



सत्यमेव जयते

GOVERNMENT OF GUJARAT

Manufacturing of Defence Aircraft & Helicopters

Aerospace and Defence

Government of Gujarat



TM

10-13 Jan

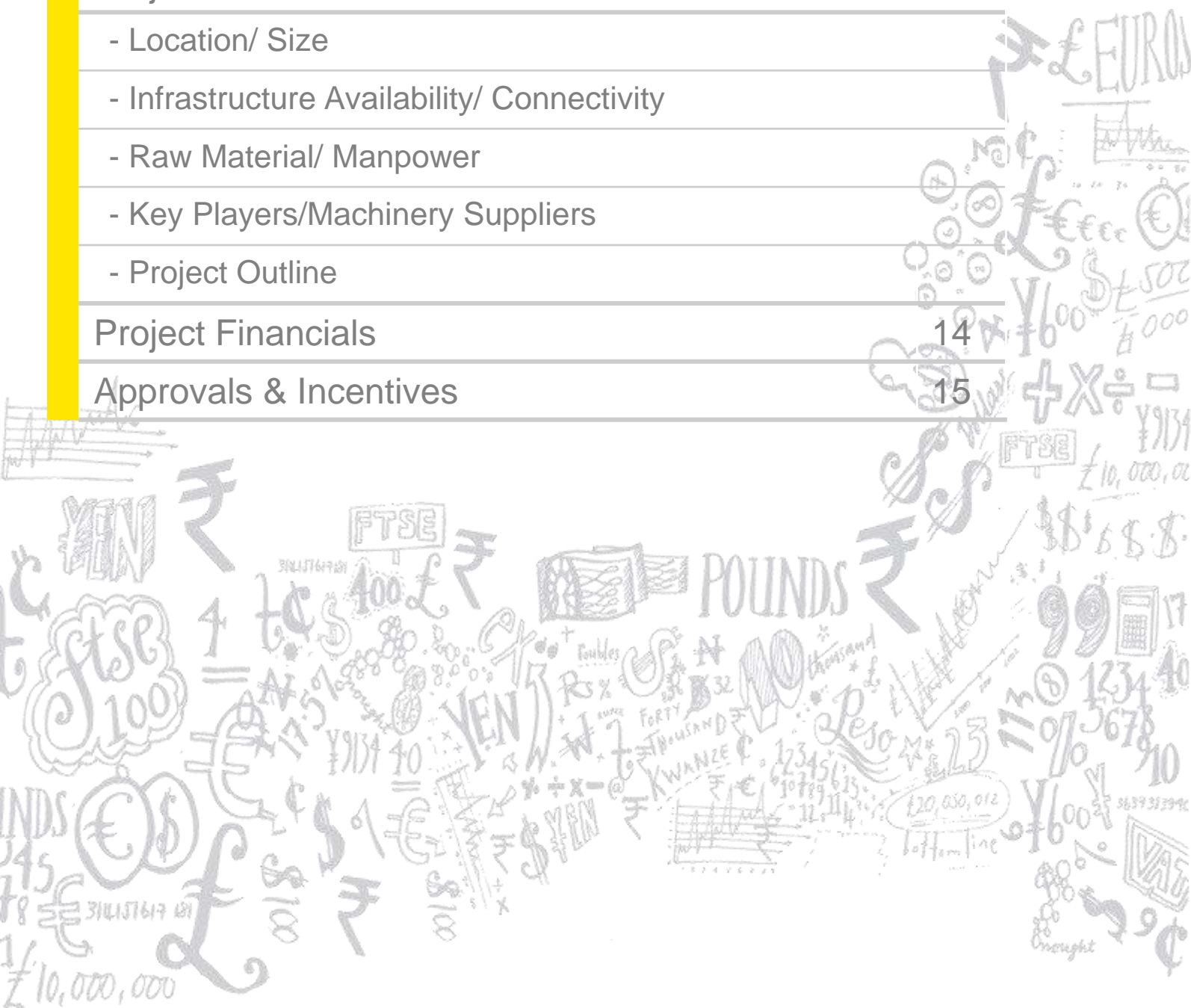
GUJARAT 2017

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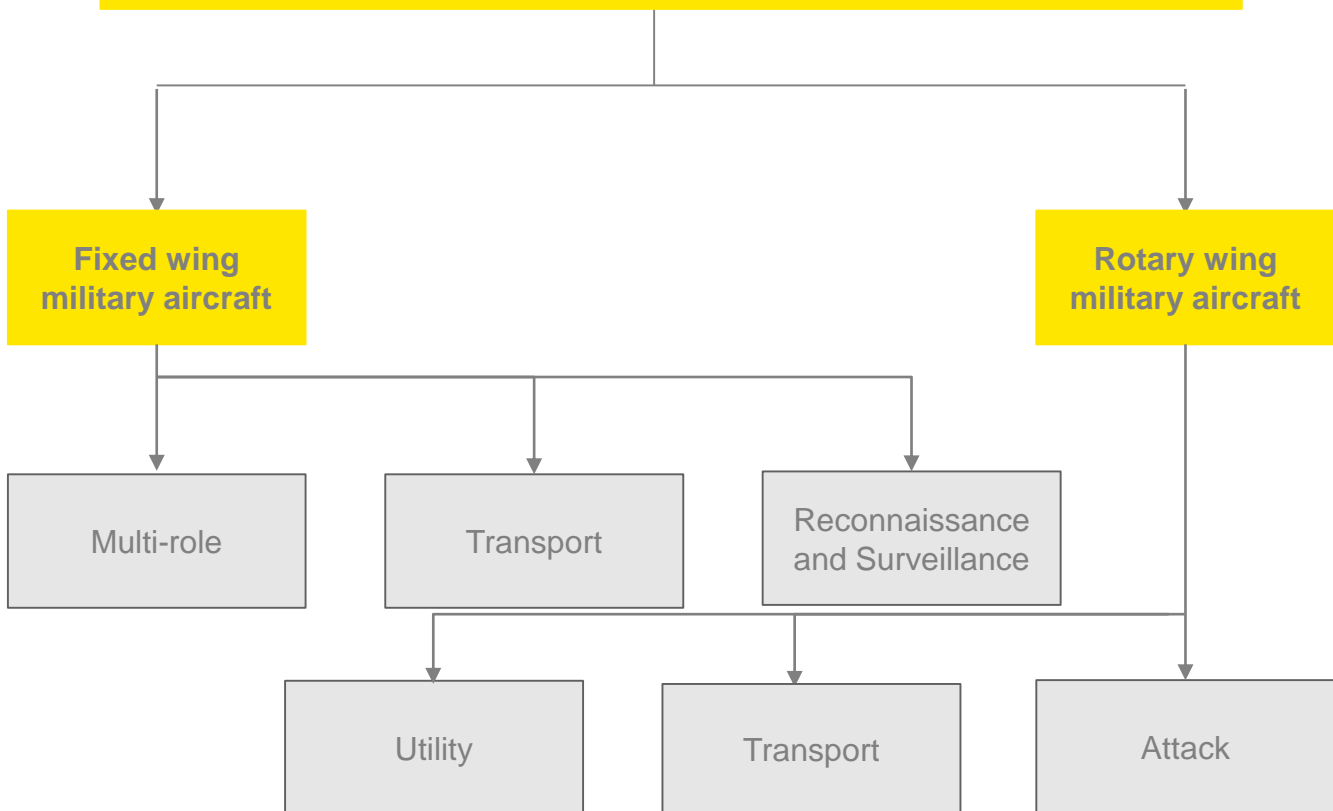
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Defence/military aircraft: overview

- ▶ A military aircraft is any fixed-wing or rotary-wing aircraft that is operated by a legal or insurrectionary armed service for defence purpose. Military aircraft can be either combat or non-combat.
- ▶ Combat aircraft are designed to destroy enemy equipment using their own aircraft ordnance while non-combat aircraft roles include search and rescue, reconnaissance, observation/surveillance, Airborne Early Warning and Control (AEWC), transport, training, and aerial refuelling.
- ▶ In 2015, the Indian market for military aircraft was expected to be worth US\$6 billion which is likely to increase to >US\$8 billion by 2025.

Classification of defence aircraft



- ▶ Defence contractors are focusing on developing a new category, multi role rotary wing aircraft or helicopters driven by increasing involvement in sub conventional operations and reducing budgets.
- ▶ A multi role helicopter can provide better speed of action and turnaround distance, multiple options in terms of operations, a cost effective life cycle maintenance and reduction in logistical footprint.

Source

"Defense Expenditure in India to 2020: Market Review", Strategic Defence Intelligence, August 2015

"Air Force Expenditure in India to 2020: Market Brief", Strategic Defence Intelligence, May 2015

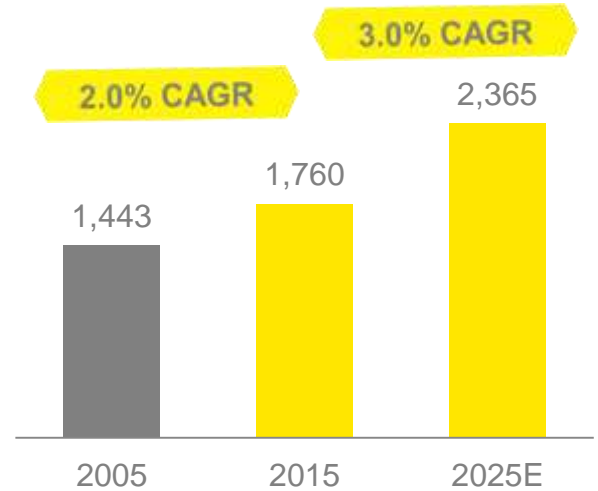
"The Military Fixed Wing Aircraft Market in India to 2025: Market Brief", Strategic Defence Intelligence, March 2015

<http://fas.org/man/dod-101/sys/ac/rotary.htm>

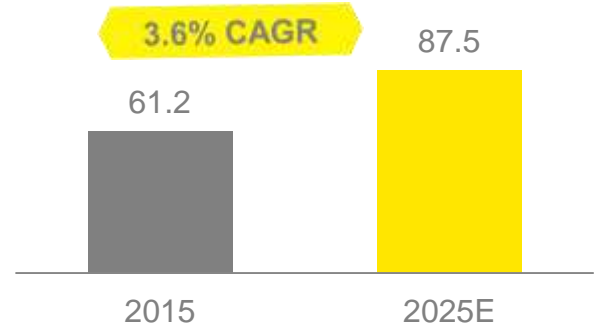
Global defence market

- ▶ The global defence market is expected to reach US\$2,365 billion by 2025 growing at a CAGR of ~3% during 2015-2025. The growth will be driven by the emerging markets.
- ▶ The key catalysts driving the global defence spending are military modernization by major defence markets, protection of maritime borders, increasing military spending based on NATO commitment levels and rising asymmetric threats of terrorist organizations.
- ▶ During 2005-2015, the global defence spending grew at a moderate CAGR of ~2% mainly driven by increasing spending of emerging countries partially offset by lower defence spending of developed countries due to economic slowdown.
- ▶ Americas region is the largest defence spender however, by 2025, the centre of gravity of global defence spending will shift from developed markets to emerging markets, particularly Asia Pacific and especially in India and China.
- ▶ The US is the largest defence spender which is spending more than one-third of the global defence expenditure, followed by China with more than 12% share. Other key defence markets include Russia, Saudi Arabia, France, the UK, India and Germany.
- ▶ The global military aircraft market is estimated to grow at a higher rate (3.6%) compared with the annual defence spending growth driven by development of new defence aircraft such as F-35, V-22 etc.

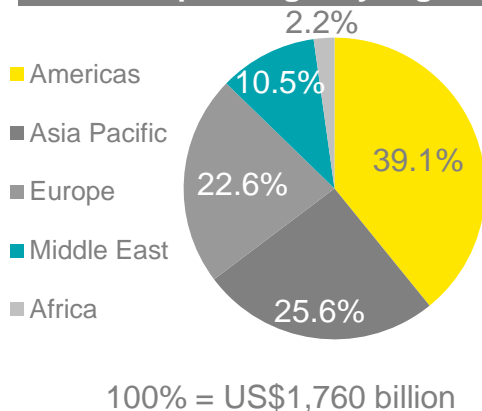
Global defence spending (US\$ billion)



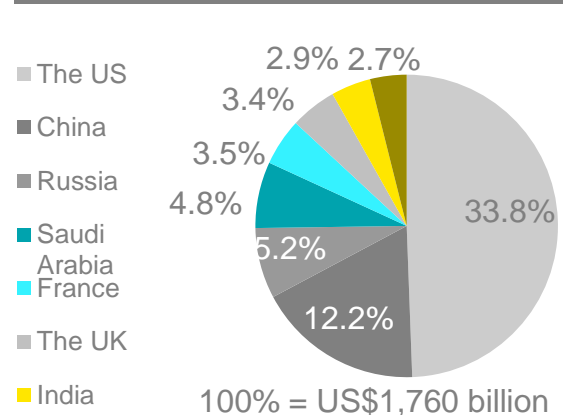
Global military aircraft market (US\$ billion)



Defence spending – by region (2015)



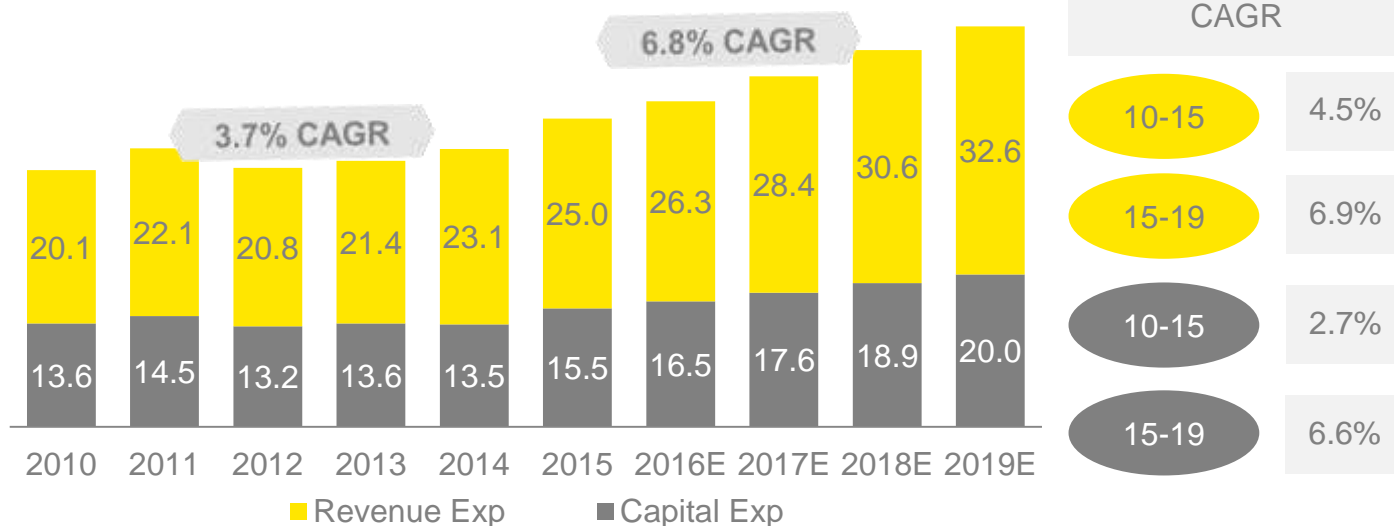
Defence spending – by country (2015)



Source
IPRI Military Database
<http://www.nuveen.com/Home/Documents/Default.aspx?fileId=67157>

Market Potential - India

**Defence budget India
(in US\$ billion)**



- ▶ The Indian defence market is the seventh largest defence market across the globe with over US\$40 billion budget. The market is expected to witness a healthy growth rate till 2019, growing at a CAGR of 6.8%.
- ▶ India is expected to spend more than US\$250 billion on defence equipment and services by 2022 and ~40% of the defence budget is dedicated to capital expenditure that focuses on capacity building for arms and related equipment.
- ▶ Around 60% of India's defence requirements are met through imports. However, the Government of India has set a target of meeting 70% of defence needs internally by 2019. This opens up a huge opportunity in this sector.
- ▶ The government has launched its 'Make in India' initiative and also has streamlined its Defence Production Policy (DPP) to boost indigenous manufacturing of defence equipment.
- ▶ India's military aircraft market is likely to grow at a CAGR of 4.3% from ~US\$6 billion in 2015 to >US\$8 billion.

- ▶ India's defence will need about 1,000 additional helicopters by 2020. The Indian armed forces are in urgent need of ~440 Reconnaissance and Surveillance Helicopters (RSH) and 123 Naval Utility Helicopters (NUH).
- ▶ The need will be addressed through direct imports, licensed manufacture, local design & production, and JVs with foreign OEMs.
- ▶ Currently, 4 helicopter programs are open to competition, covering a total of 434 defence helicopters

Capital investments in pipeline

Proposal	Quantity	Cost (US\$ million)
Medium light helicopter	172	286
ASW helicopter	NA	391
Naval multi-role helicopters	16	1,000
Combat helicopters	22	550

Source

<http://www.defense-aerospace.com/articles-view/feature/5/161631/making-sense-of-india%E2%80%99s-military-helicopter-plans.html>

"Defence Expenditure in India to 2020: Market Review", Strategic Defence Intelligence, August 2015

"Air Force Expenditure in India to 2020: Market Brief", Strategic Defence Intelligence, May 2015

Growth Drivers



1

Modernization of armed forces

India is focusing on military modernisation and has explicitly spelt out in the Long Term Integrated Perspective Plan (LTIPP), for military modernization, covering the period up to 2027. The Indian armed forces are also expected to purchase military aircraft worth US\$70 billion during 2015-2025.

2

Offset requirement by Government of India (GoI)

GoI has set an offset requirement of at least 30% for all defence equipment. According to the offset policy, the foreign vendor is obligated to invest at least 30% of the deal value in the Indian defence industry which is likely to create a market opportunity worth US\$50 billion. The offset policy can be discharged through setting up military aerospace component facility in India or by procuring directly from Indian part suppliers.

3

Indigenous manufacturing of defence equipment

The government is focusing on increasing indigenous defence equipment manufacturing. The private players are also allowed and various exemptions such as license charges, expenditure on purchase, lease or rental of land/land rights, capital expenditure, etc. are provided to boost private participation in the defence sector.

4

Labour cost advantage

India offers a cost advantage in manufacturing for both material and labour cost. Compared to other defence manufacturing destinations such as Russia and South-East Asia, the engineering labour cost offer a 20-30% cost advantage while the manufacturing labour cost advantage is around 15-25%. These advantages are even higher when compared with Europe and North America.

5

Simplification of procedures for Buy and Make Indian

The Defence Procurement Procedure (DPP) 2013 and 2016 have given highest preference to Buy and Make (Indian) category for any requirement allowing the private industry to participate in maintenance and transfer of technology (ToT) thereby providing a level playing field to it with foreign OEMs and DPSUs.

Source

"Defense Expenditure in India to 2020: Market Review", Strategic Defence Intelligence, August 2015

"Air Force Expenditure in India to 2020: Market Brief", Strategic Defence Intelligence, May 2015

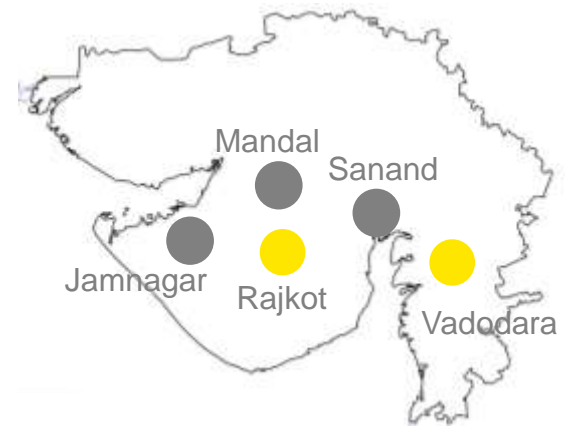
Gujarat - Competitive Advantage



Strong Micro Small Medium Enterprise (MSME) base

- ▶ MSMEs play an important role in the defence manufacturing supply chain as most large companies use MSMEs to deliver significant parts of their projects.
- ▶ Gujarat has Engineering MSME clusters in and around Ahmedabad, Rajkot & Vadodara Districts and is ranked as the best Indian state for MSME asset base.
- ▶ The SME companies play a critical role in the entire supply chain for the A&D sector.
- ▶ Gujarat aims to target 35% of the possible Defence Offsets to be sourced from India.
- ▶ Gujarat's industrial sector comprises of over 5,75,000 MSME's providing employment to 3.7 million people. The MSME sector in Gujarat registered a CAGR of 19% since 2009.

Leading MSME clusters in Gujarat

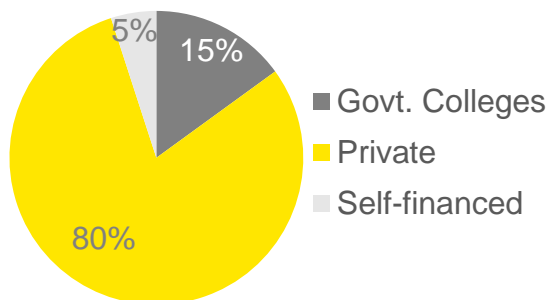


- ▶ Gujarat has emerged as the preferred destinations for private players to set up defence manufacturing units. Since May 2014, the state got maximum number of industrial licences (22 same as Maharashtra) and include some key defence projects such as armoured fighting and bullet proof vehicles, UAVs, electronic warfare equipment and defence helicopter manufacturing.

Gujarat offers an excellent technical educational infrastructure for the aerospace and defence industry

- ▶ Gujarat has ~120 engineering degree colleges with an approximate intake of more than 60,000 students per year.
- ▶ The tally leads for Mechanical Engineering with 16,230 seats, followed by Civil (9,950 seats), Electrical (9,839 seats) and Computers (8,160 seats).

Degree colleges in Gujarat



Leading Aeronautical engineering colleges in Gujarat:

- ▶ Indian Institute Of Aeronautical Engineering & Technology
- ▶ Gujrat Institute Of Aeronautical & Telecommunication Engineering
- ▶ Gujarat Technological University - Ahmedabad
- ▶ Ahmedabad Institute Of Aeronautical Engineering And Information Technology – Ahmedabad
- ▶ Sardar Vallabhbhai Patel Institute of Technology (S.V.I.T.) – Valsad
- ▶ Western India Institute Of Aeronautics – Ahmedabad
- ▶ School of Aeronautics, Dwaraka

Source
 "Manufacturing Sector – Profile", Vibrant Gujarat website, 7 October 2014
 "Gujarat – Growth and Prosperity for All", Vibrant Gujarat website, 25 August 2014



Ease of doing business

- ▶ Only state which comply 100% with the environmental procedures. Gujarat fares highly when it comes to setting up a business, allotment of land and obtaining a construction permit.



Flourishing economy

- ▶ Gujarat contributes 7.2% of the Nation's GDP and shows leadership in many areas of manufacturing and infrastructure sectors. Gujarat's SDP (State Domestic Product) at current price registered a growth of 11% during the year 2014-15.



Strategic location and better infrastructure

- ▶ Located on the west coast of India, Gujarat is well connected to the major cities of the world by air and sea routes. The state has 45 ports, 12 domestic airports and 1 international airport in addition to an extensive rail and road network.



Easy availability of raw materials

- ▶ Many key industrial clusters such as foundry & forgings, steel pipes and tubes, steel re-rolled products and fabricated metal products are located in close vicinity of industrial hubs such as Dholera Special Investment Region (SIR).



Favourable labour policy

- ▶ The Gujarat government has recently passed the Labour Laws Bill (December 2015), to give an impetus to industrialization. The key reform includes a provision for out-of-court settlement to speed up the process labour related dispute resolutions.



Better social infrastructure

- ▶ Gujarat has one of the lowest cost of living amongst the Indian states and is relatively less congested and less polluted, offering better standards of living to the inhabitants and providing a better environment to work.

Source

"Gujarat – Growth and Prosperity for All", Vibrant Gujarat website, 25 August 2014

"Manufacturing Sector – Profile", Vibrant Gujarat website, 7 October 2014

Project Information



Location suggested: Dholera special investment region (SIR)

- ▶ Dholera SIR is an indicative location to set up defence aircraft manufacturing plant. The facility can be set up in any other suitable location in Gujarat alternatively.
- ▶ Dholera is coast city in Gulf of Khambatt located on the Delhi Mumbai Industrial corridor (DMIC).

Dholera SIR : Key highlights	
Area	920 sq. km
Developable area	567 sq. km
Land price	INR 600/ sq. meters (Oct'15)
Focus industries	Heavy Engineering, automobile and auto ancillary, defence , electronics, pharmaceuticals, metals and metallurgical products, agro and food processing, IT and ITeS



- ▶ Government of Gujarat (GoG) is offering plots measuring up to 8 sq. kms area to promote defence manufacturing in Dholera (large area facilitates operating and testing of defence equipment).
- ▶ Robust infrastructure in the region (refer to the next slide for details).
- ▶ Provide access to both domestic and international market as a new sea port is proposed in the region (Kandla port is at a distance of around 300 Kms).

Industry	Location (Distance from Dholera)	Industry	Location (Distance from Dholera)
Foundry & Forgings	<ul style="list-style-type: none"> ▶ Kheda (91 km) ▶ Anand (94 km) ▶ Surendranagar (88 km) 	Plastic and polymers	<ul style="list-style-type: none"> ▶ Sanand (97 kms) ▶ Dahej (210 kms)
Steel	<ul style="list-style-type: none"> ▶ Hazira (310 Km) 	Glass	<ul style="list-style-type: none"> ▶ Vadodara (372 kms) ▶ Jhagadia (211kms)

Source

"Dholera making it big as defence manufacturing hub", Business line website, <http://www.thehindubusinessline.com/news/national/dholera-making-it-big-as-defence-manufacturing-hub/article8253626.ece>, accessed 14 June 2016

"Dholera International Airport", CAPA website, <http://centreforaviation.com/profiles/newairports/dholera-international-airport>, accessed 16 June 2016

About : Dholera SIR, <http://dholerasir.com/>, accessed 16 June 2016

"HIGH SPEED METRO RAIL", <http://www.investindholerasmartcity.com/dholera-metro-rail-project/>

"Port of Dholera (India)" https://www.searates.com/port/dholera_in.htm

"Gujarat plans Rs 1,000 crore Dholera airport project to take on world's best in Dubai", The economic times website,

http://articles.economictimes.indiatimes.com/2015-02-05/news/58838216_1_five-runways-dubai-airport-on-dubai, accessed

Land price" <http://www.magicbricks.com/property-for-sale/ALL-COMMERCIAL-real-estate-Dholera-Sir-in-Ahmedabad/>, accessed 16 June 2016

"Aluminum plant in gujarat", <http://www.thehindubusinessline.com/economy/rs-15000-cr-alumina-project-to-come-up-near-mundra-minister/article5231540.ece>, accessed 17 June 2016

Infrastructure Availability

Logistics & Connectivity



Rail

- ▶ Rail connection is being planned for Dholera, while the nearest meter gauge connection is Bhavnagar (34 km) and the nearest broad gauge station is Tarapur (103 km).
- ▶ A metro rail is also being planned from Gandhinagar to the Dholera SIR via Ahmedabad.



Road

- ▶ National Highways: NH-8 connects the Dholera SIR with Ahmedabad, Bhavnagar and Mumbai. The region also has a good connectivity with NH-8A which connects it to Anand and Vadodara.
- ▶ As a part of Golden Quadrilateral, the 500 km Mumbai- Ahmedabad- Vadodara Express way connects the region.



Air

- ▶ The Dholera SIR is surrounded by four peripheral airports Ahmedabad, Vadodara, Bhavnagar, and Rajkot.
- ▶ Also, it is very near to the newly planned Dholera international airport which is expected to become operational by 2018.



Port

- ▶ A port site is proposed to be connected by road with Ahmedabad-Bhavnagar highway at a distance of about 11 kilometres from the Dholera SIR. Almost 2,057 hectares of Government land was allocated for the development of port site.

Utility



Water

- ▶ Gujarat Industrial Development Corporation (GIDC) will provide water to the proposed facility.



Power

- ▶ Electricity is supplied from an 132 KVA sub-station operated by Gujarat Energy Transmission Corporation (GETCO) located in the premises.



Gas

- ▶ Gujarat State Petroleum Corporation (GSPC) is the gas supplier to the site through a well established pipeline.
- ▶ The company needs to directly apply for gas to GSPC.

Key Players and Suppliers



Key players - India

Company	Sector
Hindustan Aeronautics (HAL)	Airframe subassemblies and product support
Bharat Forge	Component and forging of aerospace components
Astra Microwave	RF and Microwave components
Dynamatic Technologies	Hydraulics and Aerospace component manufacturing
Larsen and Toubro (L&T)	Engineering Goods
Titan Industries	Precision equipment manufacturing for aerospace industry
TAL Manufacturing Solutions Ltd.	Aero-structures and other spare parts for aircraft
Taneja Aerospace & Aviation Limited	Aero-structures and aircraft parts
QuEST	Mechanical systems and structures for A&D industry
Mahindra Aerospace	Aero-structure components and aircraft development services
Godrej Aerospace	Aerospace manufacturing

Key suppliers (machinery) - India

Company	Location	Type of machinery
J & J Engineering Works	Bangalore	Aircraft models
Avi-Oil India (P) Ltd.	New Delhi	Aviation oils and lubricants
Avdel India Pvt. Ltd	Mumbai	Tools for forging and machining
Unique Instruments & Mfrs. Pvt. Ltd	Bangalore	Ground support equipment
Raghav Aerospace Manufacturing Technologies Pvt Ltd	Hyderabad	Precision aerospace components
Essae Teraoka Limited	Goa	Heavy-duty electronics
Instrulab Pvt. Ltd.	Chennai	Cock-pit instruments
Communications Ltd	Hyderabad	Avionics items

Source

Advanced Manufacturing Technologies Virtual Innovation Showcase Target Indian Companies April/May 2016

http://www.hal-india.com/Common/Uploads/DMS/Vendor_directory_Aircraft.pdf

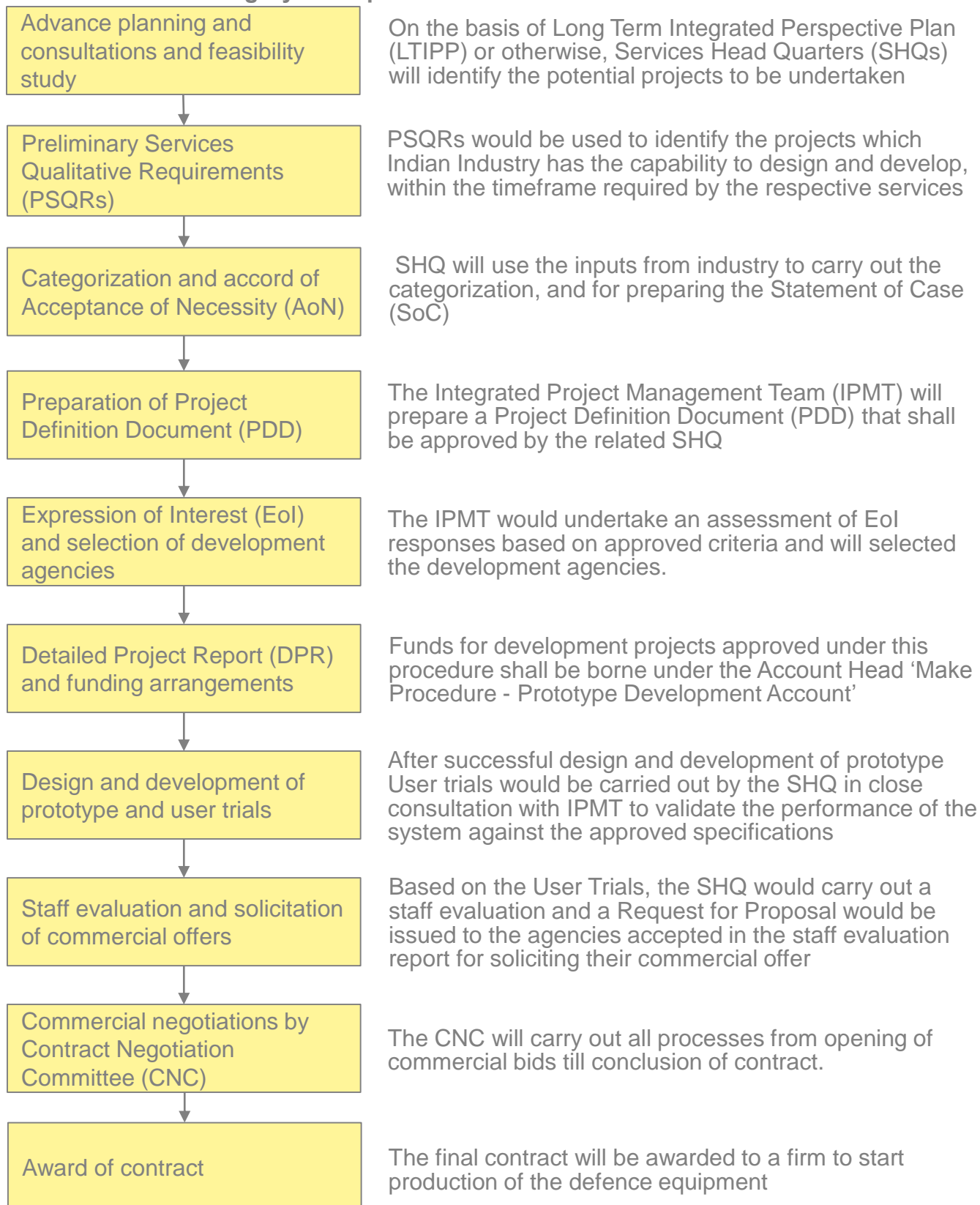
Key components for helicopter manufacturing



<p>Airframe</p>	<p>Fuselage</p>	<p>Main rotor system</p>	<p>Transmission System</p>
<ul style="list-style-type: none"> ▶ The airframe is the fundamental structure of the helicopter, made of composite materials 	<ul style="list-style-type: none"> ▶ Fuselage is an aircraft's main body section that houses the cabin which holds the crew and cargo. 	<ul style="list-style-type: none"> ▶ It consists of a mast, hub and rotor blades, mainly made of metal, that provides lift to the helicopter 	<ul style="list-style-type: none"> ▶ Transmission system transfers power from the engine to the main rotor, tail rotor, and other accessories
<p>Engine/power plant</p>	<p>Landing gear</p>	<p>Tail rotor systems</p>	
<ul style="list-style-type: none"> ▶ Different types of engines such as reciprocating and turbine engines are used to power the helicopter 	<ul style="list-style-type: none"> ▶ Tubular landing skids and gears are often used by helicopters to save weight and volume 	<ul style="list-style-type: none"> ▶ The tail rotor is a smaller rotor mounted so that it rotates near-vertically at the end of the tail to provide thrust 	

Project Structure & Implementation Model

Procedure for 'Make' Category of Acquisition



Source

DPP – 2016, http://www.iesonline.org/downloads/defence_procurement_procedure-2016.pdf

Project Financials



Project cost

- ▶ The total project cost of setting up a defence helicopter manufacturing unit is INR 30-INR40 billion. The facility would manufacture different type of defence helicopters such as Light Combat Helicopter (LCH), Light Utility Helicopter (LUH) and Naval Multi-role Helicopters.

Project specifications	Details
Land requirements for the facility	610 acre
Number of defence helicopter produced annually	40
Direct employment generation	3,000
Approximate cost required for setting up a plant	INR 40 billion

Pay-back period

Number of helicopters produced annually	40
Growth rate	~10%
EBITDA margin	10%
Total payback period	~13 years

Other proposed projects

Company	Helicopter type	Location	Investment	Other details
Airbus	Navy and utility helicopters	Hyderabad	INR25 billion	Facility will have a capacity of manufacturing 200 helicopters annually and provide direct employment for 4,500 people

Note:

- The growth rate and EBIT margin are taken from the industry average
- The total project cost and other estimates are based on the benchmark of the HAL's manufacturing facility for defence helicopter plant located near Bangalore and Karnataka.
- The proposed facility, will manufacture up to 10 classes of defence helicopter including Light Combat Helicopter (LCH), Light Utility Helicopter (LUH) and Naval Multi-role Helicopters (NMRH).

Source:

<http://economictimes.indiatimes.com/news/defence/pm-narendra-modi-to-lay-foundation-of-hals-helicopter-facility-sunday-in-karnataka/articleshow/50419556.cms>
http://halindia.com/PM%20Lays%20Foundation%20Stone%20for%20HAL%E2%80%99s%20New%20Helicopter%20Manufacturing%20Facility%20at%20Tumakuru,%20Karnataka%20Promises%20More%20Support/ND__147
http://www.business-standard.com/content/b2b-manufacturing-industry/pm-lays-foundation-for-hal-s-new-helicopter-plant-in-tumkur-116010400149_1.html
 HAL Annual Report 2015-16

Approvals & Incentives



Gujarat Industrial Policy 2015

Government of Gujarat has announced an ambitious Industrial Policy, in January 2015, with the objective of creating a healthy and conducive climate for conducting business and augmenting the industrial development of the state.

Quantum of incentives

The incentives under this policy will be available to all the Talukas listed in Government Resolution dated 25/7/2016 except municipal corporation areas.

Category of Project Location (Taluka)	% of eligible fixed capital investment entitled for Incentive	% of Net VAT reimbursement to the unit	% of Net VAT to be paid to Government	Incentive period (no. of years)
1	100	90	10	10
2	80	80	20	10
3	70	70	30	10

Net VAT incentives

Net VAT incentive will be reimbursed to the industrial undertaking in one financial year will not exceed one-tenth of the total amount of eligible incentive.

Classification of the Project	Amount (in INR crore)
Ultra Mega Industrial Unit	500
Mega Industrial Unit	400
Large Industrial Unit	150
Micro, Small or Medium Industrial Unit	50

Incentives under Gujarat A&D manufacturing policy - 2016

Government of Gujarat is in the process declaring an incentive scheme for Aerospace and defence manufacturing in the State.

Incentives from Government of India (GoI)

Manufacturing and R&D activity is allowed 100% FDI on automatic route

Accelerated depreciation of 40% is available for airplanes & aero-engines resulting tax exemptions

Variety of levies such as customs duties, service tax and VAT for component manufacturing

R&D related tax deduction for expenditure incurred by a company on in-house R&D facility

Approvals and Incentives



Indicative List of Approvals

Approvals/clearance required	Department to be approached and consulted
Incorporation of company	Registrar of companies
Registration/Industrial license	Secretariat if industrial assistance (SIA) for large and medium scale industries
Allotment of land	State industrial development corporation
No objection certificate (NOC) under air and water pollution control acts	State pollution control board
Approval of construction and country planning	<ul style="list-style-type: none"> ▶ Town and country planning ▶ Municipal and local authorities ▶ Chief inspector of factories ▶ Pollution control board ▶ Electricity board
Use and storage of explosives	Chief controller of explosives
Finance	For loans higher than INR 1.5 crore, all India financial institutions like Industrial Development Bank of India (IDBI), Industrial Credit and Investment Corporation of India (ICICI), Industrial Finance Corporation of India (IFCI) etc.
Registration under state sales tax act and Central and State excise act	<ul style="list-style-type: none"> ▶ Sales tax department ▶ Central and state excise department
Code number for export and import	Regional office of director general of foreign trade
Environmental clearance	Ministry of environment, forest and climate change after conducting environment impact assessment (EIA) for any project
Facilitation for setting up project	Industries Commissioner will facilitate for state clearances required to set up project.
Hazardous waste import and export approval	Ministry of environment, forest and climate change
Exiting business	Ministry of corporate affairs

GoG has introduced single window facilitation portal for investors with undermentioned benefits:

- ▶ Centralized system to monitor applications
- ▶ User friendly and simplified application process for investors
- ▶ System for authorities and investors to check the status of applications
- ▶ Increased departmental ownership
- ▶ **The unit shall be facilitated through 'Investor Facilitation Portal' for obtaining all the necessary state approvals/ clearances - <https://www.ifpgujarat.gov.in>**

Industries & Mines Department

www.imd-gujarat.gov.in

Gujarat Industrial Development Corporation

www.gidc.gov.in

Office of Industries Commissioner

www.ic.gujarat.gov.in

Industrial Extension Bureau

www.indextb.com

This project profile is based on preliminary study to facilitate prospective entrepreneurs to assess a prima facie scope. It is, however, advisable to get a detailed feasibility study prepared before taking a final investment decision.

For further details:

INDEXTb
INDUSTRIAL EXTENSION BUREAU
(A GOVT. OF GUJARAT ORGANISATION)
ISO 9001:2015 Certified

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