial licensing

There should be proper filtering/screening of a company's capabilities through industrial licensing before it is eligible for offset. Currently, there are many companies that want to jump on the bandwagon. Industrial licensing may be the only way of monitoring the quality of companies entering the defence sector. On the other hand, offset is a commercial contract. As such, the buyer will automatically screen the supplier, in any case.

### Uniform registration and database

Simplified uniform registration of vendors and facilitation (single window) would encourage SME participation in defence production. A list of companies acquiring defence licenses can be regularly updated on the DOFA and CII websites as a source of information rather than just the uniform registration of vendors. However, the other perspective was that simplified uniform registration of vendors will not encourage SME participation in defence production since the vendor requirements of various primes may differ. Therefore, every prime has to make its own vendor database and treat it as a vendor development expense.

### Platform for private sector

The Government of India or an industry body such as the CII could provide a platform for the Indian private sector defence industry wherein Indian companies can approach foreign OEMs for partnerships and display their capabilities. The other view was that foreign OEMs know most of the suppliers and there is no need for external facilitation efforts.

### SME capability

It was unanimously agreed that SMEs in India have the capability to participate in defence production. The SME sector is more flexible and spontaneous in its response, has a faster turnaround time, displays more personal commitment, has faster decision-making ability and is easy to teach. SMEs have adequate manpower with partial infrastructure, plants and machinery and financial resources. The capabilities and responses of the industry can be gauged from the development of the auto component industry, which has grown beyond expectations in 13 years. The Indian SME sector is adequately equipped in terms of infrastructure and resources (plants and machinery, finance, skilled manpower, marketing, R&D and training) to be a partner in defence production. However, in the defence Industry, unlike the auto component industry, the gap between placement of the first and the second order can be over five years, making sustenance difficult for SMEs.

### Inhibiting factors

Defence manufacturing in India is a high-risk high-return business. There are no long-term plans or assurances of business. Pre-contract finance is a problem and the biggest inhibiting factor for SMEs is lack of access to financial resources. Further, no institutionalized mechanism is available for funding tier-II and III companies. SMEs should



get grant-in-aid venture capital for product development to bridge the gap between orders and receipt of payment. Stage-wise payments can be made as a project progresses.

The other inhibiting factor for SMEs is cancellation of RFPs. RFP cancellation should be explained by the Defence Ministry, which will help to identify companies responsible for such cancellations. Vendor meets and discussions on RFPs should be more detailed. Lack of transparency also restrains SME participation to a certain extent.

Despite being equipped in terms of infrastructure and resources to some extent, there are factors such as input costs, government facilitation and transparency, which hamper the participation of Indian SMEs in defence production.

#### **Facilitating aspects of SMEs**

SMEs are usually owner-driven companies and survive on niche technologies. They present the real competition to PSUs and MNCs. Large companies will approach SMEs only if they see value being delivered by them. For any project, there should be active involvement of SMEs right from the conceptual stage. Although desirable for SMEs, price preferences cannot be implemented or administered. Proper capability assessment of vendors, along with a national vendor base, is also required. Early involvement in projects and hand-holding of vendors by the main integrators will to some extent contribute to the effective participation of SMEs in defence production.

Facilitating financial assistance to SMEs is of prime importance. If that is done, everything else will fall into place.

A level playing field with PSUs is also essential. There are cases where the earnest money to be paid by a private player or SME is much higher than what a PSU has to pay. These anomalies should be removed even before price preferences. Financial assistance is a very important factor, followed by price preference, hand-holding of vendors by the main integrators, conceptual stage involvement, capability assessment of vendors, a national vendor base and a uniform registration process.

#### **Benefits for SMEs in recent policy initiatives**

The real value addition to the industry will be the emergence of high-tech SME start-ups. In the US, tier-II and III suppliers provide 70-80% of value addition. Joint Ventures and collaborations are primary benefits, followed by technology upgrading/know-how, upgrading of plants and machinery, FDI, subcontracting, co-production, HR development and license production.

#### **Other suggestions**

- ▶ It is necessary to define the strategic objective of the country.
- ▶ SMEs survive because of their innovation and niche capabilities. They are the real competition for PSUs and MNCs. Therefore, PSUs and MNCs are always looking to exploit SMEs. As such, the government should proactively leverage the potential of SMEs.
- ▶ The government should seriously adopt the "Make Indian" policy with minimum value addition of 50% in India.
- ▶ RFPs should be based on competitive bidding and not PSU nomination. PSUs are unable to absorb technology and have become uncompetitive. Presently, each RFP is a process of comparison and not evaluation.
- ▶ A budget allocation of INR1 billion was made for the Technology Development Fund, but there were no disbursements. R&D and infrastructure should be eligible to avail of the fund. There is an urgent need to evaluate the missing link between Venture Capital funds and SMEs.



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# About CII Defence Division

The Confederation of Indian Industry has been actively partnering with the Ministry of Defence, Armed Forces and DRDO in promoting industry participation in defence production. CII Defence Division has been committed to working in the areas of steering policy formulation, defence market development, trade promotion and formulation of international joint ventures and technology transfers.

CII had formed the Defence Division in 1993 to catalyze change in the defence sector by pursuing the Government to liberalize defence production and by initiating the process of partnership with the defence establishments in organizing interactive meetings with end users, i.e. the Armed Forces. Realizing the importance of harnessing the technologies developed within the country, CII has also been a pioneer in organizing interactive sessions with the Defence Research and Development Organization to enlarge the role of private sector in defence R&D. A major partnership with Ministry of Defence has been the organization of the Defexpo India (Asia's largest land and naval systems exhibition) in 1999, 2002, 2004, 2006 & 2008.

CII Defence Division strives to forge industry initiatives to strengthen the Indian defence sector. The objective of this division is to "establish a strong partnership between defence services and industry and enlarge the role and scope of Indian industry in defence production for mutual benefit and enhance national security."

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