Making ‘Make in India’ work for the Aerospace and Defence Sector

The market opportunities and offset clauses in the government’s defence procurement policies have attracted several global players to set up operations and form joint ventures in India.

Several initiatives have been launched to achieve self-reliance in defence manufacturing and innovation. (Representative image)

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The private sector generated over 20 percent of the Rs 80,000 crore turnover for the aerospace and defence sector in India. Leading business groups like L&T, Tatas, Mahindras, Hindujas and Bharat Forge have made significant investments during the last decade while public enterprises and

organizations including HAL, BEL, BEML and NAL continue to scale up their operations with new programs to meet the government's ambitious aspirations under 'Atmanirbhar Bharat Abhiyan' and 'Make in India' schemes. The market opportunities and offset clauses in the government's defence procurement policies have attracted several global players to set up operations and form joint ventures in India. These include leaders like Airbus, BAE, Boeing, Collins Aerospace, Dassault Aviation, Israel Aerospace Industries, Pilatus, Lockheed Martin, Raytheon, Rafael, Safran and Thales.

Several initiatives have been launched to achieve self-reliance in defence manufacturing and innovation. Defence Industrial Corridors, Positive Indigenisation Lists, DRDO's Technology Development Fund and Innovations for Defence Excellence (iDEX) and Defence Testing Infrastructure Scheme (DTIS) are some of the prominent ones. Local manufacturing of aerospace equipment and aircraft for defence and commercial applications will create significant opportunities for Indian

The path breaking Tata-Airbus joint venture for manufacturing the military transport plane, C295, will result in the full development of a complete industrial ecosystem. Involving all stages of the complete lifecycle of the aircraft, it will comprise manufacturing, assembly, testing, qualification, delivery and maintenance. Over 60 percent of the more than 30,000 detail parts, sub-assemblies, and component assemblies will be manufactured

locally involving over two dozen MSME suppliers in this first-of-its-kind ‘Make in India’ aerospace programme in the private sector. In addition, an indigenously developed electronic warfare (EW) suite developed by BEL and Bharat Dynamics will be deployed on these crafts. However several critical systems such as engines, landing gear, avionics, and the EW suite will continue to be provided by Airbus for integration into the aircraft.

This transition from being assemblers of sub-systems imported from the original equipment manufacturers (OEMs) to creators of equipment, platforms and systems will require a thriving indigenous research, design, development and manufacturing infrastructure driven by a significant scaling up of the research and development ecosystem.

Four connected issues have to be addressed on a war footing to boost the R&D ecosystem. These include development costs, enabling technology transfer, intellectual property rights (IPRs) and testing & trial facilities

Development Costs – To achieve higher levels of indigenization for defence projects, companies need to invest in design, development, prototyping, trials and followed by participation in a competitive bidding process to win a production order. Such comprehensive programs usually span 3-5 years for development, 2-3 years for trials and acceptance which is then followed by a production order. The installation and commissioning of plant and equipment takes another 12-24 months followed by industrialization pre-

production of 12-18 months. Given this long gestation period, companies need to upfront commit significant investments for the development in anticipation of a production order down the road which may or may not even fructify. Other uncertainties include scaling down the production quantity, specification changes or a decision not to go ahead with the production order post-development for strategic reasons by the defence ministry.

The ministry provides up to 70 percent funding for such prototype development subject to a cap of Rs 250 crores. However, this support is inadequate given the size of investments required. In the absence of commitments for a production order, definite timeline or production quantity, these development costs get added to the balance sheet of vendors to be amortized later when the production order is received or to be written off, if the order is not received within a reasonable timeframe.

In a few defence programs, the prototype development is awarded to two different development agencies with the understanding that the production order will be issued to L1:L2 (the two lowest-cost bidders) in a certain proportion. However, L2 is forced to execute the production order for the prototype developed by L1. This makes the entire investment made by L2 in its own prototype development redundant while increasing its execution risks. This process also increases the likelihood of the commercial bid prevailing over the technical superiority of the prototype. Given the financial

risks and uncertainties of the development efforts not translating into a production order, even large industrial groups find it difficult to justify supporting such investments, especially when they participate in multiple such programs simultaneously.

Companies incorporate such risks into the bid pricing which then drives up the cost of the end product. An alternative option for de-risking is by enhancing the funding support from 70% to say 90% without any cap. In addition to reducing the development risk, it will encourage all bidders to price the product more competitively as their development cost will be significantly lower.

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Enabling Technology Transfer

The 'Make in India' programs have been designed to reduce dependence on OEMs by developing domestic capabilities. Local players will be successful only if the OEMs transfer the technologies. However, most OEMs extend transfer of technology (ToT) for low-value items which are not part of the core proprietary technology items. Such skewed technology transfers lead to lifelong dependence on the OEMs. Many times the low-value technology loses its relevance after the production order is completed. Mandating norms for higher levels of technology transfer in

return for access to the booming market, low-cost labour, favourable policies and tax incentives is another way to bring technology. Incentivising OEMs to set up ‘Centers of Excellence’ (CoEs) and ‘R&D Centres’ in India to participate in the ‘Make in India’ Programs can be done by extending the offset clauses. Provided incentives similar to Production Linked Incentives (PLI) will attract domestic players to invest in R&D and build long-term capabilities to address the domestic demand and tap the global markets.

Intellectual Property Rights (IPR)

The IPR, under the ‘Make in India’ programs, belongs to the Government as a fallback mechanism in case the development agency goes into insolvency or encounters project delays. Such an arrangement prevents the development agency from using the IPR’s for product development for adjacent markets on their own or to further develop these products for global markets without the approval of the Government. Alternatives including the option of passing the IPR to the development agency for a royalty or one-time fees for development programs funded by the government, will be very progressive. Of course, such arrangements will exclude IPs with implications for national security.

Testing & Trial Facilities

The testing and trial facilities require significant investments in land, infrastructure and personnel. Given the security restrictions for defence

projects and huge investment requirements, it is financially not feasible for private players. In addition, significant time is lost between trials, sometimes years, waiting to use the public infrastructure with the defence services and the laboratories. Alternatively, significant costs have to be incurred to carry out these trials abroad. Incentivising investments and expanding the capacities will significantly lower delivery timelines while reducing the cost of the end product.

Establishing the envisaged next-generation indigenous domestic defence eco-system will necessitate a robust and state-of-the-art testing and trial infrastructure. On account of the stringent standards and specifications required in the defence industry, private players venturing into this sector or existing MSMEs face the mammoth challenge of catering to the testing requirements of these products.

Opening up the test facilities in defence laboratories and public sector organizations to the start-ups and MSMEs in equipment development and manufacturing under the Defence Testing Infrastructure Scheme (DTIS) is the first right step. Such progressive initiatives will boost investments in the indigenous design and production industry. Setting up an independent nodal umbrella body for testing, trial and certification requirements of defence systems will improve access to existing facilities while reducing the need for investments to recreate the capital-intensive infrastructure.

Addressing these issues will help us switch to a ‘Make by India’ pathway requiring our research and development to match and then exceed global standards. It seems to be a tall order, but not necessarily unachievable, as we will have to start aspiring to conceive in India and not just ‘Make in India’. Centres of Excellence that attract the best engineers, scientists and managers will enable a quantum leap in the number of IPs being created. Developing IPs will be a long and arduous haul yet that positioning will take ‘Make In India’ to the next level of moving from being Tier 1 and Tier 2 suppliers to innovators and new product creators.

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Partnerships between global aerospace firms including Collins Aerospace and Boeing with technical and research institutions including IISc, IIM Bangalore, IITs and RVCE promote collaborative research for technology development. The future pool of researchers will emerge from such partnerships.

While the market for civilian and defence systems in the aerospace sector is being created, it is time to develop a strong research base in India and a robust supply chain for components and sub-systems, most of which were being sourced from abroad. The development of the ecosystem for the aerospace industry will, as an offshoot, accelerate the development of the

supply chain of critical subsystems and components of allied sectors like drones and space.

Public funding for investments in several critical future technologies will be foundational for future innovations both for commercial and military applications: artificial intelligence (AI), robotics, autonomous vehicles, augmented and virtual reality, and blockchains. The line demarcating products designed for commercial versus military purposes is blurring with these new technologies.