



UK INDIA
BUSINESS COUNCIL

Opportunities for U.K. in the Indian aerospace and defence industry

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Abbreviations

A&D	Aerospace and Defence
ADIG	Aerospace and Defence Industry Group
AMCA	Advanced Medium Combat Aircraft
AoN	Acceptance of necessity
BE	Budgeted estimate
CAGR	Cumulative annual growth rate
CAPF	Central Armed Police Force
CRPF	Central Reserved Police Force
DPP	Defence Procurement Procedure
DPSU	Defence Public Sector Undertakings
DRDO	Defence Research and Development Organisation
DSO	Defence and Security Organisation
EODB	Ease of doing business
Eoi	Expression of interest
FDI	Foreign direct investment
GoI	Government of India
HAL	Hindustan Aeronautics Limited
IAF	Indian Air Force
ICG	Indian Coast Guards
LCA	Light Combat Aircraft
MHA	Ministry of Home Affairs
MoD	Ministry of Defence
NOC	No objection certificate
OEM	Original equipment manufacturer
OF	Ordnance Factory
PMU	Project management unit
RE	Revised estimate
RFI	Request for information
RFP	Request for proposal
SIPRI	Stockholm International Peace Research Institute
UAV	Unmanned aerial vehicle
UGV	Unmanned ground vehicle

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Foreword UKIBC

The defence manufacturing industry is an important sector for the Indian economy. And is likely to become even more so with rising national security concerns. Demand for defence equipment has been growing as India prepares to modernise its forces, meet challenges on its two major land borders, and given international pressure to reduce its defence ties with Russia in the wake of the ongoing Russia-Ukraine conflict.

India has been one of the largest importers of arms in the last three decades. And while India's arms imports reduced from USD19,432 million to USD15,356 million in the last five years (according to SIPRI's Trend Indicator Value), India remains one of the world's largest arms importers, accounting for 11 per cent of total global arms imports during 2017–21.

The Government of India is working hard to reduce defence imports and promote exports of defence equipment made by its domestic industry. The draft Defence Production and Export Promotion Policy 2020 set an ambitious goal to achieve a defence manufacturing industry with USD25 billion turnover by 2025, including the export of military hardware worth USD5 billion.

A huge range of initiatives and reforms are underway. For example, a major step to encourage defence manufacturing in India is the allocation of 68 per cent of the capital procurement budget to domestic industry in 2022-23. And to catalyse more innovation in defence technology, 25 per cent of India's defence R&D budget has been earmarked for private industry and start-ups and the Innovations for Defence Excellence (iDEX) platforms aims to create an ecosystem for innovation and technology development in the defence and aerospace sectors.

Other measures include outright prohibition of the import of a wide range of defence equipment, and development of very large platforms including fighter aircraft, helicopters,

tanks and submarines through a Strategic Partnership model.

In association with our knowledge partner KPMG in India, the UK India Business Council (UKIBC), in August 2020, compiled a list of short, medium and long-term opportunities in the Indian Defence and Aerospace industry. For Def Expo 2022, we have jointly updated this report, to help the UK defence industry identify and respond to India's defence opportunities and needs.

We strongly believe the future of UK involvement in this market is co-creation, co-development and making in and with India. Essentially, 'create in India.'

Challenges remain. For example, UKIBC continues to advocate for reform to Offset rules, to indigenous content stipulations, and to FDI rules in defence in India. But nevertheless, we believe there has never been a better time to partner with Indian industry to enter the market for the long-term.

UKIBC and KPMG are ready to support British and Indian firms to achieve this and make a meaningful contribution to UK-India strategic defence, security and aerospace cooperation. Our vision is for the UK to become India's most reliable partner for defence and security technology and solutions.



Richard McCallum

Group Chief Executive Officer, UKIBC

Foreword KPMG in India

The Government of India (GoI), over the past few years, has demonstrated its focus towards reducing its disproportionate dependence on imports for meeting the requirements of the Indian armed forces. Now, as India's security concerns in its immediate neighbourhood remain and as its increased engagement in the global geo-political arena becomes more evident, the pressure of enhancing the capabilities of the armed forces is now greater than ever.

A slew of defence policy reforms and initiatives by the government have been focussed on adoption of modern technology in the defence sector while also improving its domestic manufacturing capability. India aspires to develop a defence manufacturing ecosystem worth USD25 billion by 2025 and exporting USD five billion of defence equipment annually by the same timeframe¹. GoI's crucial initiatives such as 'Make in India' and 'Atmanirbhar Bharat' consider defence as a key sector for achieving the target. The defence manufacturing capabilities in the country are evolving, and the need to collaborate with global defence suppliers is now more pertinent than ever. India offers immense growth opportunities for foreign players through partnerships and in this paper,

we intend to highlight key opportunities in the Indian A&D sector while also providing insights on the regulatory and policy front.

We would like to thank UKIBC for giving us this opportunity to collaborate with them for circulation of this document to their esteemed members.



Abhishek Verma

Partner, Aerospace and Defence
KPMG in India

1. Defence Production and Export Promotion Policy 2020, Ministry of Defence, Government of India



01

Defence manufacturing in India - a Sunrise sector: 2022 perspective

Road to indigenisation¹

India's defence industrialisation started with the first Industrial Policy Resolution adopted in 1948 when 18 Ordnance Factories (OF) were formed as the core of India's state-led defence industry. The OFs were supported by a rudimentary Research and Development (R&D) operation, which in 1958 became the Defence Research and Development Organisation (DRDO). Also, an aircraft plant, Hindustan Aircraft Factory (now known as Hindustan Aeronautics Limited (HAL)), was set up in Bengaluru in 1940 with the objective of promoting the aviation industry in India.

The events of the 1960s, particularly the 1962 war with China and the India-Pakistan war of 1965, brought about a major change in India's defence policy. Concurrently India's defence budget as percentage of GDP and its approach towards arms procurement policy moved towards indigenous defence production. Through the 1980s, the Government continued to increase spending on R&D to enable DRDO to undertake projects. However, indigenous efforts were not adequate to meet the growing requirements of the armed forces. This forced

the government to look for alternative equipment from external sources. With the objective of building India into a global manufacturing hub, the Make in India initiative was launched in 2014. This initiative spans 25 sectors including defence manufacturing.

The Government's approach to self-reliance in defence manufacturing got an impetus in the early 2000s, when the government permitted 100 per cent participation of the private sector in defence production, with Foreign Direct Investment (FDI) of up to 26 per cent. This did not, however, mean easy access to Indian defence contracts because the MoD's Defence Procurement Procedure (DPP) did not have enough provisions to facilitate private companies' participation in MoD contracts. In order to boost participation of private industry various revisions were carried out wherein in 2016 a host of enabling provisions were introduced as part of the procurement process. The release of a revised Defence Acquisition Procedure (DAP) 2020 by the MoD is the latest step towards widening private sector participation in defence manufacturing sector.

Several initiatives to boost India's defence manufacturing capability have been taken. These include²:

Establishment of two Defence Industrial Corridors (DICs), one each in Uttar Pradesh and Tamil Nadu.



Increasing the FDI limit from 49 per cent to 74 per cent under the automatic route in the defence sector.



Simplification of industrial licensing process with longer validity period.



Release of positive indigenisation lists indicating items which will only be procured from indigenous sources.



Launch of Srijan portal to facilitate indigenisation and reforms in offset policy.



Launch of Innovations for Defence Excellence (IDEX) scheme involving start-ups and MSMEs.



1. KPMG in India's analysis of Indian defence ecosystem, Ministry of Defence literature and press releases

2. Self-Reliance in Defence Production, Press Information Bureau, Government of India, August 2022 India

Indian defence manufacturing ecosystem

Under the Ministry of Defence's (MoD) jurisdiction, the A&D sector has 16 Defence Public Sector Undertakings (DPSUs) that manufacture equipment and platforms for defence and internal security forces.³

These are supported by several Tier-I Original Equipment Manufacturers (OEMs) and Foreign OEMs (FOEMs) that bring together years of experience and excellence to build and completely utilise the A&D ecosystem that exists in India.⁴

The base of the Indian A&D value chain comprises of nearly 12,000 Micro, Small and Medium Enterprises (MSMEs) that provide platform critical goods and services to the Tier I/ II entities and enterprises. The MSME supply chain has grown by 58 per cent over the past four years and will continue to grow proportional to the domestic growth drivers and policies instituted by the Government⁵.



Sector outlook

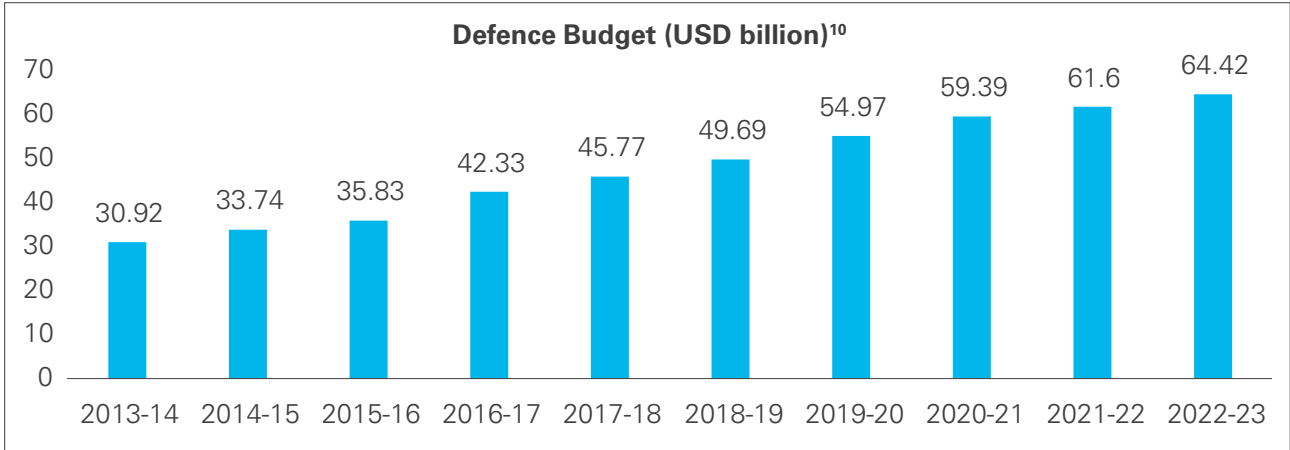
Robust growth potential of the industry is attracting global OEMs into the A&D sector to setup facilities in India. The Ministry of Defence (MoD) has set a target of doubling the defence production to USD26 billion by FY25 from USD12 billion in FY20⁷. Defence manufacturing has been identified as one of the prominent sectors under the 'Make in India' initiative to

realise USD05 trillion economy by 2024⁸. In order to achieve the target annual growth rate of ~15 per cent in defence production, MoD is focusing on increasing private sector participation and defence exports. The focus is not only on the expansion of the existing defence market but also looking at arenas to strengthen indigenous manufacturing.

3. Department of defence production, Ministry of Defence, Government of India website
4. KPMG in India's analysis of Indian defence ecosystem
5. KPMG in India's analysis of Government of India policies
6. Department of Defence Production website, Ministry of Defence, Government of India
7. Defence Production and Export Promotion Policy (DPEPP), Department of defence production, Ministry of Defence, Government of India website
8. Make in India, Government of India website

Defence budget

India's defence budget has increased at a Compounded Annual Growth Rate (CAGR) of 7.62 per cent over the past 10 years⁹. This increased defence expenditure indicates a trend towards spending for modernising the defence forces.



Key figures from the Indian defence budget FY22-23¹¹

- The army spends a major portion of its budget on revenue expenditure. Split between the capital expenditure and revenue expenditure hovers between 17 per cent - 83 per cent to 20 per cent - 80 per cent.
- Indian Navy spends a much larger proportion of its annual budget on capital expenditure. (Approximately 55 per cent to 65 per cent).
- Like the Navy, the Air force too spends a much larger proportion of its annual budget on capital expenditure than the Army approximately 60 to 65 per cent.
- Corporatisation of OFBs has resulted in a reduction of about USD0.46 billion (INR 3,780 crores) in the revenue expenditure of MoD
- 68 per cent capital budget allocations are for domestic industry as part of the Atmanirbhar Bharat initiative in defence.
- In the Union Budget 2022, ~ USD64.42 billion (INR 525,167 crores) is allocated towards the total defence budget for FY 22-23.
- The overall capital outlay for research and development has increased by about (21.3 per cent over RE 2021).



9. Annual expenditure budget document, Ministry of Finance, Government of India

10. Union Budget documents, Ministry of Finance, Government of India

11. KPMG in India's analysis of past union budgets of Government of India

Defence procurement

Capital procurement¹²

DAP 2020 is a compendium of all capital procurement procedures and routes that the military and related entities must abide by. It has detailed chapters on 'Make', 'Design and Development' and 'Strategic Partnerships' that are tailored to focus on the ultimate objective of self-reliance in the A&D sector. Seen as a significant improvement over its predecessor - Defence Procurement Procedure 2016 (DPP 2016), DAP 2020 was envisaged to ensure that capital acquisition of equipment, platforms and systems meet certain criteria that ensure reliability and high performance. The capital acquisition schemes are broadly classified into the following procurement categories.

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Make			Leasing		D&D/Innovation	
Make I D&D of equipment, platforms or upgrades (MoD to fund upto 70 per cent of prototype development cost)	Make II Prototype development of equipment by private industry/ platform or upgrades primarily for import substitution/ innovative solutions Make I D&D of equipment, platforms or upgrades (MoD to fund upto 70 per cent of prototype development cost)	Make III Subsystems/ sub-assembly/ components etc. not IDD but manufacture in India as import substitution for product support of equipment in inventory	Lease (Indian) Lessor is the Indian vendor	Lease (Global) Lessor is the foreign vendor	iDex Ecosystem to foster innovation & tech in A&D sector by engaging entrepreneurs, startups, MSMEs	Open Competition To promote out-of-the-box thinking by encouraging entrepreneurs, innovators
Buy				Buy and make with ToT		
Buy Indian (IDDM) Purchase from Indian vendors.	Buy Indian Purchase from Indian vendors only	Buy (Global Manufacture in India) For outright purchase from foreign vendor	Buy Global For outright purchase globally	Buy Purchase from a foreign vendor followed by licensed production/indigenous manufacture	Make Indigenous production in a phased manner involving ToT	

12. Defence Acquisition Policy 2020, Ministry of Defence, Government of India

13. Defence Acquisition Policy 2020, Ministry of Defence, Government of India

The 'Make' category¹⁴

To nurture the domestic ecosystem in the A&D sector, DAP 2020 has laid down the 'Make' category to foster greater involvement of the private sector.

Make I	Make II	Make III
(Government funded)	(Industry funded)	(Indigenously manufactured)
Under Make I, projects that involve the design and development of equipment, systems, major platforms, or upgrades to such platforms are eligible for a funding of upto 70 per cent of the prototype development cost or maximum INR 250 crores per Development Agency (DA). As deemed fit by MoD, the upper limit of the funding may vary on a case-to-case basis.	Indian vendors that design and develop innovative solutions for which no government funding is sanctioned fall under the Make II category. Make II primarily targets equipment/system/platforms or their upgrades or their sub-systems/sub-assembly/ assemblies/components/ materials /ammunition/ software that are identified primarily for import substitution.	Equipment for import substitution for product support of weapon systems/equipment held in inventory by the Services fall under the Make III category. This equipment may not be designed/developed indigenously but may be manufactured in India by means of collaboration or ToT with foreign OEMs. The Indian vendors may also enter into a JV with the foreign OEM.

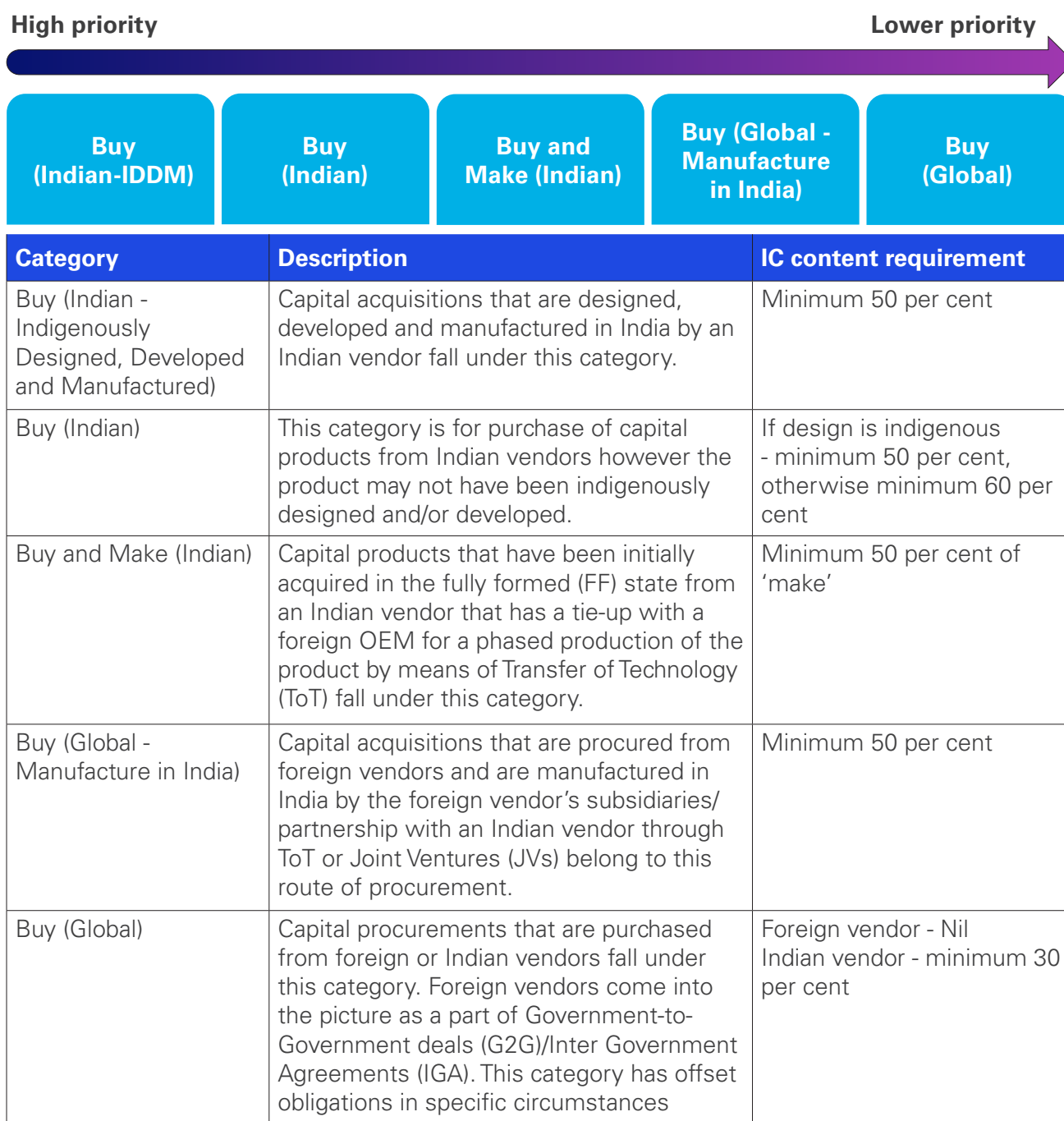


14. Defence Acquisition Policy 2020, Ministry of Defence, Government of India

The 'Buy' category¹⁵

This category defines equipment that is purchased from various global and Indian suppliers. To aid Indian manufacturers of components, sub-systems and equipment manufacturers to establish themselves in the global defence supply chain a requirement for Indigenous Content (IC) has been defined.

DAP 2020 has specified a priority order for the procurement of capital equipment and platforms to achieve the Atmanirbhar Bharat goal. This priority is illustrated in the following graphic:

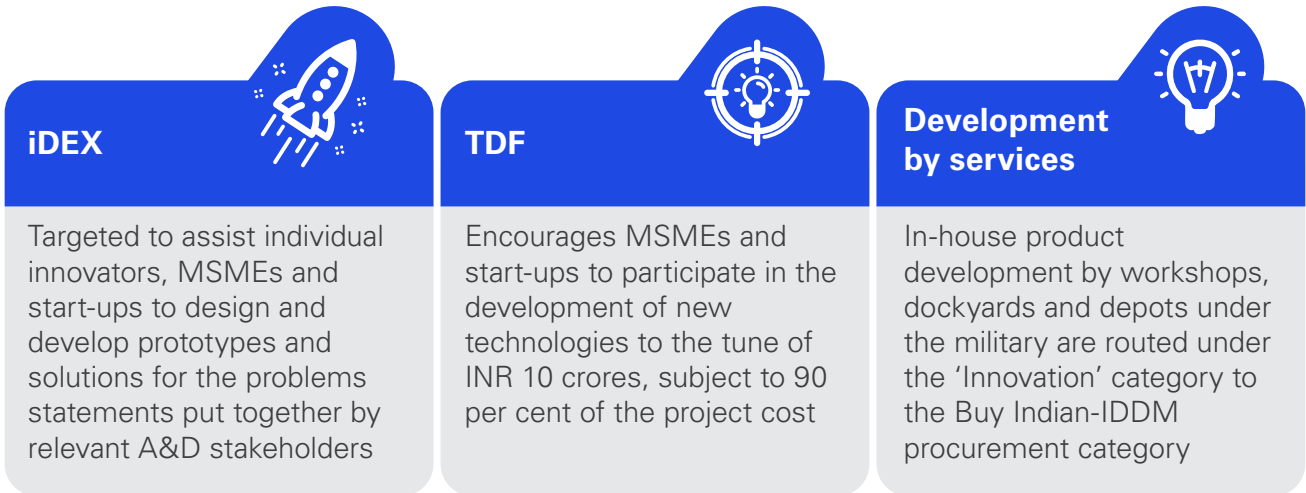


15. Defence Acquisition Policy 2020, Ministry of Defence, Government of India

The 'Innovation' category¹⁶

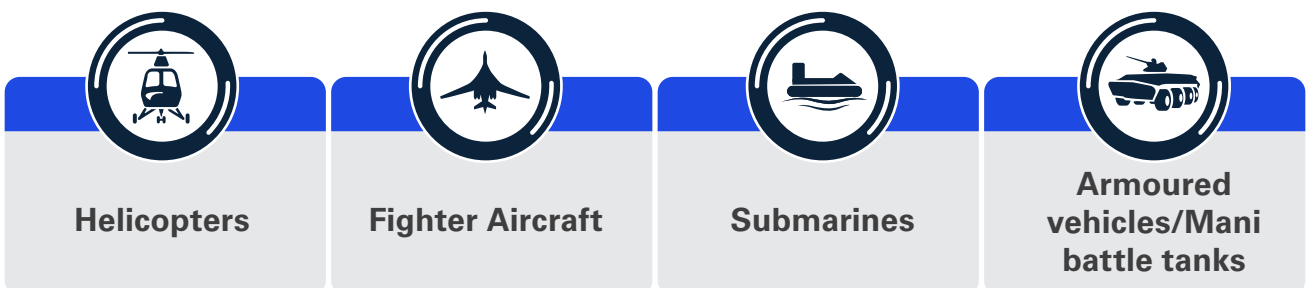
Recognising the true potential of the Indian industry, the Ministry of Defence (MoD) has set up Innovations for Defence Excellence (iDEX) to provide funding to projects that may indigenise existing equipment and platforms. The

Technology Development Fund (TDF) under DRDO is another such instrument that provides capital to the domestic players for the design and development of prototypes that may be productised for active military use.



Strategic partnership

To build an ecosystem comprising of development agencies and specific technology-oriented vendors, MoD has devised the strategic partnership model to develop the following category of platforms¹⁷:



This model covers end-to-end product development and maintenance, covering all bases from manufacturing to product life-cycle support. The model depends on two types of agencies: a System Integrator (SI) which is an Indian entity that is expected to manufacture the platform in India and a technology partner which is a foreign entity and is expected to partner with the SI to provide the requisite technology. The strategic partners will be selected by MoD after diligent scrutiny of Indian OEMs and their foreign partners.

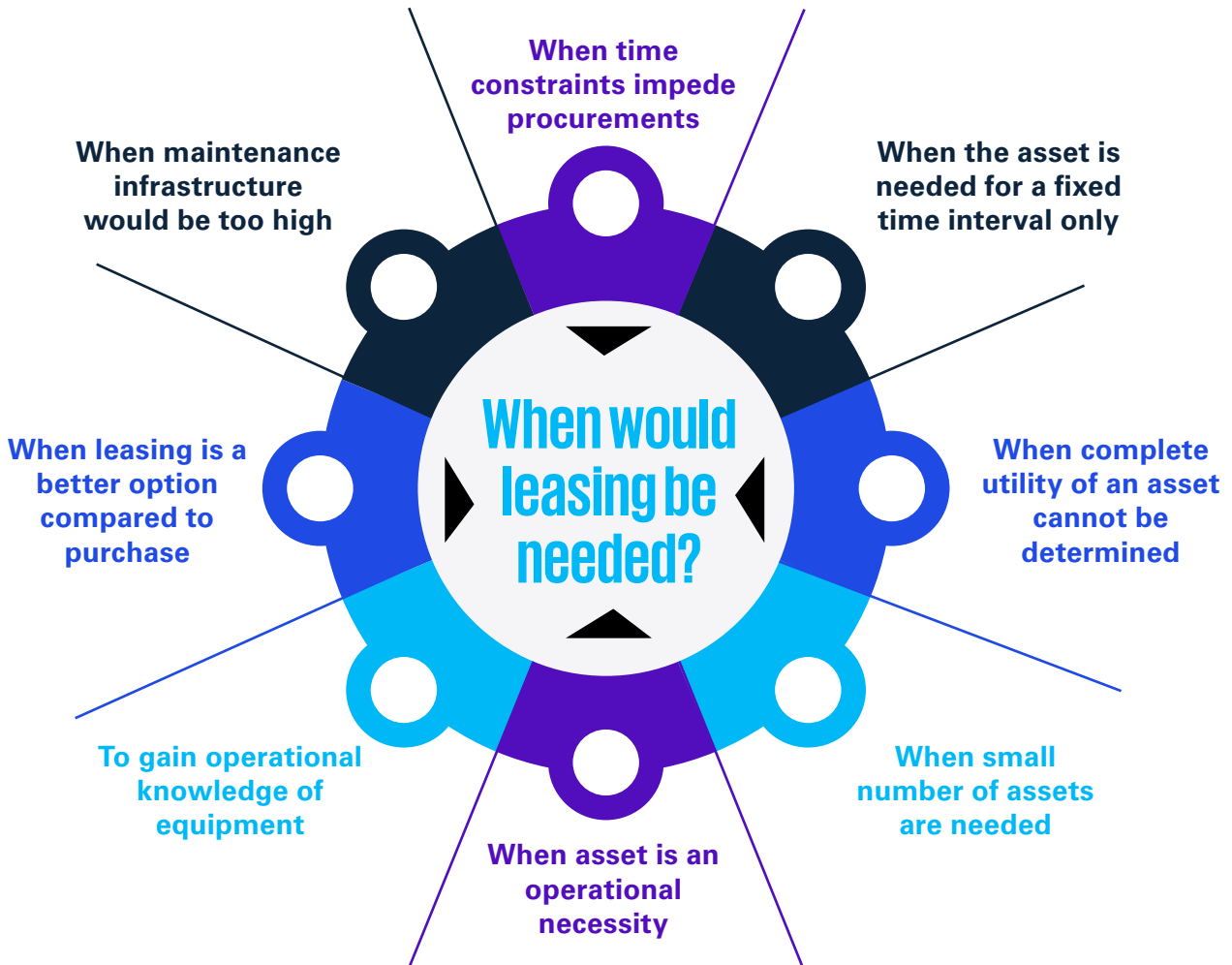
The strategic partners are responsible for identifying and setting up a tiered local industry that would contribute to the regional value chain which in turn will nurture the domestic industry. This supply chain would comprise of micro to large enterprises including R&D organisations and other firms, reliant on each other for operations. A roadmap to envisage these aspects will be drafted by the strategic partner and submitted to MoD. This model is an example of 'policy in action' to develop the self-reliant domestic A&D supply chain.

16. Defence Acquisition Policy 2020, Ministry of Defence, Government of India

17. MakeinIndiadefence website, Ministry of Defence, Government of India

Leasing

This is a newly introduced category in DAP 2020. Chapter-IX of DAP 2020 lays down the rules and regulations concerning the use of a lease contract. This category has been introduced keeping in mind the following use cases:



Other Capital Procurement Procedures (OCPP)

Chapter-X of DAP 2020 describes OCPP procurement of items and services such as refit, overhaul, replacements, and upgrades of existing assets to improve their utility while abiding by the terms defined by the General Financial Rules 2017. Overhauls, refits, replacements, and upgrades of capital nature will be classified under OCPP.

Revenue procurement

The Defence Procurement Manual 2009 is currently the guiding document that regulates revenue procurements. It has had minor revisions over the years since it came into effect in 2009.

MoD has published the draft DPM 2021 focusing on minimising procurement delays and tilting the revenue procurement regime towards a digital marketplace that would prefer business routes with the local domestic industry. This draft, however, does not account for the

Ordnance Factory Board (OFB) corporatisation that took place subsequent to its publication.

As per DPM 2021, revenue procurements made by the OFB and DRDO are in accordance with their respective procurement manuals and do not adhere to DPM 2021. Entitled rations as well as revenue purchase made during emergencies will follow the guidelines laid down by MoD. The channel of procurement identified by DPM 2021 are as follows:

Category	Description
Revenue procurement	Procurement of items and equipment, including replacement equipment assemblies/sub-assemblies and components, to maintain and operate already sanctioned assets in the service.
Capital Booking Revenue Procedure (CBRP)	MoD (Fin) from time-to-time exempts procurement of certain items of capital nature following the provisions of DAP and instead allow their procurement following the provisions of DPM
Indigenous procurement	Procurement from indigenous sources is called indigenous procurement.
Foreign procurement (Import)	For such defence equipment and assets, which are of foreign origin, items required to maintain and operate equipment may also need to be procured from suppliers abroad.
Central procurement	Central Procurement is undertaken against indents resulting from planned provisioning process like the Annual Provision Review, refit planning, obsolescence planning and planned routines
Local procurement	To meet the short-term, ad-hoc or urgent requirements of units/ establishments when supplies are not available through the central provisioning agency.
GeM procurement	The procurement of goods and services by departments or organisations will be mandatory for goods or services available on Government e Market Space (GeMS).
Rate contract	Goods for which central procurement agency or MoD/Service HQs /Command HQ/depots etc. has rate contracts can be procured directly by using such rate contracts.

Key policies to promote indigenisation

In line with the vision of Atmanirbhar Bharat, various policies have been formulated. A few key aspects of policy are:

Budget allocation to domestic industry

- The Government has reserved 68 per cent of the capital procurement budget for the domestic industry. Recognising the importance of developing cutting edge technology to safeguard the nation's interests against threats and adversaries during geopolitical conflicts, the Government has reserved 25 per cent of the A&D R&D budget for start-ups and academia¹⁸.

Indigenisation list

- Another major step is the announcement of positive indigenisation lists, MoD has announced three such

lists consisting of 780 defence platforms, systems and components. It is pertinent to note that about 106 items have been indigenously developed while another 204 items are in various stages of development. Further, among the items under development, about 46 items so far have been accorded under the Make II category and three platforms namely the "Light, Medium and Heavy Combat Armoured and/or Mine Protected Vehicles for Infantry", "Light Weight Tanks", and the "Land Based Tactical Communication System" are to be manufactured under the Make I category.

The MoD has also identified the following measures on account of Business Process Re-engineering (BPR) in defence capital procurements¹⁹.

- Policy direction indicating import of defence equipment only as an exception.
- Simplifying the mechanism for computation of IC.
- Need for counter guarantee by Indian banks for foreign bank guarantee.
- Simplifying the process for scaling and quantity vetting in Make I and Make II cases.
- Notification of a trial directive timeline.
- Revision in AoN according authority for Other Capital Procurement Procedure (OCPP) cases.
- Allowing splitting of quantities among multiple vendors at SoC stage.
- Simplification of procedure for acquisition through Make-II.

Foreign Direct Investment (FDI) in the defence sector

Liberalisation of the defence industrial licensing regime (Press note 1/2019) reducing license requirement for only platform level manufacturing and relaxation in FDI makes it possible for foreign owned and controlled companies to set up manufacturing establishments in India without having to collaborate with an Indian partner. As per the new policy, the increased FDI limit can go beyond 74 per cent wherever it is likely to result

in access to modern technology or for other reasons that should be recorded. This increased limit will be applicable subject to industrial license under the Industries (Development & Regulation) Act, 1951, and manufacturing of small arms and ammunition under the Arms Act, 1959. The key aspects of the revised FDI policy for the A&D sector are described in the table on the next page²⁰:

19. Union Budget 2022-2023, Finance Minister, Government of India

19. KPMG in India's analysis and research of Ministry of Defence directives.

20. Press note no 4, FDI Policy section, Department for Promotion of Industry and Internal Trade, Ministry of Commerce & Industry, Government of India

Condition	Regulation
For seeking new IL	FDI up to 74 per cent under automatic route shall be permitted for companies seeking new industrial licenses.
Clause of on ground scrutiny	Foreign investments in the defence sector shall be subject to scrutiny on grounds of national security and Government reserves the right to review any foreign investment in the defence sector that affects or may affect national security.
Companies not seeking IL/or having prior approval	Infusion of fresh foreign investment up to 49 per cent, in a company not seeking IL or which already has Government approval for FDI in defence, shall require mandatory submission of a declaration with the MoD in case change in equity/shareholding pattern or transfer of stake by existing investor to new foreign investor for FDI up to 49 per cent, within 30 days of such change. Proposals for raising FDI beyond 49 per cent from such companies will require Government approval.
Screening of applications	License applications will be considered by the Department for Promotion of Industry and Internal Trade, Ministry of Commerce & Industry, in consultation with MoD and Ministry of External Affairs (MEA). Foreign investment in the sector is subject to security clearance by the MHA and as per guidelines of the MoD.
Investor shall be self-sufficient	Investee company should be structured to be self-sufficient in the areas of product design and development. The investee/joint venture company along with the manufacturing facility, should also have maintenance and life cycle support facility of the product being manufactured in India.

The key takeaways of FDI policy in the A&D sector are as follows:

Activity	FDI permitted	Approval required	Conditions
Not requiring IL	100 per cent	No	NA
Requiring IL	Up to 74 per cent	Automatic route	Security clearance. Investee company should be self-sufficient in the area of product design and development. Government reserves right to review any FDI in the defence sector.
Requiring IL	Beyond 74 per cent up to 100 per cent	Government approval route	FDI beyond 74 per cent, shall be permitted under government route on a case-to-case basis, wherever it is likely to result in access to modern technology.



02

Opportunities - Avenues to look for



Indian Army

The Army has a long list of equipment that is of foreign origin and has become obsolete. In order keep military equipment and platforms battle ready, the army is focusing on both indigenous capability and various procurement strategies to enhance its defence capabilities. Major procurement programmes for the army at various stages of completion are stated below:



S No	Program name	Quantity	Programme value (USD million)	Current status
1.	Future Ready Combat Vehicle (FRCV) ¹	1,770	10,800	Under SPM, development of Quality Requirement (QR) is under process.
2.	Futuristic Infantry Combat Vehicle (FICV) ²	2,610	8,000	A fresh RFI issued in June 2021
3.	155mm mounted gun system ³	814	1,900	Seeking fresh AoN for acquisition
4.	Auxiliary Power Unit (APU) ⁴	3,257	177	AoN accorded on 21 Oct 2019. Eol issued on 29 Jan 2020.
5.	125mm APFSDS Ammunition for MBTs ⁵	85,000	307	AoN accorded on 13 Sept 2019. Eol stage.
6.	7.62x51mm Light Machine Guns (LMG) ⁶	16,000	117	Contract under Fast track process from Israel
7.	3rd Generation Anti-Tank Guided Missile (ATGM)	101 launchers, & 2,330 missiles	-	EOI issued in Feb 2020
8.	Electronic fuses tech for rockets	20,000	-	Feasibility study
9.	GPS/GIS based minefield recording system	3,680	-	Being fielded for AoN.

Apart from these, the army is also looking forward to procuring sniper rifles, carbines and ammunition in the arms and ammunition category.

1. KPMG in India's analysis of RFI released by Ministry of Defence
2. RFI released by Directorate General of Armoured Corps, General Staff Branch Ministry of Defence (Army), Defence Headquarters
3. Field Artillery Rationalisation Plan (FARP)
4. Technology perspective and Capability roadmap 2018
5. Technology perspective and Capability roadmap 2018
6. Press information Bureau of India

Indian Navy

The Indian Navy (IN) is modernising its fleet rapidly. The 15-year indigenisation plan (2015-30) aims to increase the navy's fleet size from existing 150 to 200 by 2027⁷. Presently, the Navy has 50 ships and submarines under construction in Indian shipyards, both public and private⁸. Major programmes under various stages of procurement stage are mentioned below:



S No	Program name	Quantity	Programme value (USD million)	Current status
1.	Indian Aircraft Carrier – 2 (IAC2) ⁹	01	20,000	In discussion phase, might be stalled for 2 years due to budgetary issues
2.	Multi-Role Carrier-Borne Fighter (MRCBF) Aircraft ¹⁰	57	10,000	Request for Information (RFI) issued in Jan 2017
3.	Naval Multi-Role Helicopters (NMRH) ¹¹	123	7,200	RFI issued in 2017, to be built under Strategic Partnership Model (SPM)
4.	Project 75I Submarine ¹²	06	7,000	To be built under SPM - 2 Indian and 5 foreign companies shortlisted
5.	Light Maritime Utility Helicopter ("Naval Utility Helicopter-NUH) ¹³	111	2,800	Defence Acquisition Council (DAC) approved acquisition of NUH
6.	Landing platform Docks (LPD) ¹⁴	04	2,667	RFI was issued in August 2021
7.	Next Generation Missile Vessel (NGMVs) ¹⁵	06	1,880	Cochin Shipyard Limited (CSL) won the bid in Feb 2021
8.	Naval Shipborne Unmanned Aerial System (NSUAS) ¹⁵	15	-	RFI issued in Feb 2020, RFP expected to issue by Dec 2020
9.	Next generation guided missile destroyer ¹⁵ (NGD)	5 -10	-	Planned
10.	Next generation Frigate (NGF) ¹⁵	5 -10	-	Planned
11.	Next Generation Corvettes (NGC) ¹⁵	7	-	Planned
12.	Mine Counter Measure vessels (MCMVs) ¹⁵	NA	-	Planned
13.	Next generation offshore patrol vessels (NGOPV) ¹⁵	6	605	Approval from DAC received

7. Indian Naval Indigenisation plan (2015-2030), Indian Navy, Ministry of Defence

8. KPMG in India's analysis of orderbooks of public sector shipyards and press releases of Government of India

9. KPMG in India's analysis of Government press releases and Indian navy requirements

10. Request for Information – Directorate of Naval Air Staff Integrated Headquarters Ministry of Defence (Navy) – 2017

11. Request for Information – Directorate of Naval Air Staff Integrated Headquarters Ministry of Defence (Navy) – 2017

12. Press information Bureau of India – Ministry of Defence 20 July 2021

13. Press information Bureau of India – Ministry of Defence 29 November 2021

14. Request for Information – Directorate of Naval Air Staff Integrated Headquarters Ministry of Defence (Navy) – 2021

15. Technology perspective and capabilities roadmap - 2018

Indian Air Force

The Indian Air Force (IAF), in its 'Indigenisation Roadmap Indian Air Force (2016-2025)', highlighted acquisition projects worth USD33 billion (INR2.5 lakh crore)¹⁶. The major programmes under various stages of procurement stage are mentioned below:



S No	Program name	Quantity	Programme value (USD million)	Current status
1.	LCA Mk-2(Medium Weight Fighter) ¹⁷	216	-	Preliminary Design Review (PDR) approved on 20 March 2020
2.	Twin engine deck-based fighter (TEDBF) /Omni role Combat aircraft (ORCA) ¹⁸	NA	-	Cleared by Defence Minister on 22 May 2020 at ADA's Annual Board Meeting
3.	Advanced Multirole Combat Aircraft (AMCA) ¹⁹	126	-	Planned to enter service in 2035 to replace Sukhoi 30 MKI aircraft
4.	Medium weight multi role fighter aircraft ²⁰	114	15,000 (estimated)	RFI issued in 2018
5.	Medium-lift transport aircraft ²¹	56	1,600	C 295 platform selected; contract awarded.
6.	Infrared Imaging Search & Track System (IRST) ²²	100	247	Design and development phase.
7.	Foldable Fiberglass Mat (FFM) for runway repair ²²	122 sets/year	26	EoI response received
8.	Unmanned Combat Arial Vehicles (UCAVs) ²²	-	-	CATS Warrior program underway with HAL & NAL, expected by 2024
9.	Light Combat Helicopter (LCH) ²²	-	-	Deliveries started by HAL, additional orders anticipated.
10.	Medium Altitude Long Endurance (MALE) UAV ²²	15	-	RFI issued in 2016

16. Indigenisation Roadmap Indian Air Force (2016-2025), Ministry of Defence

17. Press Information Bureau – 20 Aug 2021

18. KPMG in India's analysis of Indian Navy aircraft requirements and released RFIs

19. KPMG in India's analysis of DRDO press releases and Indian air force requirements

20. Press Information Bureau - 13 AUG 2018

21. Press information Bureau - 08 SEP 2021

22. Technology perspective and capabilities roadmap - 2018

Indian Coast Guard

The following are the major procurement programmes in the pipeline of ICG²³



S No	Program name	Quantity	Programme value (USD million)	Current status
1.	Fast Patrol Vessel	8	290	RFP issued in Jul 2019
2.	Air Cushion Vehicles	12		
3.	Ammunition Barges	8		

23. KPMG in India's analysis of the Indian Coast Guard requirements and fleet replacement schedules





03

Opportunities for U.K. Industry

On the recent visit of the former U.K. prime Minister Boris Johnson to India in April 2022, several key areas of co-operation were acknowledged by the two country representatives and the same was released as part of a joint press note which¹ speaks about the vision of the co-operation of the two countries up to 2030. The key Aerospace and Defence related points are as highlighted below:

- Intensifying cooperation as trusted partners under the India-U.K. Defence and International Security Partnership framework.
- Finalisation of the Letter of Arrangement (LoA) between the U.K.'s Defence Science & Technology Laboratory (DSTL) and India's Defence Research & Development Organisation (DRDO).
- The LoA will endure delivery of advanced security capabilities through joint-research, co-design, co-development and joint production of defence technology and systems, particularly in key and emerging military technologies.
- Establishment of a Joint Working Group (JWG) on India-U.K. Electric Propulsion Capability Partnership with the goal of fostering military and industrial collaboration in maritime Electric Propulsion systems.
- Cooperation in key areas of strategic collaboration to include, Modern Fighter Aircraft (MFA) and Jet Engine Advanced Core Technology
- Increased engagements on critical and emerging domains of defence including space, Artificial Intelligence (AI) and cyber security.
- U.K. announcement of an 'Open General Export Licence' (OGEL) to facilitate technology engagement with India.
- Open General Export Licences (OGELs) are issued by the Export Control Joint Unit (ECJU), as part of Department for International Trade, U.K. and permit export of controlled dual-use or military goods, software and technology overseas. This would certainly ease the process for U.K. companies to export niche technologies to India.
- Open opportunity for India to participate in the U.K.'s aviation and naval shipbuilding programmes
- Setting up of robust defence industrial collaboration for manufacturing of defence equipment, systems, spare parts, components, aggregates and other related products and key capabilities, under the Make-in-India program through co-development, indigenisation, transfer of technology and setting up of joint ventures for meeting the needs of Indian Armed Forces and other countries.
- Work bilaterally with key partner countries to facilitate highest level access to technology to Indian industry
- Finalisation of Logistics and Training MoUs to deepen understanding and trust and enable further collaboration and cooperation.
- Expand cooperation in the maritime domain and early conclusion of the Maritime Information Exchange Arrangement on dark and grey shipping.
- An enhanced India-U.K. cyber security partnership to tackle shared cyber threats as also to deepen cooperation across cyber governance, deterrence and strengthen cyber resilience
- Convening of the Defence Ministerial Dialogue this year (2022), to ensure all the necessary framework agreements are in place.
- Constituting a sub-group on countering extremism under the Joint Working Group on Counterterrorism (JWG-CT), to further enhance cooperation with regard to information and intelligence sharing on terror entities and individuals.

1. Joint Statement on India-UK Virtual Summit (Roadmap 2030 for a Comprehensive Strategic partnership) May 04, 2021, Ministry of External Affairs, government of India.

Emerging technologies and areas for cooperation

In view of the potential for collaboration between India and the U.K., the following areas as listed below were identified². Modernisation plans cover a wide spectrum of systems, platforms and technologies. As per the existing trends, it is expected GoI will spend an estimated USD70 billion on defence expenditure in 2022-23, of which about 29 per cent is earmarked for modernisation and capital procurement³.

Network-centric technologies

The COVID-19 pandemic has called out the need to develop actionable intelligence and

deliver it to concerned agencies in near real-time to mitigate situations affecting public health, safety and security – termed as internal security. Nevertheless, there was already an underlying need to establish networks, monitoring systems and command and control systems for internal security. The following are a few potential applications where growth is anticipated and can be targeted by U.K. companies on account of their technical acumen and leadership position:

Application	Indian scenario	U.K. advantage
Mobile/remote surveillance equipment; e.g. tactical UAVs and UGVs	<ul style="list-style-type: none"> • High demand across users for UAV/UGV based remote surveillance. • Indian UAV market is at a nascent stage with companies which are generally a mix of small-scale technology start-ups and large corporations with newly established UAV manufacturing capabilities. 	<ul style="list-style-type: none"> • U.K. companies have design and manufacture capabilities for wide range UAVs capable of custom- building UAV/UGV platforms for a broad array of military and commercial applications.
Sensors, scanners and detection equipment; such as X-ray, explosive detection, CT scanners, biometric security, authentication systems, etc.	<ul style="list-style-type: none"> • The manufacturing capability in India is highly varied, ranging from basic biometric sensors to high-end Electro- Optic (EO)/Infrared (IR) sensors. • This market is relatively new to India but is picking up pace. 	<ul style="list-style-type: none"> • U.K. companies are providing X-ray screening and baggage scanning solutions to major airports in India⁴
Command, Control and Communication (C3) equipment <ul style="list-style-type: none"> • Software applications for integrating information • Hardware equipment for communication purposes 	<ul style="list-style-type: none"> • Capability for manufacturing the low-end hardware is well developed in India, however, capabilities for designing and developing high end complex software solutions are limited 	<ul style="list-style-type: none"> • U.K. suppliers have demonstrated capability of producing complex software as well as the hardware such as surface/arial radars, ELINT platforms, ship/ submarine-based battle management systems etc. to serve the needs of security forces.

2. KPMG in India analysis and research of U.K. and Indian defence companies

3. Union budget 2022-2023, Ministry of Finance, Government of India.

4. KPMG in India's research and analysis of press releases and government tenders

Military materials

A large portion (up to 90 per cent of the processed and semi- finished raw materials such as ferrous and non-ferrous alloys, composites and ceramics) required for indigenously manufactured platforms are estimated to be imported⁵. Key material groups with significant requirements, and their major applications, are as listed in the following table:

Condition	Regulation
Aluminium alloys	Fuselage body and bulkheads, wing skins, engine components, fittings.
Special steel alloys	Cabin components, landing gears, aircraft fittings, fasteners, actuators, jet engine shafts, structural tubing, ballistic tolerant components.
Titanium alloys	Aircraft structural items, panels, fastening systems, fan & compressor blades; tank armours in army; rigging equipment, shipboard cooling systems, heat exchangers in navy.
Copper and cupronickel alloys	Aircraft landing gear components, bushings and bearings.
Tungsten Alloys	Armour plates, high-speed armour piercing ordnance; high thermal strength machine parts, rotor/propeller blades and anti-vibration weights, flight control surface components such as rudders, elevators and ailerons.
Composites	Wing skins, forward fuselage, flaperons, rudder, rear pressure bulkhead, keel beam, front fairing, upper fuselage shells, crown and side panels, structural elements of modern helicopters.
Ceramics	Engine and exhaust components, thermal protection shields, structures for ultra-high speed flying objects, lightweight turbine components that require less cooling air such as vanes, nozzles, seals, valves.
Super alloys	Fuel nozzles, washers, bearing races, spacer sleeves, flare castings, engine vanes, bearing supports and other structural parts.

The total demand for raw material spread across the above eight groups for A&S end use in India is approximately USD21 billion¹ (INR17,149 crore). The opportunity in these material groups is sizeable because even though India is estimated to have significant deposits of basic ores such as alumina⁶, iron ore and ilmenite and rutile (Titanium ores)⁷, India currently does not produce the special grade of alloys required for aerospace and defence application.

India is the fourth largest producer of alumina and third largest producer of aluminium, yet India imports 50 per cent of its total aluminium consumption and almost 95 per cent of its aluminium consumption in the A&D sector.

Similarly, India has the third largest deposit for titanium ores but has only recently started producing sponge titanium.

India has developed capabilities in composite components based on glass, carbon and aramid fibres, but apart from glass fibre the manufacturing capabilities for aramid fibres such as Kevlar and high tow strength aerospace grade carbon fibre is absent. With the planned induction of over 550 new combat aircraft and over 300 new helicopters over the next two decades the demand for carbon fibre and prepregs in India is expected to grow tremendously.

5. KPMG in India analysis of the global metals, ceramics, composites and alloys markets

6. Aluminium and Alumina/Indian Minerals Yearbook 2017-Part III/Indian Bureau of Mines, 2017

7. Ilmenite and Rutile/Indian Minerals Yearbook 2017-Part III/Indian Bureau of Mines/2017

Semiconductor fabrication (FAB)

The application and significance of electronics in A&D platforms/systems has increased considerably over the last two decades and is expected to increase further. The objective of self-reliance cannot be met without robust defence electronics manufacturing ecosystem. India has developed capabilities for designing and manufacturing of electronics systems, sub systems and chips, however, there have long been challenges in setting up of FAB units. Currently, the country only has one factory in Chandigarh that makes semiconductor wafers - Semi Conductor Lab (SCL). This facility is capable of producing 8-inch wafers based on CMOS process 180 nm lithography.⁸

Silicon and Gallium Nitride (GaN) based semiconductors have multiple applications in the defence sector. The demand for GaN semiconductors is expected to surge in the coming decade primarily due to its properties and cost-effectiveness.

While India has found early success in research and development of GaN based semiconductors, the U.K. companies have already found commercial breakthrough in GaN foundry technology. A significant opportunity exists in the country, in the field of semiconductor foundry technology, especially for the GaN chips.

8. Semi-Conductor Laboratory (SCL); an autonomous body under Ministry of Electronics & Information Technology (MeitY), Government of India

About us – UKIBC Aerospace and Defence industry group

The UK India Business Council (UKIBC) supports U.K. businesses with the insights, networks, policy advocacy, services, and facilities needed to succeed in India. Working with the U.K. Government and other influential and connected partners, we ensure business interests are conveyed to India's Union and State legislators. The U.K. India Business Council seeks to influence decisions that will make it easier for U.K. businesses to operate in India.

On the 28th of Nov 2019, at an event in Delhi hosted by the High Commissioner Sir Dominic Asquith, the MOD's Permanent Secretary Sir Stephen Lovegrove announced the launch of the U.K. India Business Council's Aerospace and Defence Industry Group. This initiative is the culmination of extensive consultation between the Defence and Security Organisation (DSO), U.K. Defence Solutions Centre (U.K. DSC), ADS, the Department for International Trade (DIT),

industry and UKIBC. Alongside the recently signed Defence Technology and Industrial Capability Cooperation MoU, and ongoing Defence Industry Dialogues, this industry platform is central to the 'Team UK' strategy for engagement and success in India.

The group is chaired by Kishore Jayaraman, President, India and South-Asia Rolls-Royce and the current membership includes Rolls-Royce, BAE Systems, MBDA, Thales U.K., Leonardo, TVS Supply Chain Logistics, Pattonair, Pexa and Cranfield University. It is our intention that membership grows to reflect the full spectrum of British industry participation in the Indian market; including eventually cyber and security to broaden the narrative beyond land, maritime and air and to allow cross sector work. The purpose of the group is to enhance UK-India strategic cooperation, drive improvements and efficiency in India's defence acquisition process and to foster longer term technology and hardware transfers between the UK and India.

UKIBC will support this by:

- Acting as a voice for British business interest in India in these sectors; articulating collective interests to influencers and stakeholders and facilitating interactions between business, politicians and policymakers to generate a shared understanding of businesses' issues.
- Advocating for reform to India's operating and procurement environment, to reduce or remove market access impediments – landscape issues like IPR, offsets, licensing etc.
- Providing intelligence, insight and best practice about dealing with ease of doing business challenges in India.
- Interpreting and analysing policy developments in India.
- Allowing HMG to talk one to many in- market and receive feedback directly from businesses.
- Helping companies meet the right stakeholders within India's procurement landscape and – for smaller firms or supply chains – help them identify appropriate

potential partner firms in India, including through alliances with Indian defence associations.

The formation of this group comes at a time when the UK-India relationship in aerospace and defence is at a critical turning point, with distinct and powerful drivers on both sides. At the same time, the UK Government is looking to deepen its international relationships after leaving the European Union and aims to replicate in defence the trade success it has achieved in other sectors in India recently. HMG is focused on making India a long-term and strategic partner (replacing the traditional, transactional buyer-seller dynamic), with an emphasis on co-development of technology and capability, 'Make in India' and, ultimately 'export from India'. This will involve much more than just hardware – for example, it means focusing on specific areas of technology collaboration and skills-building in India. We welcome your enquiries about joining our Aerospace and Defence Industry Group or questions you have about the Indian Aerospace and Defence market.

Richard McCallum, Group Chief Executive officer, UKIBC India

Dickie is the Group Chief Executive officer, UKIBC India. He is a graduate of the Universities of Durham (History) and Cambridge (International Relations). After University, Dickie joined the John Swire & Sons' management trainee programme based in Hong Kong and Pakistan. From 2005 to 2007 he was Manager Delhi and North India for Cathay Pacific Airways. From 2007 until 2013, Dickie was a founder director of Flying Fox, an innovative adventure tourism company headquartered in Delhi.

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About us – KPMG in India

KPMG entities in India are professional services firm(s). These Indian member firms are affiliated with KPMG International Limited. KPMG was established in India in August 1993. Our professionals leverage the global network of firms, and are conversant with local laws, regulations, markets and competition. KPMG has offices across India in Ahmedabad, Bengaluru, Chandigarh, Chennai, Gurugram,

Hyderabad, Jaipur, Kochi, Kolkata, Mumbai, Noida, Pune, Vadodara and Vijayawada.

KPMG entities in India offer services to national and international clients in India across sectors. We strive to provide rapid, performance-based, industry-focused and technology-enabled services, which reflect a shared knowledge of global and local industries and our experience of the Indian business environment.

Aerospace and Defence practice, KPMG in India

KPMG member firms have a strong global Aerospace and Defence (A&D) practice that serve most of the leading OEMs across the globe. In India, KPMG in India recognises the significant opportunity that this sector presents to our clients. We have a dedicated and specialist team to help clients and to provide complete business-related advisory services – from strategy formulation to

execution. Our professionals have extensive direct industry experience, having worked with the defence services, defence procurement and defence programmes. We have a well-defined and robust approach to support our clients effectively across a spectrum of projects in business performance services, transaction services and tax services including offset advisory.



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