



Creating the Equation for Growth

Aerospace Offset Market Opportunity in India

Lucintel Brief

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Lucintel

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Executive Summary

- **Aerospace and Defense offset opportunity in India is a growing market with strong fundamentals:**
 - Aerospace and defense offset market opportunity crossed ~US \$500 M annual value in 2010
 - Market saw growth of 78% (CAGR) during 2005-2010 and is forecast to grow at 11% CAGR during next 5 years
- **Growing involvement of international players in Indian aerospace and defense sector is creating opportunity for domestic companies**
 - OEM's and Prime contractors looking for capable and credible options to fulfill offset obligations
 - International players receive leverage with established relations and experience
 - International players benefit by participating in offset market by partnering with domestic companies for low cost manufacturing for both offset and other opportunities
 - Indian companies benefit from international capabilities and know how
- **Government initiative to build indigenous capability expected to drive the market**
 - Indian Defense budget, estimated at ~US \$32 Bn in 2010, expected to exceed US \$44 Bn in next 5 years
 - Total Offset opportunity is expected to surpass ~US\$12 B over next 10 years



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Overview – Offset Policy

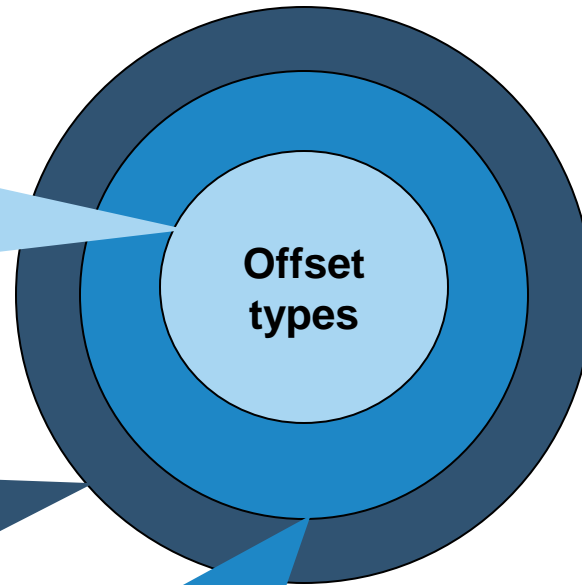
- The Offset Policy of a country defines the mechanism for rerouting procurement funds paid to international contractors back into the spending country

Direct Offset:

Player agrees to coproduce specific components of its products or to obtain related services in buying nation's territory

Indirect Offset:

Player agrees to assist importing country in development of its exports or in investment requirements unrelated to principal contract



Offset types

Semi-direct Offset:

Offsets relative to equipment and/or services that are very similar to items covered by main purchase contract

Probable Defense product offset

- Small arms, mortars, cannons, guns, howitzers, anti tank weapons etc
- Bombs, torpedoes, rockets, missiles etc
- Aircraft and parts, unmanned airborne vehicles, aero engines and parts, aircraft equipment, etc.
- Electronics and communication equipment
- Specialized equipment for military training or for simulation software
- Forgings, castings and other unfinished products, misc equipment, etc. for military



Global examples: Offset Policies Across the Globe

Country	Offset Sector	Minimum Contract Value for offset policy (US \$ Million)	Offset amount as % of contract size	Direct vs. Indirect
India	Civilian and military	\$70	30%	Both
Australia	Civilian and military	\$3 M foreign content/any tender of \$5 M	Maximized where cost effective	Both
Belgium	Civilian and military	Not Specified	100%	Both
Canada	Civilian and military	\$2 preferred \$100 required	Not specified	Both
Denmark	Civilian and military	\$3,800	100%	Both
Finland	Civilian and military	\$13	100% + marketing consulting	Both
Greece	Military	\$1	80-120%	Direct
Israel	Civilian and military	\$0.1	35%	No distinction
Korea, South	Military	\$10	30%	No distinction
Kuwait	Civilian and military	\$4	30%	No distinction



Aerospace and Defense Offset Policy in India

2005: Defense Procurement Policy (DPP-2005), to benefit Indian Defense Industry

Policy introduced 30% offset in contracts valued above Rs 3 billion under “buy” and “buy and make” categories to develop Indian defense Industry

2nd amendment 2008:

- List of products exempted from policy (Annexure-VI of the DPP)
- Removal of license to private industry to participate in offset programmed unless stated by DIPP
- Offset credit banking
- Banking of surplus offset credit
- Exemption of acquisitions under fast track from offset obligations

Offset policy in India

DPP-2005

DPP-2006

DPP-2007

DPP-2008

DPP-2009

DPP-2010

1st amendment 2006:

- Offset made mandatory as prescribed in DPP 2005
- Flexibility of forming joint ventures (JVs) with Indian firms
- Establishment of Defense Offset Facilitation Agency (DOFA)



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Snapshot 2006: Major deals announced under aerospace and defense subject to offset policy in India

Potential US\$18 Billion offset opportunity from 2006

Sector	Items	Deal Amount (\$ Million)	Offset amount @30% (\$ Million)
Defense	126 Fighters	15,000	4,500
	197 Helicopters	700	200
	Maritime, Freighters, AWACS etc.	20,000	6,000
Civil	68 Boeing for Air India	7,700	2,000
	43 Airbus for Indian	2,800	700
	~300 aircraft for other airlines *	18,000	5,000
Total		63,600	18,400

* Not mandatory for non-government deals, but negotiations on country basis possible Source: CLSA Asia-Pacific Markets

** Deals are based on CLSA 2006 Data



Creating the Equation for Growth



Relative market attractiveness for offset opportunities in various countries

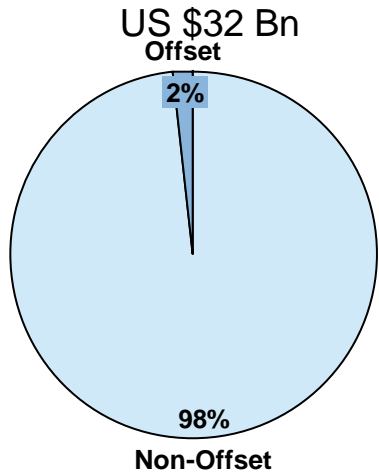
Parameter	India	Australia	Canada	Denmark	Finland	Greece
Manufacturing facility: Composite	Low	Low-Medium	Low-Medium	Low	Low	Low
Manufacturing facility: Metal	Low-Medium	Low-Medium	Low-Medium	Low	Low	Low
Technology and IT services	High	Low-Medium	Low-Medium	Low-Medium	Low-Medium	Low-Medium
Avionics	Low-Medium	Low-Medium	Low-Medium	Low-Medium	Low	Low
Assembly facility	Low	Low-Medium	Low-Medium	Low	Low	Low
Maintenance facility	Low-Medium	Low-Medium	High	Low-Medium	Low-Medium	Low-Medium
Others	Low-Medium	Low-Medium	Low-Medium	Low-Medium	Low-Medium	Low-Medium

 High
  Medium
  Low-Medium
  Low
  No

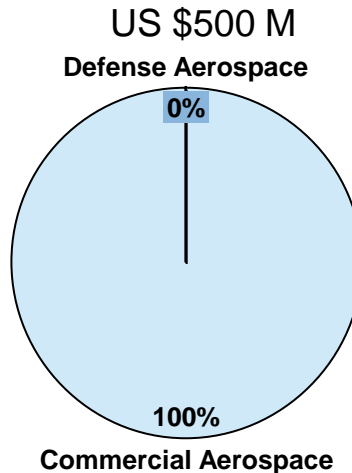


Offset opportunity in India is expected higher in defense sector vs. commercial sector, driven by increasing defense budget and deals in fighter and helicopter segments

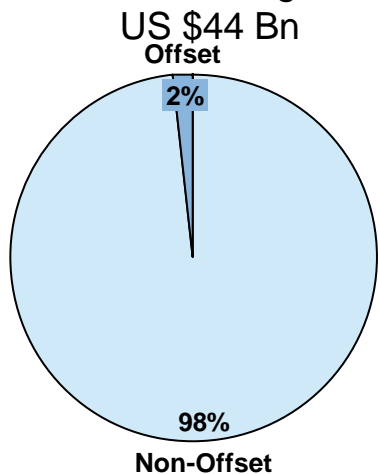
Indian defense budget in 2010



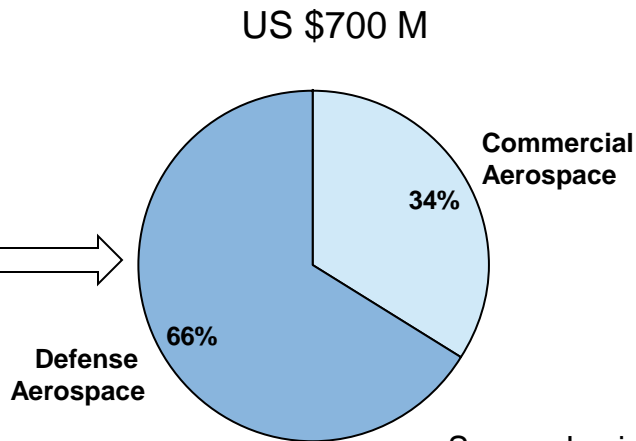
Indian offset market in 2010



Indian defense budget in 2016



Indian offset market in 2016



Source: Lucintel

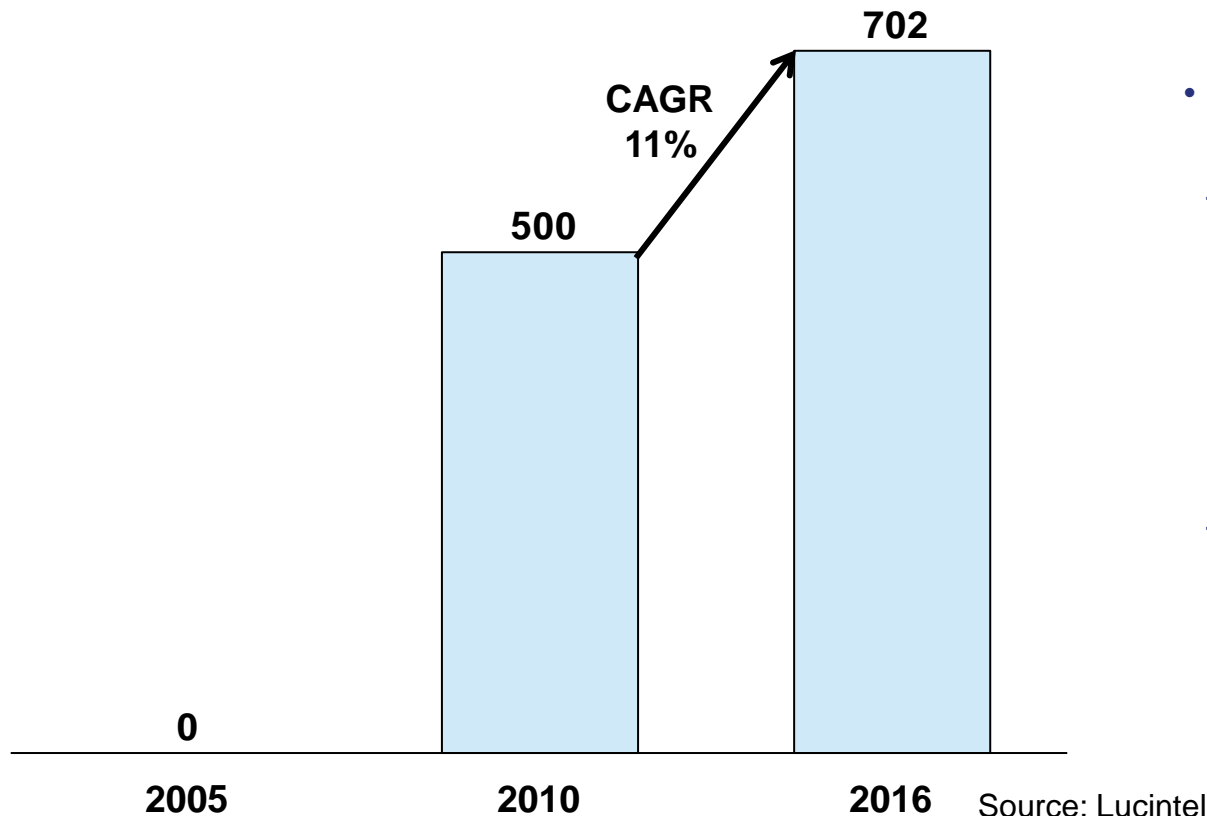
Key Insights

- Increasing Indian defense budget creates more opportunity for foreign investors
 - Expected that defense budget will grow at ~6% CAGR from 2010-2016 reaching US \$44Bn in 2016
- Offset opportunity in India expected to increase reaching ~US \$700M in 2016
 - Offset opportunity is expected to be ~70% of offset market
 - Major driver for defense deals is MRCA (Defense Helicopters Program)



Aerospace and Defense Offset Market In India: Trend and Forecast

Offset value (\$ Million)

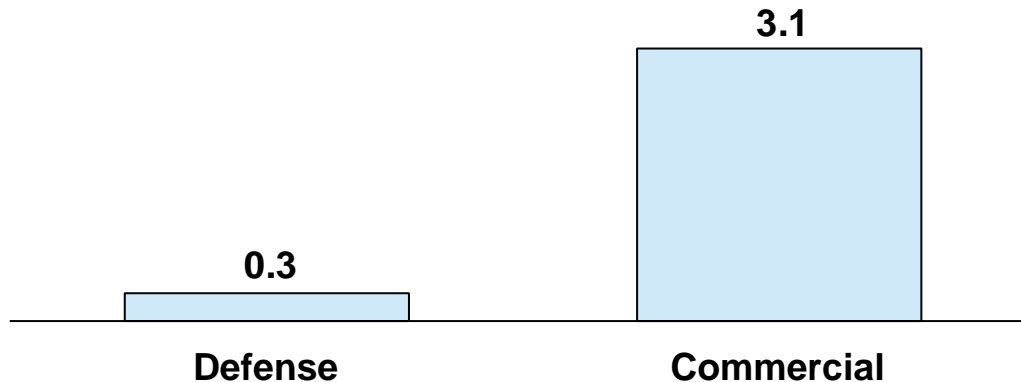


Key Insight

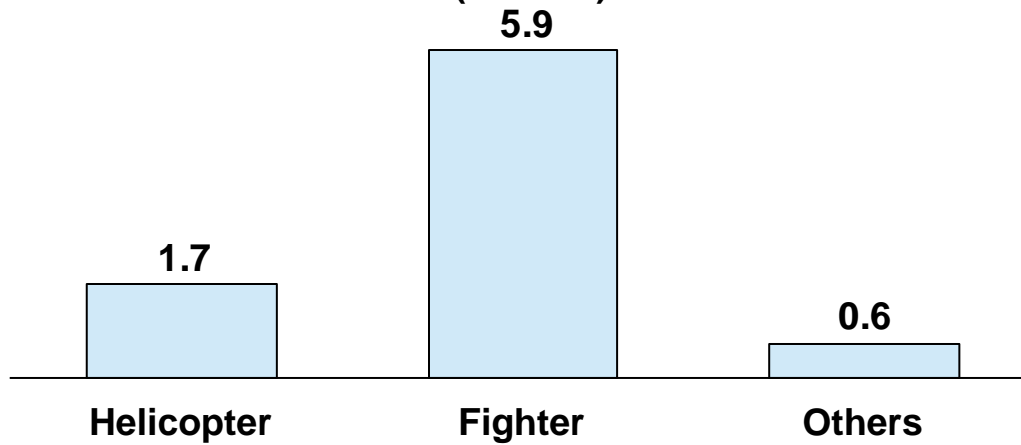
- Total Offset Market for Aerospace and defense is expected to be US \$702M in 2016
- Top deals in offset policy (multi-year)
 - Contract between Boeing and Air India for 68 Boeing planes for US \$7.7Bn
 - B737-800: 18 planes
 - B787-800: 27 planes
 - B777(-300, -200): 23 planes
 - Contract between Airbus and Air India for 43 Airbus planes for US \$2.2 Bn:
 - A319: 20 planes
 - A320: 4 planes
 - A321: 19 planes

Driving Factors for Aerospace Manufacturing in India: Indian Offset Market

Indian Aerospace and Defense offset value (\$ B)
(Deal Finalized till 2010; 4 Deals)



Future India Aerospace and Defense offset value (\$ B)
(7 Deals)

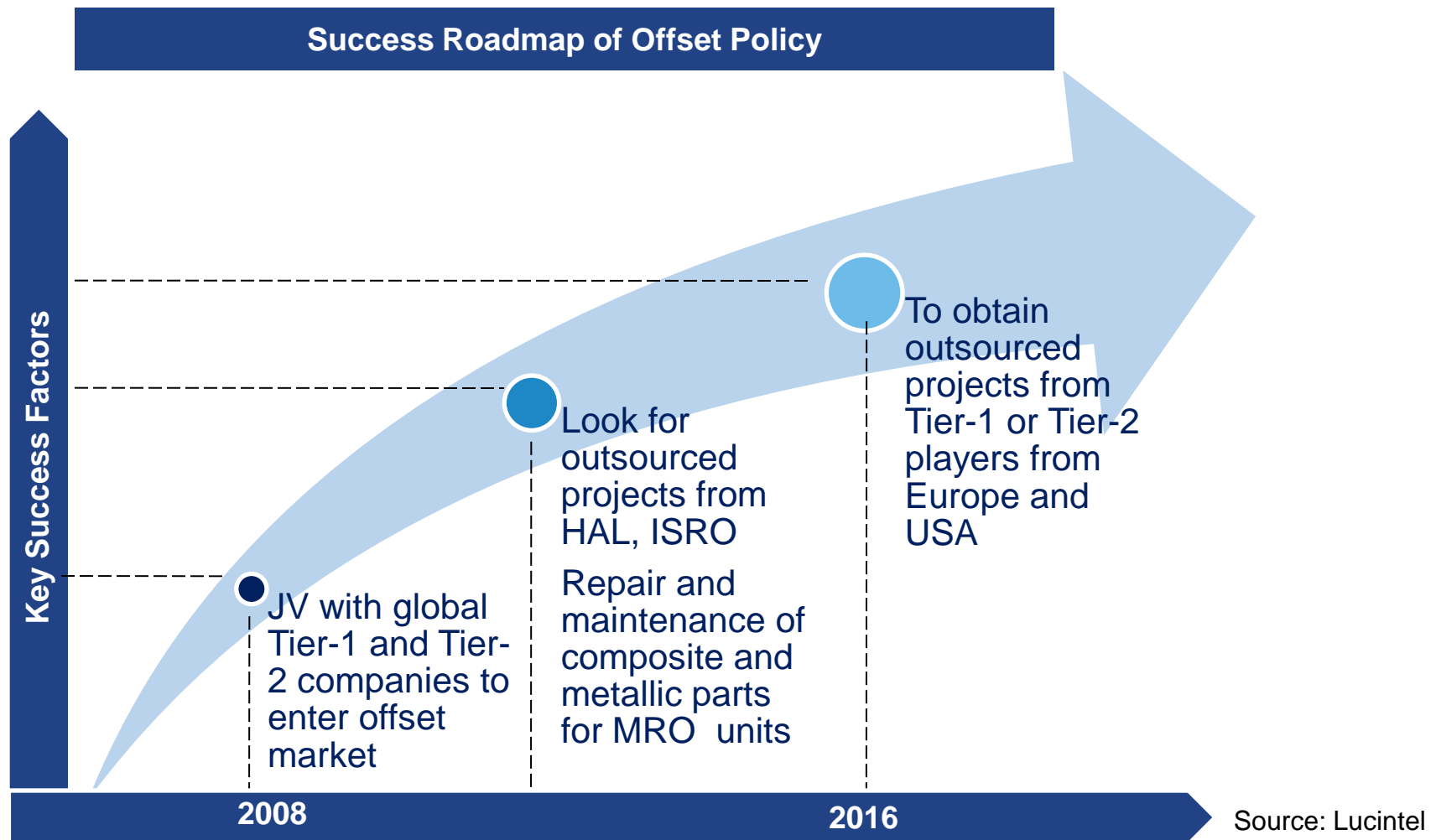


Key Insight

- Until 2010, 10 offset contracts have been realized
- There are 41 offset contracts worth more than US \$11 B in pipeline at various stage of negotiation
- Total offset market for aerospace and defense expected to be US\$11 B over next 10 years (2011-2020)
- More defense deals are expected in next 5 years
 - Obsolescence in current systems & sub-systems
 - Increasing Regional presence with particular counterbalance role to China

Source: IDSA and Times of India articles

Success Roadmap- Offset policy implementation in India



Indian companies most likely to benefit from aerospace and defense offset policy

Companies	Sector
Hindustan Aeronautics (HAL)	Will provide airframe subassemblies and product support for Bell Helicopter. Involved in manufacture of Jaguar aircraft.
Bharat Electronics Limited	State Owned - Electronics, Engineering
NELCO	Electronic products, Automation Systems
Infotech Enterprises	IT solutions in Geo-space, Engg. Design (Close association with Pratt & Whitney)
HCLT, TCS, Satyam, Wipro	IT, ITES
Bharat Forge	Auto Component, Forging
Astra Microwave	RF and Microwave components
Dynamatic Technologies	Hydraulics and Aerospace component mfg.
Mahindra and Mahindra	Autos
Larsen and Toubro (L&T)	Engineering Goods
Titan Industries	Precision equipment manufacturing for aerospace industry

*Source: CLSA 2006



Offset Outsourcing Area in Indian Aerospace and Defense Industry

Outsourcing Maturity in Aerospace

Future outsourcing areas	Engine control systems
	Air control management systems
	Navigation system
Emerging outsourcing opportunities	Embedded development
	Control system design
	Simulation
	High-level aeronautical system design
	Testing services
	Cockpit equipment support software
	Composite structuring
Currently being undertaken by Indian IT vendors	Detailed design for modeling
	Manufacturing
	Drafting and field failure analysis
Non-core commonly outsourced	Testing, validation and verification
	Technical documentation of designing work

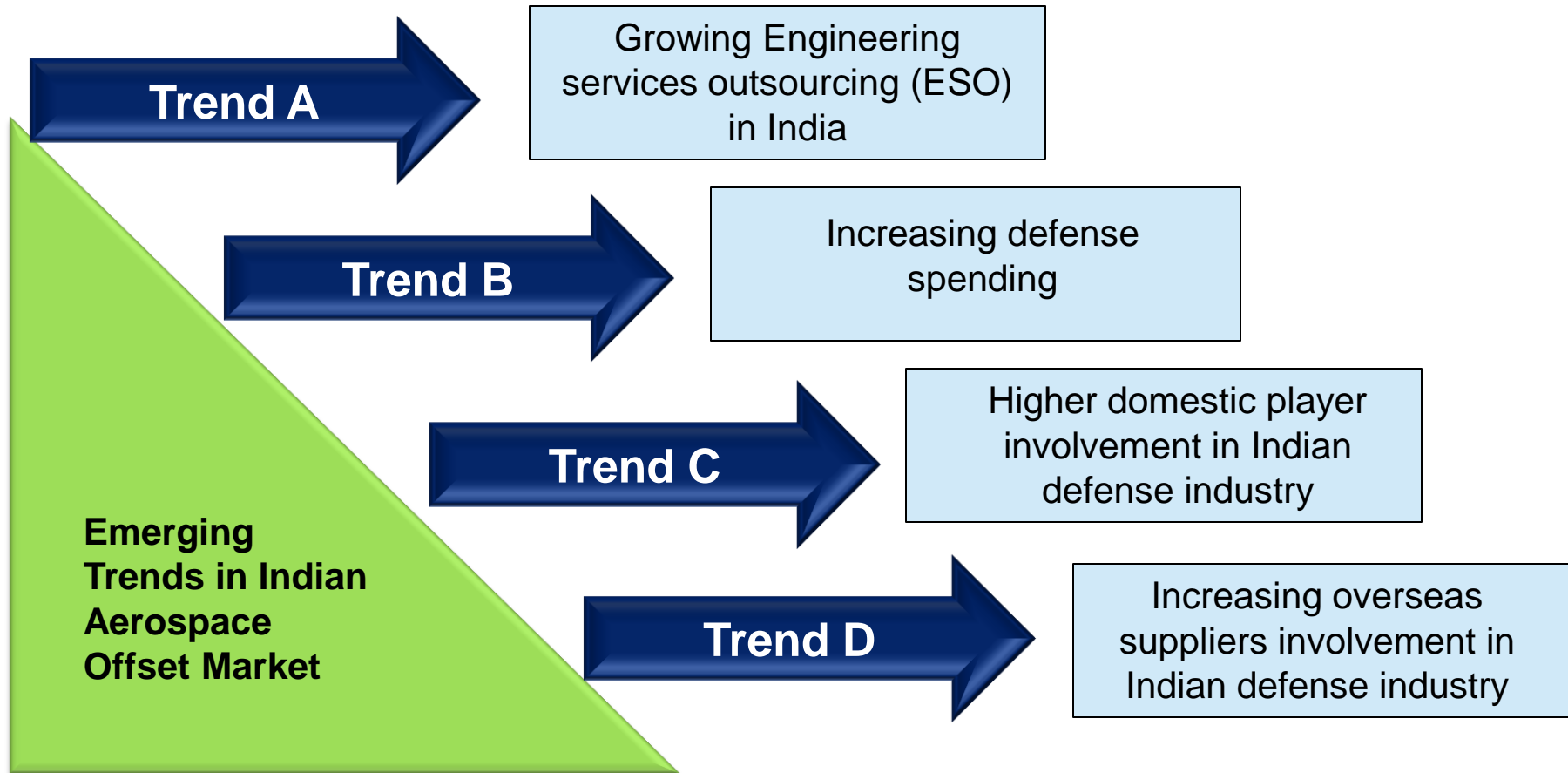


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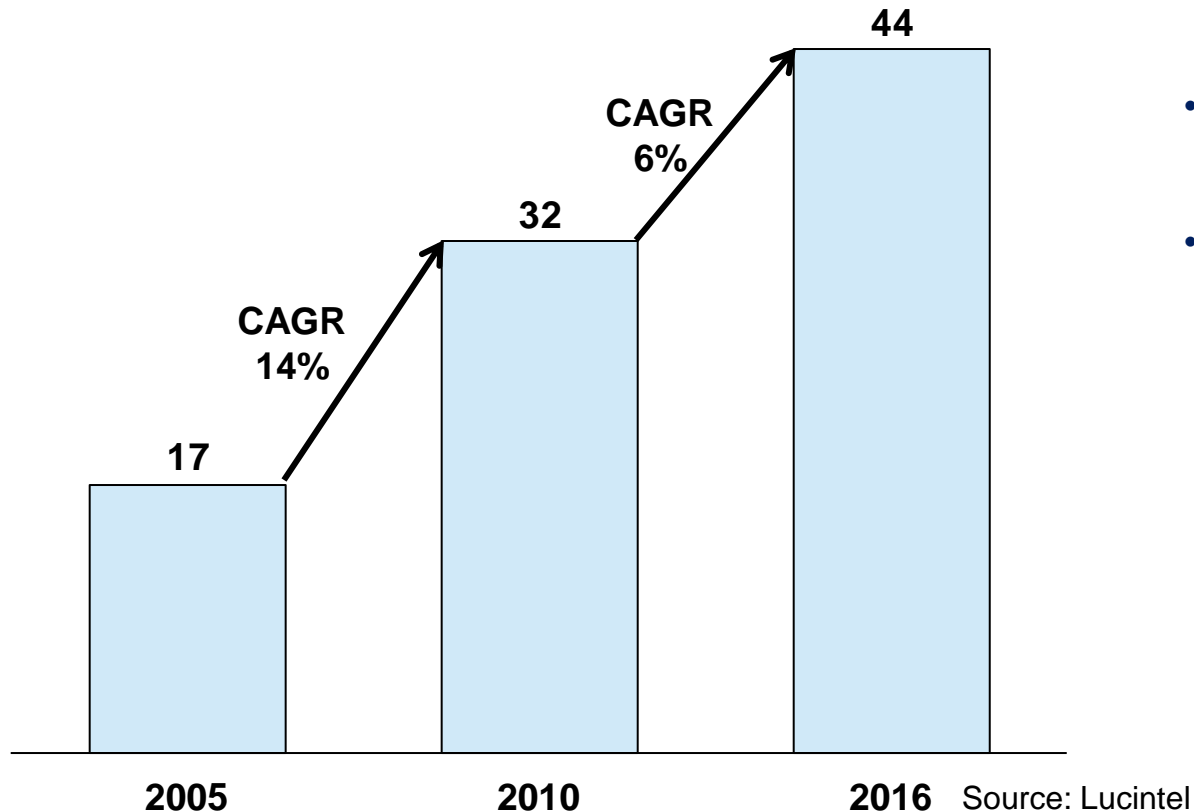


Emerging Trends in Aerospace Offset Opportunity in India



Increasing defense spending; defense expenditure was \$32 B in 2010, expected to \$44 Bn by 2016

India Defense Spending (\$ Bn)



Key Insight

- Indian government currently ranked among top 15 countries in terms of defense expenditure
- Expected Indian defense expenditure will reach US \$44Bn in 2016 with an 8% CAGR
- Growing defense spending increases opportunity for FDI (Foreign Direct Investment) in Indian defense sector:
 - Increasing capital investment on new weapons/platforms
 - Increasing demand for updating equipment attractive market opportunities:
 - 94% of all planned offsets are in aerospace sector and the rest are in manufacture of naval systems

Increasing domestic players involvement in Indian defense industry

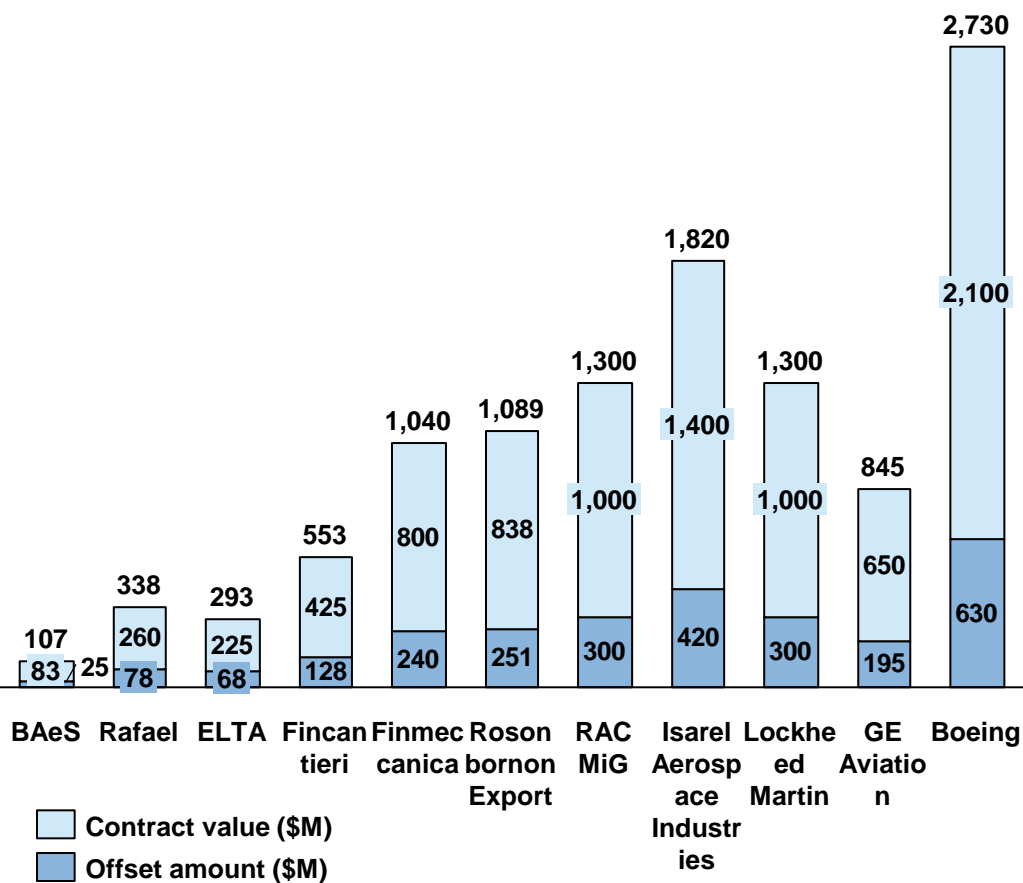
- Introduction of “Buy and Make (Indian)” category in DPP 2009
- 40 Ordnance Factories (OFBs) and eight Defense Public Sector Undertakings (DPSUs) are working in India as defense weapons and systems manufacturers in India
- These DPSUs and OFBs outsource tie-ups with Indian private players and overseas players to improve Indian defense industry infrastructure
- Following are a few agreements made by various foreign and Indian private players:

Objective	Indian Private Player	Foreign Player	Insight
Ballistic Missile Defense (BDM) Systems	Defense Research and Development Organization (DRDO)	Israel and France	Expected date to launch: 2015 Based on radar technology for tracking and fire control
Indian Aircraft Carrier Project 71 INS Vikrant	Shipyards Ltd	Fincanteri and NDB, Russia Cochin	Projected started in 2001-02
Light Combat Helicopter (LCH)	Hindustan Aeronautics Limited (HAL)	Turbomeca, France	Derivative of Dhruv ALH with tandem seating
BrahMos Missile	Defense Research and Development Organization (DRDO)	NPO Mashinostroyeniya, Russia	BrahMos Missile is a supersonic cruise missile and can be launched from submarines
Strategic partnership	Bharat Electronics Limited	Lockheed Martin, Boeing, EADS, Northrop Grumman, Rafael Advanced Defense Systems and Israel Aerospace Industries	



Growing Overseas Suppliers involvement in Indian Defense Industry

Defense procurement contracts from 2008-2010 (\$ million)



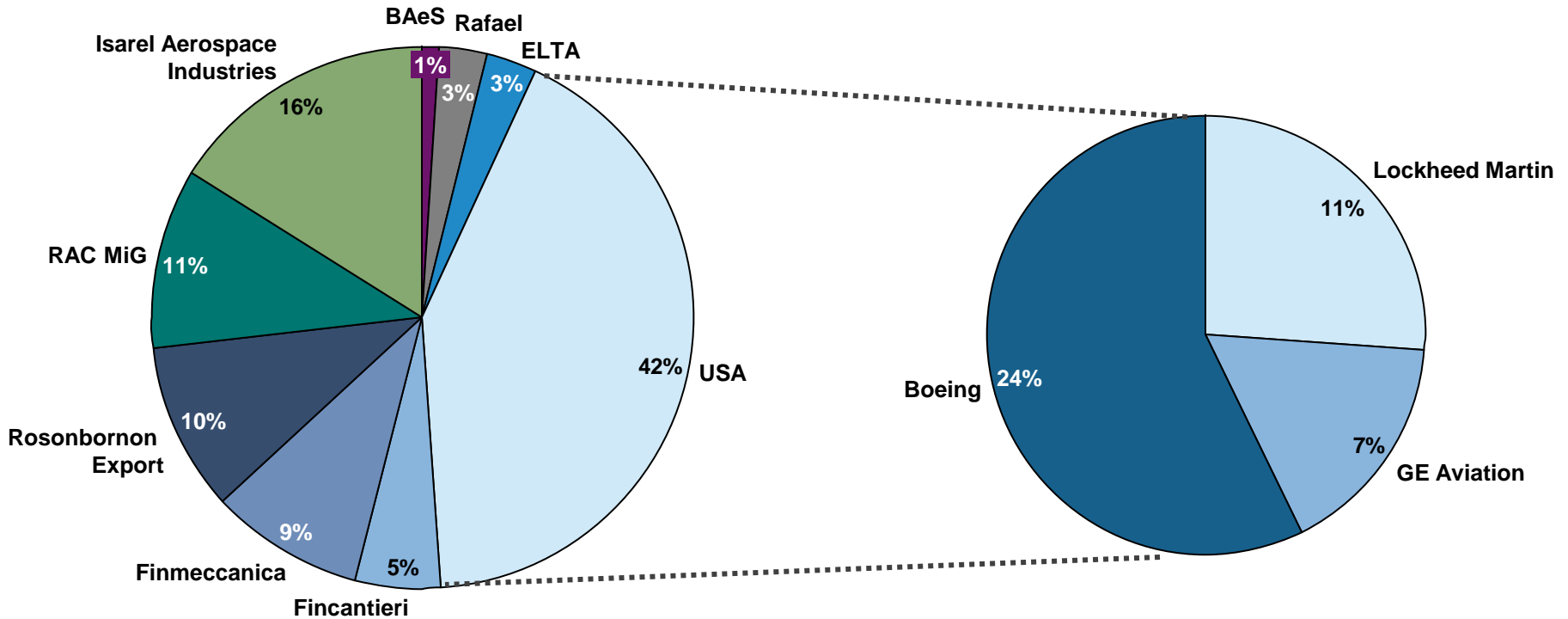
Procurement program	Company	Contract value (\$M)
127 Multi Mission Role Combat Aircrafts (MMRC)	Boeing, Lockheed Martin	10,000
15 Heavy lift Helicopter	Boeing/ Sikorsky	700
10 C-17 Globemaster-III Giant Strategic Lift Aircraft	Boeing	3,000
22 Apache Attack Helicopter	Boeing	550
16 Multi Role Helicopter	Lockheed Martin/ Sikorsky	300
Javelin Anti Tank missile	Raytheon/ Lockheed Martin	900
510 CBU- 105 Sensor Fuzed Weapons	Textron Systems	375
F125IN Engine for Jaguar Fighter Aircraft	Honeywell	670
Quick Reaction Surface to Air Missile Weapon	Raytheon	1,400

*Source: KPMG



Growing Overseas Suppliers involvement in Indian Defense Industry

Distribution of Offset Contracts Awarded by India (March 2008 – October 2010)
 (Total offset value: \$2.65 Bn)



- US companies accounted for ~42% of total offset contracts awarded by Indian government
 - Boeing accounted for ~24% of total deal followed by Lockheed Martin with 11% for the period

*Source: KPMG



Growing Engineering services outsourcing (ESO) in India

Growing Engineering Services Outsourcing (ESO) in India drives Indian ITES sector

- Indian aerospace and defense ITES sector was estimated \$30 Bn in 2010
 - Aerospace and defense ESO opportunity accounted for \$700 M in 2010
 - Aerospace and defense ESO market is expected to reach \$50 Bn in 2020
- Objective of ESO are product design, development and testing with CAD/CAM design, fluid dynamics, 2D & 3D modeling, remote monitoring, system architecture development, and associated technologies
- Approx 10 companies such as Boeing, Airbus, Raytheon, Pratt and Whitney, Northrop Grumman and Magellan Aerospace are setting their captive centers in India
 - It is expected that EOS in India will help foreign players to reduce design costs ~30%-40% and shorten design cycles
 - Following are few major deals in Indian ITES sectors under EOS

Company	Boeing	Airbus	Pratt & Whitney
HCL Technologies	✓	✓	
Infosys	✓	✓	✓
Tata Consultancy Services (TCS)	✓		
Larsen and Toubro (L&T)	✓	✓	✓

✓ Represents contracts among companies

*Source: CLSA 2006



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Findings/Conclusions

- Total Offset opportunity is expected to surpass US\$12Bn over the next 10 years driven by:
 - Increasing Indian defense budget, expected to reach US\$44Bn in 2016
 - Making Indian defense market lucrative for foreign players and bringing FDI
 - Increasing procurement plans for new weapons/programs and increasing demand for updating equipments
- In future, defense sector will see more offset opportunity than commercial aerospace
 - Defense market will account for more than ~60% of total Indian offset market in 2016
- Majority of offset opportunity in India will be in MRO sector, Technology and IT sector, ESO, Part manufacturing, control systems, Navigation system & Simulation and training
- Currently, there is a technology gap in Indian aerospace industry vs. developed nations and Indian aerospace industry lacks strong supply chain
 - Technology partnership by domestic players with multi-nationals will shorten this gap
- In next 10 years, there will be significant joint venture opportunities in Indian aerospace industry. Companies entering early will benefit from future growth potential
- There is an expected increase in multi-national companies in the Indian aerospace industry over next 10 years:
 - Companies such as Boeing, Lockheed Martin, Sikorsky, Raytheon, Textron Systems have their long term investment strategies for India



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About Lucintel

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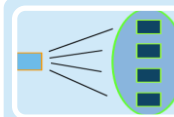
Consulting



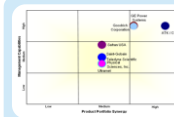
Growth and Strategic Consulting



Benchmarking



Opportunity Screening



Partner Search and Evaluation



Due Diligence and M&A



Market Entry Strategy

Lucintel has an extensive toolkit to address key strategic questions for increasing your company's profitability and market presence



Key Questions

- **Is market space / opportunity of current product offerings sufficiently robust?**
- **Markets are focus for many: how can my company profitably differentiate?**
- **Based on our core skills, where should we focus?**
- **Should we build or buy? Is build even an option?**
- **What game changer actions exist and/or is a more incremental approach best?**
- **What is the order sequence of market entry segments / products?**

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