



INTERNATIONAL DEFENCE COMPANIES



NOTEBOOK

2020 Edition

INTERNATIONAL DEFENCE COMPANIES

Manuscript completed on 22 November 2019

French defence procurement agency (DGA)

Industrial Affairs and Economic Intelligence Department

60 bd du général Martial Valin - CS 21 623 - 75 509 Paris cedex 15

www.defense.gouv.fr/dga

Xerfi MCI

13-15 rue de Calais - 75009 Paris

www.xerfi-mci.com

FOREWORD

Paris, November 22, 2019

The Department for Industrial Affairs and Economic Intelligence presents, on behalf of the French defence procurement agency (*Direction générale de l'armement*, DGA), the 2020 edition of the "Notebook on International Defence Companies".

This publication provides key data for a selection of international defence companies that were chosen according to their main activities.

In this regard, Almaz-Antey, Atos, Huntington Ingalls Industries, Lürssen, Rohde & Schwarz and TechnicAtome were for the first time included in this 2020 edition.

All information such as financial data, key activities and strategic orientations of the companies analysed in the Notebook were taken from publicly available, open sources.

The notebook does not in any way reflect the opinions or positions of the DGA or XERFI MCI, which contributed to its preparation.

A digital version of the notebook, both in French and in English, is available on the DGA's website at www.defense.gouv.fr/DGA

I wish you a pleasant reading.

François MESTRE
Director for Industrials Affairs and Economic Intelligence
DGA

TABLE OF CONTENTS

COMPANY FACT-SHEETS

Methodological Note	p. 6
 Airbus	p. 8
 Almaz-Antey	p. 11
 ArianeGroup (formerly Airbus Safran Launchers)	p. 14
 Arquus (formerly Renault Trucks Defense)	p. 17
 ASC Pty Ltd	p. 20
 ATOS	p. 23
 Babcock International	p. 26
 BAE Systems	p. 29
 Boeing	p. 32
 China Shipbuilding Industry Corporation (CSIC)	p. 35
 Cobham	p. 38
 Dassault Aviation	p. 41
 Diehl Defence	p. 44
 DSME	p. 47
 Elbit Systems	p. 50
 Elettronica	p. 53
 Embraer	p. 56
 Fincantieri	p. 59
 General Atomics	p. 62
 General Dynamics	p. 65
 General Electric Aviation (GE Aviation)	p. 68
 Hensoldt	p. 71
 Hindustan Aeronautics Ltd (HAL)	p. 74
 Honeywell International	p. 77
 Huntington Ingalls Industries (HII)	p. 80
 Indra Sistemas	p. 83
 Israel Aerospace Industries (IAI)	p. 86
 Iveco Defence Vehicles	p. 89
 Kawasaki Heavy Industries (KHI)	p. 92
 KMW + Nexter Defense Systems (KNDS)	p. 95
 Kongsberg	p. 98

	Korea Aerospace Industries	p. 101
	L3Harris Technologies	p. 104
	Leonardo	p. 107
	Lockheed Martin	p. 110
	Lürssen	p. 113
	MBDA	p. 116
	Meggitt	p. 119
	MTU Aero Engines	p. 122
	Nammo	p. 125
	Naval Group	p. 128
	Navantia	p. 131
	Northrop Grumman	p. 134
	OHB Technologies	p. 137
	Patria Oyj	p. 140
	Polaska Grupa Zbrojeniowa (PGZ)	p. 143
	QinetiQ	p. 146
	Rafael Advanced Defense Systems	p. 149
	Raytheon Company	p. 152
	Rheinmetall Defence	p. 155
	Rohde & Schwarz	p. 158
	Rolls-Royce	p. 161
	RUAG	p. 164
	Saab AB	p. 167
	Safran	p. 170
	Techniatome (formerly Areva TA)	p. 173
	Thales	p. 176
	Thales Alenia Space (TAS)	p. 179
	ThyssenKrupp Marine Systems (TKMS)	p. 182
	United Aircraft Corporation (UAC)	p. 185
	United Technologies Corporation (UTC)	p. 188

SCOPE

The 2020 edition of the Notebook on International Defence Companies covers a panel of 61 companies. A specific section, “Key Data”, presents the following consolidated financial indicators for each company, provided such information is available (“N/A” meaning that data is not available):

- Revenue (in euros)
- Revenue variation (as a percentage change; calculated from data in local currency)
- Defence revenue (as a % of total revenue)
- Export revenue (as a % of total revenue)
- Operating profit/loss (in euros)
- Operating margin (as a %)
- Net income (in euros) or net income attributable to shareholders
- Order book at the end of the fiscal year (in euros)
- Headcount

To ensure consistency, consolidated financial statements were the preferred source of information. Emphasis was placed on the most recent, restated financial indicators. Under the IFRS 15 standard, effective since January 2018, several financial restatements were made regarding the 2017 fiscal year. Furthermore, some data contained in the previous edition have been revised, corrected or modified for this edition in order to take into account more recent currency exchange rates (see below).

Currency conversions were calculated using the annual average exchange rate (source: European Central Bank) during each company's fiscal year. However, order book values were converted using the exchange rates at the closing date of each company's fiscal year. Average annual exchange rates used for conversions are presented in the table below. It should be noted that all financial indicators were converted using the average exchange rate for their corresponding year. To avoid a bias when calculating annual changes of monetary indicators, variations (as a percentage change) were calculated in the original currency used in each company's financial statement.

SOURCES

For publicly listed groups or those that publish annual statements of consolidated accounts, the following sources were used:

- Annual reports and reference documents
- Consolidated balance sheets and profit & loss statements
- Financial and investor presentations

For unlisted groups or those that do not publish annual statements of consolidated accounts, the following sources were used:

- Press releases
- Company presentations
- Data bases : Factiva, Diane
- Business press and specialist publications

List of companies that do not publish, or only partially publish, financial statements:

- Almaz-Antey
- ArianeGroup (formerly Airbus Safran Launchers)
- Arquus (formerly Renault Trucks Defense)
- China Shipbuilding Industry Corporation (CSIC)
- Diehl Defence
- Elettronica
- General Atomics
- Hensoldt
- Iveco Defence Vehicles
- Lürssen
- KMW + Nexter Defense Systems (KNDS)
- MBDA
- Polska Grupa Zbrojeniowa (PGZ)
- Rohde & Schwarz
- TechnicAtome (formerly Areva TAS)
- Thales Alenia Space (TAS)
- ThyssenKrupp Marine Systems (TKMS)

OWNERSHIP

The "Ownership structure" section draws data from the following sources:

- Company publications (websites, reference documents, investor presentations)
- Brokerage firms and major trading platforms (Morningstar, EDGAR, NYSE Euronext, Nasdaq, LSE, Borsa Italiana, Tokyo Stock Exchange, etc).

CHARTS

Charts represent the sales breakdown by business segment (i.e. branches or divisions as presented by the company) and geographical region.

MAIN PROGRAMMES, COOPERATIONS AND EXPORT PARTNERSHIPS

The "Main programmes, cooperations and export partnerships" section presents the main programmes highlighted by companies in their public media releases (excluding upstream study programmes). Partnerships for each programme are also listed, without further details. These partnerships can take several forms: co-contractorship, co-development or co-production agreements, subcontracting agreements (for tier-1 equipment suppliers considered as "strategic partners"), marketing agreements, joint ventures (JV), or partnerships with foreign companies as part of offset agreements.

Due to the very concise format of the notebook, this section cannot claim to be exhaustive.

EURO EXCHANGE RATES*

COUNTRY	CURRENCY	1 EURO =			
		2015	2016	2017	2018
Australia	Australian dollar	1,478	1,488	1,473	1,580
China	Yuan	6,973	7,352	7,629	7,808
South Korea	Won	1 256,54	1 284,18	1 276,74	1 299,07
USA	U.S. dollar	1,110	1,107	1,130	1,181
India	Rupee**	71,196	74,372	73,532	80,733
Japan	Yen	134,31	120,20	126,71	130,40
Norway	Krone	8,950	9,291	9,327	9,596
Poland	Zloty	4,184	4,363	4,257	4,262
United Kingdom	Pound sterling	0,726	0,819	0,877	0,885
Russia	Ruble	68,072	74,145	65,938	74,042
Sweden	Krona	9,354	9,469	9,635	10,258
Switzerland	Swiss franc	1,068	1,090	1,112	1,155

*Exchange rates used for conversions were calculated as the annual average rate from January 1 to December 31 (source: European Central Bank)

**The Indian numbering system groups the rightmost three digits together and thereafter groups digits by sets of two. To facilitate the reading of large numbers, the Indian system uses "crore". For instance, one crore rupee is equivalent to ten million (10,000,000) rupees.



BUSINESS AREAS

Platform manufacturer and systems integrator

- ▶ Commercial and military aircraft
- ▶ Commercial and military helicopters
- ▶ Unmanned aircraft systems (UAS)
- ▶ Commercial and military space (satellites, services)
- ▶ Defence electronics
- ▶ Cybersecurity

GOVERNANCE

Chairman	Denis Ranque
Chief Executive Officer	Guillaume Faury
CEO Airbus Defence & Space	Dirk Hoke

KEY FIGURES (Fiscal year ended: December 31st)

€ millions	2015	2016	2017***	2018
Revenue	64 450	66 581	59 022	63 707
Δ (%)	6,16%	3,31%	-11,35%	7,94%
Defence (%)*	18%	17%	18%	17%
Export (%)**	69%	68%	73%	72%
Operating profit/loss	4 062	2 258	2 665	5 048
Operating margin (%)	6,30%	3,39%	4,52%	7,92%
Net income****	2 696	995	2 361	3 054
Order book	1 005 864	1 060 447	996 822	459 525
Employees	136 574	133 782	129 442	133 671

* Estimated.

** Based on revenue in European markets.

*** 2017 figures restated.

**** Net income attributable to shareholders.

OWNERSHIP STRUCTURE (as of 20.11.2019)

Symbol	AIR
Listed on	NYSE Euronext
Market Cap (€m)	104 956

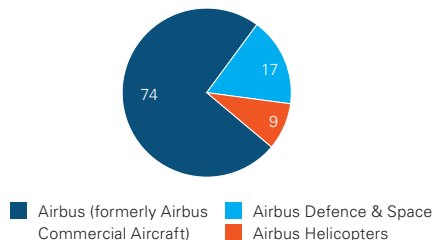
Major shareholders (as of 20.11.2019)

SOGEPA (French State)	11,03%
GZBV (German State)	11,02%
Capital Research & Management Co. (World Investors)	7,06%
SEPI (Spanish State)	4,16%

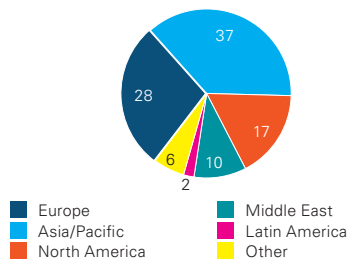
MAIN JOINT VENTURES AND ASSOCIATES

Name	%	Country
MBDA	37,5%	France
Eurofighter Jagdflugzeug GmbH	46%	Germany
ArianeGroup	50%	France
ATR	50%	France
NHIndustries	62,5%	France
AirTanker Holdings Ltd	40%	United Kingdom

REVENUE BY BUSINESS LINE (%)



REVENUE BY REGION (%)



MAIN PROGRAMMES, COOPERATIONS AND EXPORT PARTNERSHIPS

	Thales	BAE Systems	Northrop Grumman*	Leonardo	Safran	Dassault Aviation	TAI	Naval Group	Gemalto**	Rolls-Royce
Military aircraft and Unmanned aircraft systems										
A400M tactical and strategic military transport aircraft	●			●		●				
C295 and AC295 tactical transport aircraft	●	●								
A330 Multi Role Tanker Transport (MRTT) aircraft	●									●
A320neo MPA (Maritime Patrol Aircraft)	●			●						
Eurofighter Typhoon fighter aircraft		●		●						●
European MALE RPAS				●		●				
VSR700 shipborne UAV	●			●			●			
NGWS fighter aircraft (FCAS programme)	●			●	●					
Military helicopters										
H125 single-engine helicopter (2t)	●			●						
H135 and H145M twin-engine helicopters (3t)	●			●						
AS565 Mbe (4t) and H160M (6t) twin-engine multi-role helicopters	●			●						
H215M (9t) and H225M (11t) twin-engine multi-role helicopters	●			●						
NH90 twin-engine multi-role helicopter (11t)	●		●	●						
Tiger HAP / HAD attack helicopter (6t)	●			●						
Space										
CSO optical earth observation satellite	●									
CERES space-born military intelligence system	●									
Syracuse 4 military communication satellite	●		●							
Cybersecurity										
Stormshield Data Security									●	

*Innovation Systems division, formerly Orbital ATK **Thales group

STRATEGIC HIGHLIGHTS

Business trends

- ▶ Airbus is a European aerospace corporation and one of the world's leading companies in the commercial aviation and defence sectors. Its activities are organised around 3 divisions: Airbus (commercial aircraft, formerly Airbus Commercial Aircraft), Airbus Defence & Space (military aircraft, UAVs, space launchers and satellites), and Airbus Helicopters.
- ▶ The group's consolidated revenue reached €63.7bn in 2018, up nearly 8% year-on-year, thanks in particular to a record number of commercial aircraft deliveries (800 units, compared with 718 in 2017), but also deliveries of Typhoon (Oman) and A400M Atlas (17 units) aircraft.
- ▶ The Airbus Defence & Space division's order book reached €35.3bn at the end of 2018, representing just over 3 years of revenue. Among the units to be produced are 58 Typhoon fighter aircraft and 100 A400M Atlas transport aircraft.
- ▶ Airbus Helicopters announced it would recruit 200 employees at its Marignane site in 2019, of which 100 dedicated to R&D, 60 to assembly lines and 40 to new technologies. The recruitment campaign follows a previous initiative of 2018 for the creation of 200 new positions at the site, after years of declining workforce.
- ▶ Faced with cash flow problems, the Airbus Defence & Space division in late 2019 launched the Momentum efficiency plan aimed at improving its long-term operational performance.

Home markets (Germany, Spain, France, United Kingdom)

- ▶ As announced in the French military programming law for the 2019-2025 period, France's defence procurement agency (DGA) ordered three additional A330 MRTT multi-role tanker transport aircraft from Airbus as part of the third and final tranche of a multi-year contract signed in 2014.
- ▶ Germany ordered 33 Typhoon fighter aircraft from the Eurofighter GmbH consortium to replace the Tranche 1 Typhoon aircraft delivered between 2003 and 2008. The value of the contract is estimated at €3.3bn. Part of manufacturing activities will be carried out in Augsburg, with final assembly to be handled in nearby Manching.
- ▶ In February 2019, the French and German Defence Ministers awarded Airbus and Dassault Aviation a €65m contract (equally financed by France and Germany) for a Joint Concept Study to identify the technical needs and assess the feasibility of the future European NGWS fighter aircraft, as part of Future Combat Air System (FCAS) programme.

Export markets

- ▶ In late 2018, Qatar confirmed a contract to purchase 24 Typhoon fighter aircraft for a total value of nearly €7bn. The contract also includes fleet support, delivery of spare equipment, as well as the training of Qatari pilots.
- ▶ In February 2019, PT Dirgantara Indonesia, Airbus Helicopters' partner in Indonesia, signed a contract with the Indonesian Ministry of Defence for the supply of eight H225M Caracal helicopters.
- ▶ The support services contract for 22 Australian Tiger attack helicopters was extended until 2025 for an estimated amount of AUD\$ 790m (approximately €490m). Airbus Helicopters will carry out operational maintenance of the aircraft and training of crews and technicians.

Technology and Innovation

- ▶ After several years of decline, Airbus' R&D spending rose again in 2018. R&D expenses reached €3.2bn, compared with €2.8bn in 2017, mainly as a result of the development of the A320 programme.
- ▶ In May 2019, Airbus Helicopters presented a full-scale model of the Guépard, a military variant of the H160 medium utility helicopter. This variant will be the next Joint Light Helicopter of France's HIL programme, which will be launched in 2021 by the Ministry of the Armed Forces and includes a planned order for 169 helicopters. The first units could be delivered in 2026.



BUSINESS AREAS

Platform manufacturer and systems integrator

- ▶ Air defence systems
- ▶ Ground control stations
- ▶ Military vehicles
- ▶ Radars

GOVERNANCE

Chairman

M.E. Fradkov

Chief Executive Officer

J.V. Novikov

KEY FIGURES

€ millions	2015	2016	2017	2018
Revenue	N/A	N/A	N/A	~8 400
Δ (%)	N/A	N/A	N/A	N/A
Defence (%)	N/A	N/A	N/A	N/A
Export (%)	N/A	N/A	N/A	N/A
Operating profit/loss	N/A	N/A	N/A	N/A
Operating margin (%)	N/A	N/A	N/A	N/A
Net income	N/A	N/A	N/A	N/A
Order book	N/A	N/A	N/A	N/A
Employees	N/A	N/A	N/A	~129 000

OWNERSHIP STRUCTURE

Symbol

Listed on

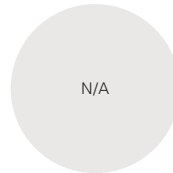
Unlisted group

Market Cap

Major shareholders (as of 20.11.2019) %

Russian State | 100%

REVENUE BY BUSINESS LINE (%)



MAIN JOINT VENTURES AND ASSOCIATES*

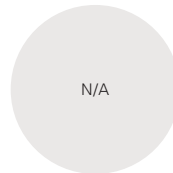
Name

%

Country

Name	%	Country

REVENUE BY REGION (%)



*No information available.

MAIN PROGRAMMES, COOPERATIONS AND EXPORT PARTNERSHIPS

	GAZ Group (Russia)	ADD*	High Precision Systems**	MZKT (Belarus)
Air defence systems				
S-350 Vityaz short-to-mid range surface-to-air defence missile system		●		
S-400 Triumph long-range surface-to-air defence missile system	●			
S-500 Prometheus long-range surface-to-air defence missile system				
Tor-M2/M2E, Tor-M2K and Tor-M2DT short-range surface-to-air defence missile systems				
Buk-M3/M3E Viking medium-range surface-to-air defence missile system				
Pantsir medium-range surface-to-air defence missile system			●	
Ground control stations				
Baikal, PPRU, Fundament, Universal and KTE control systems				
Military vehicles				
Air defence ground-based platforms				●
Radars				
Land and maritime monitoring radars				
Struna-1/Barrier-E bistatic radar system				

*Agency for Defense Development (South Korea)

**Russian Rostec conglomerate

STRATEGIC HIGHLIGHTS

Business trends

- ▶ Almaz-Antey, Russia's leading defence contractor with a turnover of nearly \$10bn (€8.4bn) in 2018 and around 129,000 employees, is a state-owned defence conglomerate founded in 2002 and comprising some sixty companies (including missile producer Avangard and military vehicle manufacturer BAZ), enabling it to produce all the equipment and systems (missiles, radars, land platforms) for its ground-to-air defence systems.
- ▶ Almaz-Antey mostly operates in the defence sector but is also involved in civil activities (less than 10% of its turnover) and dual activities, an area of diversification that the group aims to pursue.
- ▶ To strengthen its industrial capacities, Almaz-Antey has built two new plants, in Kirov and Nizhny Novgorod, in particular to produce the new S-500 long-range surface-to-air anti-ballistic missile system. The investment in these new facilities as well as an industrial site including an innovation centre in St Petersburg amounted to approximately RUB 120bn (€1.5bn).

Home market

- ▶ A major supplier to the Russian Army, Almaz-Antey continues to supply S-400 long-range surface-to-air defence missile systems, 56 units of which are due to be delivered by 2020 (two units still to be delivered). The 2018-2027 weapons programme also includes the Russian Army's acquisition of S-350 and S-500 short-to medium-range air defence and anti-missile systems.
- ▶ In 2019, Almaz-Antey completed testing of the S-500 defence system, designed to counter ballistic missiles and stealth aircraft. The first units are expected to be delivered in 2020.
- ▶ In 2019, Almaz-Antey launched serial production of the S-350 short-range air defence and anti-missile system, which is derived from the S-400 and had been in development for 10 years. Less expensive than the S-400 and S-500, the S-350 is intended for the Russian Army (possible acquisition of 20 to 30 units) and for export markets.
- ▶ In September 2019, the Russian Ministry of Defence signed a contract worth around RUB 100bn (€1.4bn) with Almaz-Antey for the acquisition of Tor-M2 and Tor-M2DT short-range air defence and surface-to-air missile systems, to be delivered by 2027.

Export markets

- ▶ Almaz-Antey, Russia's leading arms exporter, generates about half of its defence turnover from exports. It has more than 50 client countries, in particular in Asia, Latin America and the Middle East.
- ▶ China, the S-400's first export customer, in 2018 received the first systems ordered in 2014 for around \$3bn (€2.3bn). Almaz-Antey also confirmed the delivery, between 2020 and 2023, of the five S-400 defence systems ordered by India in October 2018 for \$5.4bn (€4.6bn). Qatar also expressed interest in the S-400.
- ▶ In 2019, the group announced it was in negotiations with various foreign countries for the sale of the Buk-M3E medium-range (export version of the Buk-M3) and Tor-M2E short-range (export version of the Tor-M2) air defence and surface-to-air anti-missile systems.
- ▶ In the summer of 2019, Almaz-Antey delivered the S-400 defence systems ordered by Turkey in 2017 for approximately \$2.5bn (€2.2bn). Turkey expressed its interest in joint production, with Russia, of the S-500 defence system.
- ▶ In September 2019, the group signed a contract with Belarus for the maintenance and modernisation of the S-300 and Tor-M2K defence systems.

Technology and Innovation

- ▶ In March 2019, Almaz-Antey unveiled a mini-UAV equipped with a Kalashnikov AK-47.

BUSINESS AREAS

Platform manufacturer and systems integrator

- ▶ Commercial launch services (launchers and services)
- ▶ Ballistic missiles
- ▶ Propulsion systems
- ▶ Pyrotechnics (for launchers and satellites)
- ▶ Space instrumentation and equipment (optical, optronic, neutronic)
- ▶ Complex and secure infrastructures

GOVERNANCE

Chairman and CEO
Chief Operating Officer
Defence Programmes
Director

André-Hubert Roussel
David Quancard
Philippe Clar

OWNERSHIP STRUCTURE

Symbol
Listed on Unlisted group
Market Cap

Major shareholders (as of 20.11.2019)

Airbus	50%
Safran	50%

MAIN JOINT VENTURES AND ASSOCIATES

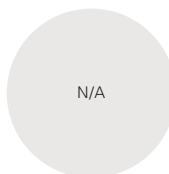
Name	%	Country
Arianespace	74%	France
Nucléutudes	98,9%	France
CILAS	63%	France
Pyroalliance	90%	France
Sodern	90%	France
EuroCryospace	45%	France
Europropulsion	50%	France
Regulus	40%	France

KEY FIGURES (Fiscal year ended: December 31st)

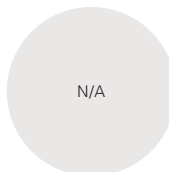
€ millions	2015	2016*	2017	2018
Revenue	1 215	2 227	3 221	3 587
Δ (%)	N/A	83,29%	44,63%	11,36%
Defence (%)	N/A	N/A	N/A	N/A
Export (%)	N/A	N/A	N/A	N/A
Operating profit/loss	-8	102	228	251
Operating margin (%)	-0,66%	4,58%	7,08%	7,00%
Net income**	-8	98	266	237
Order book	N/A	N/A	N/A	N/A
Employees	-	~9 000	~9 000	~9 000

*Changes in scope since 2016.
**Total comprehensive income.

REVENUE BY BUSINESS LINE (%)



REVENUE BY REGION (%)



ARIANEGROUP (FORMERLY AIRBUS SAFRAN LAUNCHERS)

MAIN PROGRAMMES, COOPERATIONS AND EXPORT PARTNERSHIPS

	Airbus	Safran	Thales	Naval Group	Avio	RJAG	MT Aerospace*	SABCA	Air Liquide
Commercial launch services									
Ariane 6 new-generation launcher (2020)	●	●	●			●	●	●	●
Ariane 5 launcher	●	●	●			●	●	●	●
Launch services (Ariane 5, Vega, Soyouz)									
Ballistic missile									
M51 missile	●	●	●	●					
Propulsion systems									
Vulcain 2 (Ariane 5) and Vulcain 2.1 (Ariane 6) rocket engines		●							
Vinci rocket engine (Ariane 5ME)		●							
P120C rocket engine (Ariane 6, Vega-C)					●				
Prometheus rocket engine project	●	●							
Bipropellant thrusters (4N, 10N, 22N, 200N, 400N)									
Chemical monopropellant hydrazine thrusters (1N, 20N, 400N)									
Electric orbital propulsion systems (RIT 2X, RIT 10 EVO and RIT μX)									
M10 release and separation nuts (ME0032, ME0038)									
Combustion chambers									
Metallic container									
Pyrotechnics (for launchers and satellites)									
Vulcain Turbine pump starter		●							
Vinci engine ignition system		●							
Vega's Zefiro-9 third-stage engine ignition system					●				

*OHB group

STRATEGIC HIGHLIGHTS

Business trends

- ▶ As part of the reorganisation of the European space launcher industry, Airbus Safran Launchers on July 1, 2017 became ArianeGroup, a joint venture owned in equal parts by Airbus and Safran. The group's seven subsidiaries adopt the same graphic identity.
- ▶ ArianeGroup announced a turnover of €3.6bn in 2018 (+11% year-on-year) and around 9,000 employees based in France (9 sites, including one in French Guiana) and Germany (4 sites).
- ▶ In 2018, Arianespace successfully launched 11 satellites (including one for France's defence procurement agency) and put 21 satellites into orbit (including 4 Galileo satellites via the Ariane 5 launcher). From January to September 2019, seven launches were made, including three with Ariane 5, and 17 satellites were put into orbit.
- ▶ As of January 1, 2019, André-Hubert Roussel, previously Chief Operating Officer of Airbus Defence & Space, became President of ArianeGroup in place of Alain Charmeau, who was the head of Airbus Safran Launchers and ArianeGroup since 2014.
- ▶ By 2022, ArianeGroup plans to cut 2,300 positions among its own workforce and subcontractors (without resorting to layoffs). The group aims to improve its competitiveness in a context of a declining satellite launch market and strong competition, particularly from U.S.-based private space transportation company SpaceX.

Home market

- ▶ The group is involved in the renewal of France's defence satellite capacity. In December 2018, Arianespace launched the CSO-1 military observation satellite, the first of a constellation of three new-generation satellites (Optical Space Component, or CSO) ordered by the Ministry of the Armed Forces as part of the Multinational Space-based Imaging System (MUSIS) programme led by the French defence procurement agency (DGA). The National Centre for Space Studies (CNES) is in charge of leading the development of the CSO satellites, which will be dedicated to reconnaissance and identification missions. The CSO-2 and CSO-3 satellites are scheduled to be launched in 2020 and 2021.
- ▶ In January 2019, ArianeGroup announced the success of the second test firing for the P120C solid rocket engine at the European Spaceport in Kourou, French Guiana. The engine, which was developed by Europropulsion, a 50:50 joint venture of ArianeGroup and Avio, will power the boosters of the Ariane 62 and Ariane 64 launchers as well as the first stage of the Vega-C launcher.
- ▶ In May 2019, ArianeGroup and MT Aerospace signed 2 contracts with the European Space Agency (ESA) to design and test the Prototype of a Highly Optimized Black Upper Stage (PHOEBUS). The project should pave the way for the development of the new upper stage of Ariane 6 Evolution, called Icarus (Innovative Carbon Ariane Upper Stage).
- ▶ At the same time, the group launched the production of the first series-production batch of 14 Ariane 6 launchers, which are scheduled to fly between 2021 and 2023. A few months later, the European Space Agency (ESA), ArianeGroup and Arianespace, adopted the detailed design review of the Ariane 6 launcher, whose inaugural flight is scheduled for the second half of 2020. ESA is expected to finalise seven orders by the end of the year, or failing that, to fund the revenues needed by the manufacturers.

Technology and Innovation

- ▶ In February 2019, ArianeGroup and CNES, joined by ONERA, launched the ArianeWorks acceleration platform to prepare the development of future launchers with the participation of start-ups, laboratories and manufacturers.
- ▶ In mid-2019, ArianeGroup entered into a partnership with German start-up PTScientists, with the aim of overseeing future collaborations on topics related to space transport, particularly towards the orbit and surface of the Moon. The two partners are already cooperating on the preliminary study of a lunar lander mission that would launch by 2025, which was awarded to them by the European Space Agency.

BUSINESS AREAS

Platform manufacturer and systems integrator
Defence subsidiary of Volvo Group

- ▶ Wheeled armoured vehicles
- ▶ Tactical and logistics vehicles
- ▶ Propulsion systems for armoured vehicles
- ▶ Weapon systems
(Remote control weapon system, RCWS)
- ▶ Maintenance and modernisation

GOVERNANCE

Chairman and CEO

Emmanuel Levacher

Chief Financial Officer

Christian Cusset

KEY FIGURES (Fiscal year ended: December 31st)

€ millions	2015	2016	2017	2018*
Revenue	~400	~410	~400	~500
Δ (%)	5,26%	2,50%	-2,44%	25,00%
Defence (%)	100%	100%	100%	100%
Export (%)	~32%	N/A	N/A	N/A
Operating profit/loss	N/A	N/A	N/A	N/A
Operating margin (%)	N/A	N/A	N/A	N/A
Net income	N/A	N/A	N/A	N/A
Order book	N/A	N/A	N/A	6 000
Employees	~ 1 200	~ 1 400	~ 1 500	~ 1 500

*Pro forma figures.

OWNERSHIP STRUCTURE

Symbol

Listed on

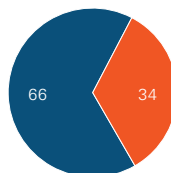
Unlisted subsidiary

Market Cap

Major shareholders (as of 20.11.2019)

Volvo Group Government Sales | 100%

REVENUE BY BUSINESS LINE (%)



■ Platform development and Production
■ Services and MRO

MAIN JOINT VENTURES AND ASSOCIATES

Name	%	Country
SOFEMA	4%	France
ODAS	2%	France

REVENUE BY REGION (%)



ARQUUS (FORMERLY RENAULT TRUCKS DEFENSE)

MAIN PROGRAMMES, COOPERATIONS AND EXPORT PARTNERSHIPS

	Nexter*	Thales	Astralis	Metravib**	AM General
Reconnaissance vehicles					
4x4 VBL Mk2 light armoured vehicle		●			
4x4 VBR light armoured vehicle					
4x4 PVP light protected vehicle					
4x4 Scarabée light armoured vehicle					
4x4 Dagger autonomous light armoured vehicle					
Armoured combat and transport vehicles					
6x6 Jaguar reconnaissance and combat armoured vehicle (EBRC) and 6x6 Griffon multi-role armoured vehicle (VBMR) (Scorpion and CalMo programmes)	●	●		●	
Maintenance for VAB armoured personnel vehicle					
6x6 VAB Mk3 armoured vehicle		●			
Higuard MRAP (armoured vehicle resistant to improvised explosive devices)					
Bastion (Fortress) armoured vehicle					●
8x8 VBCI armoured infantry fighting vehicle	●				
Light tactical vehicles					
4x4 VLRA, Sherpa Light and ALTV					
VLTP NP light utility vehicle					
Heavy tactical and logistics trucks					
4x4 / 6x6 / 8x4 / 8x8 KERAX					
4x4 / 6x6 Sherpa Medium					
6x6 Armis	●				
Special forces vehicles					
Areg, Torpedo, Sabre, PATSAS special forces vehicles					

*KNDS group **ACOEM group

STRATEGIC HIGHLIGHTS

Business trends

- ▶ A subsidiary of Sweden's Volvo group, Renault Trucks Defense (RTD) was renamed Arquus in May 2018. The change occurred after Volvo in late 2017 abandoned a project to sell its Government Sales division (which mainly included RTD), as the takeover bids - valuing RTD at around €500m - were considered insufficient.
- ▶ Arquus' order intake reached €1.27bn in 2018, including €700m in firm orders. The order book stood at €6bn at the end of the year.
- ▶ At the end of 2018, Arquus inaugurated a new €7m logistics centre in Fourchambault, central France. The centre, named Hub Arquus, is designed to supply spare parts to partners involved in the Scorpion programme.
- ▶ In September 2019, Arquus sold its Saint-Germain-Laval site to Jogam, a precision engineering subcontractor and one of Arquus' suppliers. The sale came as Arquus aims to streamline its operations by concentrating its activities on a smaller number of industrial sites. The operation will not affect the overall size of the group due to the simultaneous expansion of other sites, such as Fourchambault.

Home market

- ▶ Together with Nexter (KNDS) and Thales, Arquus is a member of the temporary consortium of companies in charge of the French Army's Scorpion modernisation programme (which includes the delivery of 110 EBRC Jaguar and 780 VBMR Griffon by 2025). Unlike Nexter, however, Arquus is not, at this stage, involved in the programme for the future French-German Main Ground Combat System (MGCS) tank, which also involves Germany's KMW and Rheinmetall.
- ▶ The three service and logistics support contracts for armoured personnel carriers (VAB vehicles), tactical trucks and vehicles developed and produced by Panhard, an Arquus subsidiary, were renewed for a period of 8 to 10 years.
- ▶ In September 2018, France's defence procurement agency (DGA) awarded Arquus a contract for 1,200 VLTP NP (Unprotected Multipurpose Light Tactical Vehicles), known as VT4 (4x4 Tactical Vehicles), to replace the P4 off-road light vehicles. The order is part of a larger contract awarded by the DGA at the end of 2016. A total of 3,700 VT4 vehicles are expected to be delivered to the French Army by 2025, including 800 in 2019.

Export markets

- ▶ Arquus has customers in more than 65 countries. The group aims to increase its export order intake (which amounted to approximately €580m in 2018) and raise the share of international sales to about half of its total revenue.
- ▶ Countries in Africa and the Middle East are among Arquus' main target clients. The group won contracts with Senegal in 2017 (13 PVP tanks and 9 Bastion tanks), Kuwait in 2018 (300 Sherpa tanks) and the Joint Force of the West African G5 Sahel in 2019 (84 tactical trucks).
- ▶ In June 2019, Arquus, Nexter and Thales were awarded a €1.6bn contract as part of the French-Belgian CaMo (Motorised Capacity) programme to modernise Belgian land mobility capacities. The contract provides for the supply of 442 armoured vehicles from 2025, including 60 Jaguar and 382 Griffon.

Technology and Innovation

- ▶ Arquus invests about 4% of its annual turnover (approximately €20m) in R&D. The company is in particular working on the development of fully autonomous vehicles (e. g. the new version of the Dagger light-armoured vehicle).
- ▶ After unveiling a prototype in June 2018, Arquus in June 2019 presented Scarabée, its new wheeled light armoured vehicle, at the Paris Air Show. The vehicle will be used for reconnaissance, support or engagement assistance missions.

**BUSINESS AREAS**

Platform manufacturer and systems integrator

- ▶ Submarines
- ▶ Surface ships
- ▶ Maintenance
- ▶ Training

GOVERNANCE

Chairman	Bruce Carter
Chief Executive Officer	Stuart Whiley
Chief Financial Officer	Ashley Menadue

KEY FIGURES (Fiscal year ended: June 30th)

€ millions	2014-15	2015-16	2016-17	2017-18
Revenue	717	525	561	497
Δ (%) / [AUD]*	12,08%	-22,18%	1,29%	-5,68%
Defence (%)	100%	100%	100%	100%
Export (%)	0%	0%	0%	0%
Operating profit/loss	20	23	27	27
Operating margin (%)	2,74%	4,32%	4,82%	5,46%
Net income	15	17	20	21
Order book	N/A	N/A	N/A	N/A
Employees	~2 600	~2 600	~2 400	~2 400

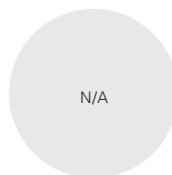
*Variation based on revenue in local currency.
See €/AUD p.7

OWNERSHIP STRUCTURE

Symbol	
Listed on	Unlisted group
Market Cap	

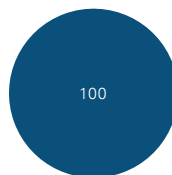
Major shareholders (as of 20.11.2019)

Australian State	100%
------------------	------

REVENUE BY BUSINESS LINE (%)**MAIN JOINT VENTURES AND ASSOCIATES***

Name	%	Country

*No information available.

REVENUE BY REGION (%)

■ Oceania

MAIN PROGRAMMES, COOPERATIONS AND EXPORT PARTNERSHIPS

	General Dynamics	Raytheon	Babcock International	Naval Group	Lockheed Martin	Forçacs Marine & Defence Ptyd*	BAE Systems	L3Harris Technologies**	Navantia	Lürssen	Austal	Saab AB	Penske
Submarines													
Attack-class conventionally-powered attack submarine (SSK)			●	●									
Surface ships													
Hobart-class Air Warfare Destroyer (AWD programme)***	●	●		●			●						
Hunter-class frigate (SEA 5000 programme)****				●	●				●				
Arafura-class OPV (SEA 1180 programme)					●		●	●			●	●	
MRO, training and support													
Collins-class submarine maintenance and training	●	●										●	
Swedish Royal Navy's A26 Blekinge-class submarine services (engineering, design)												●	

*Cimtec groupe

**Merger of L3 Technologies and Harris Corporation

***Based on F-100-class frigate (Spanish Navy)

****Based on Type 26 frigate (Royal Navy)

STRATEGIC HIGHLIGHTS

Business trends

- ▶ ASC Pty Ltd, Australia's largest naval defence group, is a wholly state-owned shipbuilding company that exclusively operates for the Australian State. A key player in the sector, ASC participates, in partnership with foreign groups, in the main Australian naval programmes: construction and maintenance of Collins-class conventionally-powered submarines, Hobart-class destroyers, Arafura-class offshore patrol vessels, and Hunter-class frigates.
- ▶ ASC's turnover fell 5.7% to AUD\$ 765m (€497m) during fiscal year 2017/2018. Nevertheless, operating income continued to improve, reaching AUD\$ 42m (€27m) for the year. Operating margin stood at 5.5%, compared with 2.7% three years earlier, mainly due to the reduction in the workforce at the Osborne site (Adelaide) and productivity gains achieved on the Hobart-class air warfare destroyer (AWD) programme.

Home market

- ▶ A key player in the Australian naval sector, ASC is the major beneficiary of the Australian Navy's AUD\$ 89bn (€60bn) modernisation programme launched in 2015 to upgrade its fleet.
- ▶ In August 2018, the Royal Australian Navy renewed its contract with ASC to train its naval forces in conventionally-powered Collins-class submarines. The training will take place at the Submarine Training and Systems Centre of the Stirling Naval Base located in Stirling, Western Australia.
- ▶ In November 2018, ASC signed an agreement with Sweden's Saab AB for the supply of engineering services for the A26 Blekinge-class conventionally-powered submarines (SSK) ordered by the Swedish Royal Navy from the Saab Kockums subsidiary. Services will be provided at the Osborne site. If successful, the agreement could be extended to other Saab AB programmes.
- ▶ At the end of 2018, ASC Shipbuilding officially became a subsidiary of BAE Systems for the duration of the construction of the nine Hunter-class anti-submarine warfare frigates (SEA 5000 programme, a contract estimated at AUD\$ 35bn, or about €24bn), for which the British group is the prime contractor. The Australian government retains shares in the shipyard and will recover the entire capital at the end of the programme. The frigates' construction is expected to begin in 2020, with commissioning scheduled a decade later.
- ▶ In February 2019, Naval Group signed a strategic partnership agreement with the Australian government to supply 12 Attack-class conventionally-powered submarines (SEA 1000 programme), based on its Suffren-class nuclear-powered submarines (SSN) programme (Barracuda programme) in its conventional variant. The construction of the vessels will be carried out in Australia by ASC at the Osborne shipyard (Adelaide) as part of a technology transfer agreement.
- ▶ In May 2019, the keel was laid at the Osborne shipyard for the first of the 12 new offshore patrol vessels ordered by the Royal Australian Navy (SEA 1180 programme, of which Luerssen Australia is the prime contractor and ASC and Cvmec are first-tier subcontractors). Named Arafura, it is scheduled to be delivered in 2021. ASC is in charge of the construction of the first two units, while the following 10 will be built on the Cvmec site in Henderson from 2020.

Technology and Innovation

- ▶ In September 2018, ASC and Defence Science and Technology (DST), an agency which is part of the Australian Department of Defence, signed a new cooperation agreement dedicated to innovation in the submarine segment. The partnership includes the areas of design, materials, and hydrodynamics, among others.
- ▶ During the Pacific 2019 naval show, ASC and French electric and mechanical engineering company Jeumont Electric (partner of Naval Group to provide propulsion systems for Attack-class submarines), teamed up for the development of new submarine technologies.



BUSINESS AREAS

IT solutions supplier and systems integrator

- ▶ IT services and digital transformation consulting
- ▶ Big Data and HPC (High Performance Computing) solutions
- ▶ Tactical communication systems
- ▶ Command, Control and Surveillance systems
- ▶ Electronic systems (navigation instruments, defence electronics)
- ▶ Cybersecurity

GOVERNANCE

Chairman Bertrand Meunier
 Chief Executive Officer Elie Girard
 Head of Big Data & Security Division Pierre Barnabé

OWNERSHIP STRUCTURE (as of 20.11.2019)

Symbol	ATO
Listed on	NYSE Euronext Paris
Market Cap (€m)	7 917

Major shareholders (as of 20.11.2019)

Siemens Aktiengesellschaft	11,40%
Fidelity Management & Research Co.	3,06%
The Vanguard Group, Inc.	2,44%
DWS Investments (UK) Ltd.	2,20%
Norges Bank Investment Management	2,16%

MAIN JOINT VENTURES AND ASSOCIATES

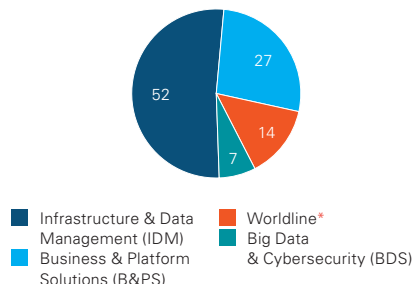
Name	%	Country
Worldline	13%	France
Atos Saudi LLC	49%	Saudi Arabia

KEY FIGURES (Fiscal year ended: December 31st)

€ millions	2015	2016*	2017*	2018
Revenue	10 686	12 138	11 996	12 258
Δ (%)	18,06%	13,59%	-1,17%	2,18%
Defence (%)	>10%	>10%	>10%	>10%
Export (%)	N/A	N/A	N/A	N/A
Operating profit/loss	589	827	875	836
Operating margin (%)	5,51%	6,81%	7,29%	6,82%
Net income**	406	579	301	630
Order book	19 118	21 385	22 700	24 500
Employees***	91 322	100 096	97 267	122 110

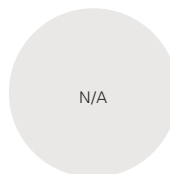
*2016 and 2017 figures restated.
 **Net income attributable to shareholders.
 ***Including "indirect employees".

REVENUE BY BUSINESS LINE (%)



*Since May 2019 and the distribution in kind to shareholders of more than 23% of Worldline's share capital (followed by a further sale of assets in November 2019), which completed the spin-off of Atos into two independent listed entities, Worldline is no longer a division of the group.

REVENUE BY REGION (%)



MAIN PROGRAMMES, COOPERATIONS AND EXPORT PARTNERSHIPS

	Cappgemini	CEA	Thales Alenia Space	T-Systems	Nexter	Arquus
Big Data and HPC (High Performance Computing) solutions						
Artemis programme (second phase)	●	●				
BullSequana supercomputers						
Copernicus Data and Information Access Services (DIAS) (Copernicus programme)			●	●		
Tactical communication systems						
Hoox for Mission tactical 4G/LTE communication solution for intervention forces						
Auxylium tactical LTE communication solution						
Command, Control and Surveillance systems						
Bull Battle Management System (SCORPION Combat Information System)					●	●
CENTINELA checkpoint solution						
VIGIA border monitoring						
Electronic navigation equipment						
LMN electromagnetic speed log*						
Multi-fonction repeater for surface ships (MFR6, MFR12) and submarines (MFR6 WP)						
Defence electronics						
ELINT/R-ESM systems family (ELIT, OSCAR, CARACAL)						
COMINT/C-ESM systems family (FlashHawk)						
Shadow jammers family (Raid Shadow, Black Shadow)						
Cybersecurity						
Data encryption solutions (Trustway, Trustway Chronos)						

*The LMN6, a new generation of electromagnetic speed log, has been chosen by the French Navy to equip its ships, such as La Fayette-class frigates, Horizon-class frigates, surveillance frigates and mine-hunting vessels.

STRATEGIC HIGHLIGHTS

Business trends

- ▶ Atos is a French information technology (IT) services company. The firm entered the defence market through the 2014 acquisition of computer and IT services company Bull, owner, among others, of the BEN Marine brand (LMN electromagnetic speed log measuring instruments, MFR repeaters, etc.) as well as of Avantix (formerly Amesys, specialised in ELINT, COMINT, and jammer systems) and Evidian, a provider of security, identity, and access management solutions.
- ▶ Atos' revenue reached €12.3bn in 2018, up 2.2% year-on-year. The weight of defence activities in total revenue remains below 10%.
- ▶ Following a failed attempt to acquire Gemalto (eventually purchased by Thales), Atos in October 2018 completed the acquisition of U.S. digital services and data processing company Syntel for \$3.4bn (€2.9bn). Syntel, which had revenue of €924m (€815m) in 2017, of which nearly 90% in North America, is now part of the Business & Platform Solutions division.
- ▶ In May 2019, Atos implemented the distribution in kind of more than 23% of the share capital of Worldline, a provider of payment services, to its own shareholders, completing the spin-off of the company which began with Worldline's initial public offering in 2014. Following the divestment, which marks Atos' exit from the payment services market, the group reorganised its operations into 3 divisions, compared to 4 before.

Home market

- ▶ Atos is involved in the French Army's SCORPION programme. The Bull BMS system, launched in 2016, is among the solutions integrated into the SCORPION Combat Information System (SICS) of the programme's three new armoured vehicles: the Jaguar, the Griffon and the Serval.
- ▶ Atos' new generation of LMN6 electromagnetic speed logs (BEN Marine range) will be used on light stealth frigates (FLF), Horizon-class frigates, surveillance frigates and mine-hunting vessels of the French Navy.
- ▶ In late 2018, the French Alternative Energies and Atomic Energy Commission (CEA) acquired a BullSequana X1310 supercomputer (for an undisclosed amount), Atos' first supercomputer based on Arm technology. The supercomputer is the result of the Mont-Blanc 3 project, funded by the European Commission.
- ▶ In May 2019, a partnership between Atos, Capgemini and CEA was selected to participate in the second phase of the French defence procurement agency's (DGA) Artemis programme, which involves the supply of a Big Data platform demonstrator.

Export markets

- ▶ Atos is a contractor of many international institutions, including NATO. Since the end of 2018, for example, an agreement on regular exchanges of information on cybersecurity and potential cyber threats has linked the French company with NATO's communication and information agency, which is responsible for operating and protecting the organisation's networks. These exchanges should enable both sides to improve their capacities in terms of prevention, detection and response to threats.
- ▶ In October 2018, Airbus Cybersecurity, the cybersecurity division of Airbus Defence & Space, and Atos signed a six-year framework contract (financial details were undisclosed) with the Council of the European Union to implement a coordinated cybersecurity solution on the IT systems of 17 EU institutions, services and agencies. Airbus Cybersecurity is the prime contractor for the programme, with Atos acting as second prime contractor.

Technology and Innovation

- ▶ Atos devotes an annual budget of approximately €300m to R&D, representing 2.5% of its revenue.
- ▶ Since April 2018, Atos and Google Cloud have been global partners in the field of artificial intelligence (AI). Three dedicated AI laboratories have recently been inaugurated, including one in Bezons (northwest of Paris).



BUSINESS AREAS

Engineering support services company and systems integrator

- ▶ Engineering support services, production and integration of equipment (naval and land)
- ▶ Naval MRO, support and services
- ▶ Airbase and naval base support and management
- ▶ Outsourcing contracts (training, fleet management service)

GOVERNANCE

Chairwoman

Ruth Cairnie

Chief Executive Officer

Archie Bethel

CEO Marine

John Howie

OWNERSHIP STRUCTURE (as of 20.11.2019)

Symbol	BAB
Listed on	LSE
Market Cap (€m)	2 754

Major shareholders (as of 20.11.2019)

Invesco Asset Management Ltd.	9,93%
Jupiter Asset Management Ltd.	5,38%
DWS Investment GmbH	5,06%
Polaris Capital Management LLC	5,01%

MAIN JOINT VENTURES AND ASSOCIATES

Name	%	Country
Holdfast Training Services Ltd	74%	United Kingdom
Ascent Flight Training (Holdings) Ltd	50%	United Kingdom
AirTanker Services Ltd	22%	United Kingdom
ALC (Superholdco) Ltd	50%	United Kingdom
Naval Ship Management (Australia) Pty Ltd	50%	Australia
Duqm Naval Dockyard SAOC	49%	Oman

KEY FIGURES (Fiscal year ended: March 31st)

€ millions	2015-16	2016-17	2017-18	2018-19
Revenue *	5 681	5 407	5 277	5 073
Δ (%) [E]**	4,05%	9,35%	2,47%	-3,97%
Defence (%)	46%	48%	47%	46%
Export (%)	21%	25%	32%	34%
Operating profit/loss*	482	428	420	223
Operating margin (%)*	8,48%	7,91%	7,95%	4,39%
Net income ***	392	371	381	226
Order book	25 253	22 196	20 571	19 814
Employees	35 050	35 750	35 427	35 289

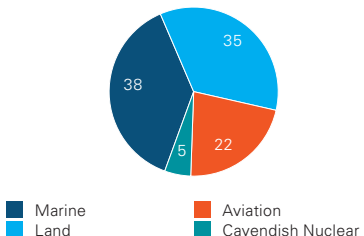
*Excluding JVs and associates.

**Variation based on revenue in local currency.

See €/£ exchange rates p.7.

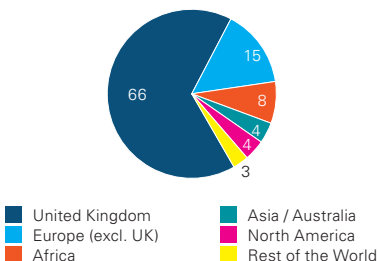
***Net income attributable to shareholders.

REVENUE BY BUSINESS LINE (%)*



*Excluding changes in scope (Marine and Cavendish Nuclear).

REVENUE BY REGION (%)



MAIN PROGRAMMES, COOPERATIONS AND EXPORT PARTNERSHIPS

	BAE Systems	Rolls-Royce	Thales	Camel Laird	DSME	Lockheed Martin	Dassault Aviation	ASC Pty Ltd	UGL	BMT
Engineering and systems										
Royal Navy's Queen Elizabeth-class aircraft carrier (HMWHS)*	●	●	●							
Royal Navy's Type 26 frigate (weapon systems)	●	●	●							
Royal Navy's Type 31 future frigate (General Purpose Frigate programme)			●							●
Royal Navy's Fleet Solid Support Ship programme	●	●		●						
Republic of Korea Navy's KSS-III Dosan Ahn Changho-class submarine (WHLS)**					●					
MRO and support services										
Royal Navy's Type 23 frigates life extension programme (LIFEX)	●									
Royal Navy's Vanguard-class submarines life extension programme										
Royal Australian Navy's ANZAC-class frigates and Canberra-class LHD MRO										●
Royal Australian Navy's Collins-class submarines MRO							●			
VISSC programme (Canadian Navy's Victoria-class submarines MRO)										
HADES programme (Royal Air Force support services ; 20 sites)										
Royal Air Force's Hawk trainer aircraft integrated operational support	●	●								
Naval base management										
Maritime support delivery framework (HM Naval Base Devonport and HM Naval Base Clyde)	●									
Outsourcing contracts										
Phoenix II Project (fleet management service)										
UK Military Flying Training System (MFTS) programme						●				
FOMEDEC programme (French Air Force training)							●			

*Highly Mechanised Weapons Handling System

**Weapon Handling and Launch System

STRATEGIC HIGHLIGHTS

Business trends

- ▶ Babcock International is a British systems integrator and defence service provider (MRO, management of complex sites, logistical support). The group is among BAE Systems' main defence partners.
- ▶ Excluding joint ventures and equity interests, Babcock's net sales fell 4% to £4.47bn (€5.07bn) in 2018-2019. More specifically, the group's two main divisions, Marine and Land (38% and 35% of group net sales, respectively), reported declines in activity of 4.5% and 11.4% over the year. While Babcock's order book has been slightly and continuously declining, business prospects remain overall positive thanks to the group's various multi-year contracts for maintenance and training services.
- ▶ Babcock generates 46% of its turnover in defence, but the share varies significantly by division. Defence activities for instance accounted for 85% of revenues in Babcock's Marine division, compared to 38% for Land and 35% for Aviation.

Home market

- ▶ The group generated a little less than two-thirds of its revenues in the United Kingdom, about 10 percentage points less than in 2014, in line with the group's desire to strengthen its international positions.
- ▶ The group is a key partner of the United Kingdom Ministry of Defence (MoD). As part of the Maritime Support Delivery Framework contract, signed in October 2014 and covering a period of five and a half years, Babcock is involved in 23 service and support projects at the Clyde and Devonport naval bases. The group is currently in talks with the MoD for a five-year extension of the contract until 2025.
- ▶ The LIFEX (Life Extension) programme for the modernisation of 13 Type 23 frigates of the Royal Navy, overseen by the Surface Ship Support Alliance (MoD, Babcock and BAE Systems), continued with the renovation of 5 vessels (Richmond, Lancaster, Portland, Somerset and Iron Duke). The end of the programme is set for 2024.
- ▶ In September 2019, the United Kingdom's MoD selected a Babcock-led consortium including Thales UK (supplier of the combat management system) and BMT (involved in ship development and maintenance) to provide the future Type 31 frigates of the Royal Navy. The consortium was in competition with BAE Systems (in partnership with Cammel Laird) and Atlas Elektronik UK (in partnership with its parent company TKMS).

Export markets

- ▶ The share of Babcock's international sales remained above 30%, in line with the target set by the group in recent years.
- ▶ In December 2018, Naval Ship Management, a joint venture between Babcock and Australia's UGL, won a five-year AUD 1.5bn (€951m) contract with the Royal Australian Navy for the maintenance of two Canberra-class Amphibious Assault Ships and 12 associated landing crafts. The contract may be renewed for two five-year periods.
- ▶ In the spring of 2019, Babcock delivered the last batch of Pilatus PC-21 turboprop-powered advanced trainer aircraft as part of the French Air Force's FOMEDEC programme. The 11-year contract, signed in 2017 with Babcock as lead contractor and Dassault Aviation as a partner, includes the delivery and maintenance of 17 Pilatus PC-21 training aircraft, related simulators and modernised training facilities.
- ▶ In April 2019, the Irish Naval Service formally commissioned LÉ George Bernard Shaw, the fourth and last Samuel Beckett-class offshore patrol vessel that was designed by Vard Marine (Financier) as prime contractor and built by Babcock Marine at its Appledore shipyard as part of a €280m contract.
- ▶ In June 2019, Duqm Naval Dockyard (DND), a joint venture between Babcock and Oman Drydock Company set up in 2017, finalised the repair and modernisation of the U.S. Navy's Choctaw County, a Spearhead-class expeditionary fast transport vessel. DND, which specialises in the repair and maintenance of military ships in Oman's Duqm port complex, is of strategic importance for Babcock's objective to win market share in the Middle East.



BUSINESS AREAS

Platform manufacturer and systems integrator

- ▶ Military aircraft (manned and unmanned aircraft)
- ▶ Naval platform and systems (surface ships and submarines)
- ▶ Land platform and systems (armoured vehicles and artillery systems)
- ▶ Defence electronics
- ▶ Cybersecurity

GOVERNANCE

Chairman	Sir Roger Carr
Chief Executive Officer	C. Woodburn
Managing Director, Air	C. Boardman

OWNERSHIP STRUCTURE (as of 20.11.2019)

Symbol	BA
Listed on	LSE
Market Cap (£m)	18 531

Major shareholders (as of 20.11.2019)

Invesco Asset Management Ltd.	4,46%
Barclays Bank Plc (Private Banking)	3,97%
Silchester International Investors LLP	3,00%
Newton Investment Management Ltd.	2,81%
The Vanguard Group Inc.	2,80%

MAIN JOINT VENTURES AND ASSOCIATES

Name	%	Country
Eurofighter Jagdflugzeug GmbH	33%	Germany
Panavia Aircraft GmbH	42,5%	Germany
MBDA	37,5%	France
CTA International SAS	50%	France
Advanced Electronics Company Ltd	44%	Saudi Arabia
FADEC International LLC	50%	United States

KEY FIGURES (Fiscal year ended: December 31st)

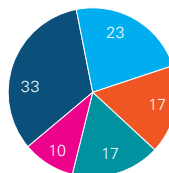
€ millions	2015	2016	2017**	2018
Revenue	23 123	21 722	19 640	19 007
Δ (%) [E]*	8,79%	5,97%	-3,18%	-2,34%
Defence (%)	92%	91%	92%	91%
Export (%)	77%	78%	80%	78%
Operating profit/loss	1 917	2 017	1 496	1 655
Operating margin	8,29%	9,29%	7,62%	8,71%
Net income***	1 264	1 115	943	1 130
Order book	50 136	49 065	43 630	54 078
Employees	82 500	83 100	83 200	85 800

*Variation based on revenue in local currency. See €/£ exchange rates p. 7.

**2017 figures restated.

***Net income attributable to shareholders.

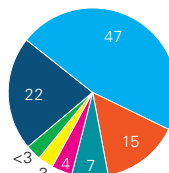
REVENUE BY BUSINESS LINE (%)*



Legend for Revenue by Business Line (%):
 Air (Dark Blue), Electronic Systems (Light Blue), Maritime (Orange), Platforms & Services (US) (Teal), Cyber & Intelligence (Pink).

*Excluding Headquarter division.

REVENUE BY REGION (%)



Legend for Revenue by Region (%):
 United Kingdom (Dark Blue), United States and Canada (Light Blue), Saudi Arabia (Orange), Europe (excl. UK) (Teal), Middle East (excl. Saudi Arabia) (Pink), Australia (Yellow), Rest of the World (Green).

MAIN PROGRAMMES, COOPERATIONS AND EXPORT PARTNERSHIPS

	Airbus	Leonardo	Thales	Lockheed Martin	Northrop Grumman	General Dynamics	Babcock International	Raytheon	Rolls-Royce	QinetiQ	ASC Pty Ltd	Nexter*	Saab AB
Military aircraft													
Tempest fighter aircraft programme		●						●					
Eurofighter Typhoon fighter aircraft	●	●											●
F-35 Lightning II fighter aircraft (Lockheed Martin's level 1 partner)				●	●								
Hawk AJT trainer aircraft				●				●					
Naval platform and systems													
Hunter-class frigate (SEA 5000 programme)			●	●						●			●
Type 26 frigate (Global Combat Ship programme)		●						●	●				
Future CSC frigate (Canadian Surface Combatant)**			●										
River-class Offshore Patrol Vessel													
Queen Elizabeth-class aircraft carrier		●				●		●	●				
Dreadnought-class ballistic missile submarine			●			●		●					
Astute-class nuclear-powered attack submarine		●		●		●		●					
Land platform and systems													
Armoured Multi-Purpose Vehicle (AMPV)													
CV90 infantry fighting vehicle		●											●
M109A7 self-propelled howitzer													
40mm Cased Telescoped Armament System (40CTAS)***												●	
Excalibur advanced precision guided 155mm and 127mm artillery shells								●					
Cyber & Intelligence													
GEOINT-ISR solutions	●												

*KNDIS group **Based on Type 26 frigates ***CTA International, joint venture between BAE Systems and Nexter

STRATEGIC HIGHLIGHTS

Business trends

- ▶ BAE Systems is a British platform manufacturer and systems integrator and the world's fourth-largest defence contractor by revenue. The group is the leading arms supplier to the United Kingdom, Saudi Arabia and Australia, and among the top 10 defence contractors to the U.S. Department of Defense. Its turnover reached £16.8bn (€19.0bn) in 2018, down 2.3% in 2018 in local currency, mainly due to a decline in production of Typhoon fighter aircraft and Hawk trainer aircraft.
- ▶ BAE Systems aims to become the world leader in defence, aerospace and security within 5 to 10 years by focusing on three areas: increasing its export revenues, strengthening its defence services offering, and restructuring certain activities (particularly in the field of land-based platforms).

Home market

- ▶ BAE Systems generated 21.5% of its revenue in the United Kingdom in 2018, a share that has been decreasing over the past years (-1.2 percentage points compared to 2015).
- ▶ The group secured a £2.4bn (€2.7bn) contract to deliver the 7th Astute-class nuclear-powered attack submarine (SSN), named Agincourt, and to accelerate work on the first of four Dreadnought-class ballistic missile submarines (SSBN).
- ▶ In January 2019, BAE Systems sold a 55% majority stake in its Land UK tank and combat vehicle division to Germany's Rheinmetall for £29m (€33m) to create a joint venture called Rheinmetall BAE Systems Land (RBSL). The deal, limited to the British market, does not concern BAE Systems' ammunition activities, nor its joint venture with Nexter (KNDS), CTA International, which produces the CTAS40 automatic cannon.

Export markets

- ▶ The group generated 78% of its revenue from exports, mainly to the United States and Saudi Arabia. BAE Systems is increasingly dependent on the American market (47% of total revenue), a trend that is set to strengthen in the coming years due to the growing share of the F-35 programme in its activity.
- ▶ In June 2018, BAE Systems was selected by the Royal Australian Navy for the SEA 5000 programme to build 9 Hunter-class anti-submarine warfare frigates (based on BAE System's Type 26 frigate) that will replace the Anzac-class frigates. In December 2018, BAE Systems signed a first contract for AUD\$ 1.9bn (€1.2bn) for studies relating to the design of future vessels, which will meet the specific needs of the Australian Navy. The total cost of the programme is estimated at AUD\$ 35bn (€22bn).
- ▶ In September 2018, BAE Systems finalised a £5.1bn (€5.8bn) contract to supply Qatar with 24 Typhoon fighter aircraft and 9 Hawk trainer aircraft. The first fighter aircraft are scheduled for delivery in 2022.
- ▶ In February 2019, BAE Systems signed 2 contracts for a total of \$575m (€506m) with the U.S. Army to start production of the Armoured Multi-Purpose Vehicle (AMPV) in the United States. Options are provided for the production of 460 vehicles, for a total cost of \$1.2bn (€1.1bn).
- ▶ In February 2019, Canada selected Lockheed Martin, BAE Systems and four other partners for its Canadian Surface Combatant (CSC) frigate programme, whose design will be based on that of the British Type 26 frigate. The programme covers 15 frigates, for a total value of AUD\$ 69.8bn (€46.4bn).

Technology and Innovation

- ▶ Self-financed R&D expenditure decreased 6.7% to £222m (€251m) in 2018.
- ▶ BAE Systems is part of the Team Tempest consortium, which is responsible for the future Tempest fighter aircraft. The group is the prime contractor, with partners including the British Ministry of Defence, Rolls-Royce, Leonardo UK and MBDA UK. The consortium has since been joined by the Swedish Ministry of Defence (in view of a possible participation of Saab AB) and several Italian players (Elettronica, Leonardo Italy, Avio Aero and MBDA Italy), as part of a cooperation between the United Kingdom and Italy in the military aviation sector.



BUSINESS AREAS

Platform manufacturer and systems integrator

- ▶ Commercial aircraft
- ▶ Military aircraft (combat, transport, surveillance, unmanned aircraft systems)
- ▶ Defence electronics, cyber and C4ISR
- ▶ Missile defence and weapon systems
- ▶ Space

GOVERNANCE

Chief Executive Officer **D. A. Muilenburg**

CEO Boeing Defense, Space & Security **L. Caret**

President of Embraer Partnership and Group Operations **B.-M. Allen**

OWNERSHIP STRUCTURE (as of 20.11.2019)

Symbol	BA
Listed on	NYSE
Market Cap (\$m)	208 739

Major shareholders (as of 20.11.2019)

The Vanguard Group, Inc.	7,08%
T. Rowe Price Associates, Inc. (Investment Management)	7,04%
Capital Research & Management Co.	6,98%

MAIN JOINT VENTURES AND ASSOCIATES

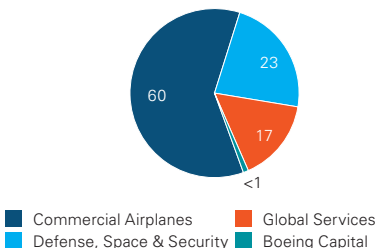
Name	%	Country
Hellfire Systems LLC	50%	United States
United Space Alliance	50%	United States
United Launch Alliance	50%	United States
Boeing Brasil-Commercial	80%	Brazil
Initium Aerospace	50%	United States
Ural Boeing Manufacturing	50%	Russia
Tata Boeing Aerospace Limited	50%	India
Boeing Embraer-Defense	49%	N/A

KEY FIGURES (Fiscal year ended: December 31st)

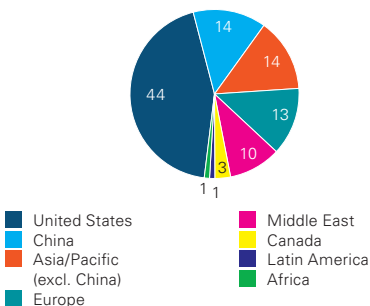
€ millions	2015	2016***	2017***	2018
Revenue	86 589	84 459	83 190	85 628
Δ (%)/[\$]*	5,90%	-2,72%	0,54%	7,58%
Defence (%)**	25%	22%	22%	23%
Export (%)	59%	57%	54%	56%
Operating profit/loss	6 705	5 896	9 154	10 150
Operating margin (%)	7,74%	6,98%	11,00%	11,85%
Net income	4 663	4 547	7 485	8 857
Order book	449 310	449 233	395 863	428 368
Employees	161 400	150 500	140 800	153 000

*Variation based on revenue in local currency. See €/€ exchange rates p.7
 **Defense, Space & Security division only.
 ***2016 and 2017 figures restated.

REVENUE BY BUSINESS LINE (%)



REVENUE BY REGION (%)



MAIN PROGRAMMES, COOPERATIONS AND EXPORT PARTNERSHIPS

	KHI*	Raytheon	Northrop	Grumman	Bell Helicopter**	Saab AB	Lockheed Martin	Leonardo	Aeroleit Rocketbyrne	Bombardier	Mahindra Defence Systems	Rohde & Schwarz	Embraer	HAL
Military aircraft														
F/A-18E/F Super Hornet fighter aircraft		●								●				●
KC-46A Pegasus tanker aircraft														
KC-390 transport aircraft														●
Maritime Surveillance Aircraft (MSA)									●					
T-7A Red Hawk trainer aircraft***					●									
Military helicopters														
SB>1 DEFIANT twin-engine multi-role helicopter							●							
MH-139 twin-engine multi-role helicopter								●						
CH-47 Chinook twin-engine multi-role helicopter	●							●			●			
V-22 Osprey multi-role tiltrotor helicopter					●									
AH-64 Apache Advanced Attack Helicopter (AAH)	●	●					●	●						
Unmanned systems														
MQ-25 Stingray refueling UAS														
Wave Glider USV														
Echo Voyager UUV														
Weapon systems and guided missiles														
Ground-Launched Small Diameter Bomb (GLSDB)						●								
Joint Direct Attack Munition (JDAM)														
Space														
CST-100 Starliner spacecraft														
Space Launch System (SLS)		●				●		●						

*Kawasaki Heavy Industries group **Textron group ***TX programme

STRATEGIC HIGHLIGHTS

Business trends

- ▶ Boeing is the world's second-largest defence company, behind Lockheed Martin, and the world's largest commercial aircraft manufacturer by volume. In defence, the group is present in several segments: military helicopters, military aircraft, UAS and USV/UUVs, missiles and guided munitions, space launchers, etc. Boeing's revenue for the first time exceeded the \$100bn threshold (\$101.1bn, or €85.6bn) in 2018, a 7.6% year-on-year increase in local currency. The Defense, Space & Security division, which accounted for 22.9% of the group's total revenue, posted strong growth (+12.8% year-on-year), mainly driven by export sales.
- ▶ Despite an improving financial performance in recent years, the group has been facing several difficulties, including delivery delays and quality issues on the KC-46 Pegasus tanker aircraft programme in the military sector, as well as various accidents involving 737 MAX aircraft, one of Boeing's bestselling aircraft in the civil sector, which led to the grounding of the planes by airlines and a 20% drop in the group's production of these aircraft. In July 2019, Boeing consequently announced an exceptional provision of \$5.6bn (€5bn) for the compensation of 737 MAX customers.
- ▶ A few months after the acquisition of U.S. aircraft equipment manufacturer KLX for \$4.3bn (€3.6bn), Boeing acquired 80% of the commercial aviation division of Brazilian aircraft manufacturer Embraer and founded Boeing Brasil Commercial, a joint venture that merges Embraer's commercial aviation division with Boeing's Brazilian operations. The \$4.2bn (€3.7bn) transaction has been approved by U.S. antitrust authorities but remains subject to approval from the European Commission. Embraer and Boeing are also planning to set up a second joint venture called Boeing Embraer-Defense (in which Embraer will hold a 51% capital stake and Boeing 49%) aimed at promoting the KC-390 military cargo jet.

Home market

- ▶ Boeing generated 44% of its revenue in the United States in 2018. The weight of the U.S. market in the group's total revenue has been declining over the past decade (-17 percentage points), while the contribution of China, the group's second-largest market (mainly commercial activities) has been rising. In defence, however, the U.S. market remains dominant.
- ▶ In late 2018, the group won two major U.S. Air Force tenders in a row. The first, worth \$2.4bn (€2.1bn), with Italy's Leonardo as a partner, provides for the supply of 84 MH-139 helicopters. The second, a \$9.2bn (€7.9bn) contract won in partnership with Saab AB, provides for the delivery of 351 T-7A Red Hawk (T-X programme) trainer aircraft and 46 simulators.
- ▶ In March 2019, Boeing was awarded a contract valued at \$4bn (€3.5bn) to upgrade 78 F/A-18 Super Hornet Block II fighter aircraft to the Block III standard.
- ▶ After the delivery of the first KC-46 Pegasus tanker aircraft, the U.S. Air Force awarded Boeing a \$2.6bn (€2.4bn) contract for a 5th production batch (15 additional aircraft). With this batch, the number of such aircraft ordered by the United States since August 2016 increases to 67.

Export markets

- ▶ 56% of Boeing's revenue was generated abroad, but a large part of it by the Commercial Airplanes division.
- ▶ Japan ordered a second KC-46A Pegasus tanker aircraft. Produced in Seattle, the aircraft is scheduled for delivery in June 2021 and will be used to refuel the entire Japanese Air Self-Defense Force.
- ▶ Boeing and Israel Aerospace Industries (IAI) entered into a strategic partnership for future cooperation in the field of civil and military aviation, in Israel and internationally. The agreement comes as Israel is expected to announce a \$11bn (€9.3bn) purchase programme for U.S. military equipment.

Technology and Innovation

- ▶ The group's R&D expenditure amounted to \$3.3bn (€2.8bn) in 2018, up to 2.8% over the year.



BUSINESS AREAS

Platform manufacturer

- ▶ Commercial shipbuilding (cargo vessels, oil tankers, container carriers)
- ▶ Military shipbuilding (surface ships, submarines (SSN, SSBN, SSK), naval drones)
- ▶ Naval ammunition
- ▶ Energy and electromechanical equipment

GOVERNANCE

Chief Executive Officer
Executive Director

Wu Yongjie
Feng Yongqiang

KEY FIGURES (Fiscal year ended: December 31st)

€ millions	2015	2016	2017	2018
Revenue	32 457	38 085	39 362	39 067
Δ (%) /CNY)*	12,22%	23,72%	7,25%	1,58%
Defence (%)	N/A	N/A	N/A	~20%
Export (%)	N/A	N/A	N/A	N/A
Operating profit/loss	N/A	N/A	N/A	N/A
Operating margin (%)	N/A	N/A	N/A	N/A
Net income	1 513	751	870	1 134
Order book	N/A	N/A	N/A	N/A
Employees	N/A	N/A	N/A	>150 000

*Variation based on revenue in local currency.
See € /CNY exchange rates p.7.

OWNERSHIP STRUCTURE

Symbol	
Listed on	Unlisted group
Market Cap	

Major shareholders (as of 20.11.2019)

Chinese State | 100%

REVENUE BY BUSINESS LINE (%)



MAIN JOINT VENTURES AND ASSOCIATES*

Name	%	Country

*No information available.

REVENUE BY REGION (%)



CHINA SHIPBUILDING INDUSTRY CORPORATION (CSIC)

MAIN PROGRAMMES, COOPERATIONS AND EXPORT PARTNERSHIPS

	CSIC*	Bousteed Naval Shipyard	Kuina Shipyard Ltd	Naval Shipyard Ltd	KS & EW**
Surface ships					
Type 001A aircraft carrier					
Type 002 aircraft carrier	●				
Type 003 future nuclear powered aircraft carrier	●				
Type 051 and 055 destroyers	●				
Type 056 corvette	●	●	●		
Durjoy-class Large Patrol Craft (LPC)		●			
Padura-class OPV		●			
Royal Malaysian Navy's Littoral Mission Ship (LMS)		●			
Type 905 replenishment tanker					
072II/A amphibious landing ship					
Submarines					
Type 092 and 94 ballistic missile submarines (SSBN) and Type 096 future ballistic missile submarine					
Type 091, 093 and 095 nuclear-powered attack submarines (SSN)					
Type 035/035G conventionally-powered submarine (SSK)	●	●			
Type 039 and 041 conventionally-powered submarines (SSK)	●				
Type S20 conventionally-powered submarine (SSK)***					●
Type S26T conventionally-powered submarine (SSK)****					
Unmanned surface vessels					
JARI multi-purpose unmanned combat vessel					
Marine Lizard autonomous amphibious vehicle					
Naval weapons					
Torpedoes					

*China State Shipbuilding Corporation **Karachi Shipyard & Engineering Works Ltd ***Based on Type 039A ****Based on Type 041

STRATEGIC HIGHLIGHTS

Business trends

- ▶ China Shipbuilding Industry Corporation (CSIC) is China's largest shipbuilding company, the leading supplier to the Chinese Navy, the prime contractor for Chinese SSBNs and the first Chinese-made aircraft carrier. The group generated sales of CNY 305bn (€39bn) in 2018, of which about 20% in the defence sector.
- ▶ CSIC comprises around 100 industrial entities and research centres and has more than 150,000 employees. Its subsidiaries Dalian Shipbuilding Industry Company and Wuchang Shipbuilding Industry Group build and upgrade the group's main surface vessels.
- ▶ In a context of strong consolidation in the shipbuilding industry (a strategic sector of the Made in China 2025 industrial plan), for instance with the merger of South Korean shipbuilding companies Hyundai Heavy Industries (HHI) and Daewoo Shipbuilding & Marine Engineering (DSME), a merger project was announced in July 2019 between the two leading Chinese shipbuilding companies CSIC and CSSC (China State Shipbuilding Corporation, the world's second-largest civil shipbuilding company after HHI). The two Chinese groups will have a combined turnover of €66bn and concentrate 13% of the global shipbuilding market (including civil).

Home market

- ▶ The first fully Chinese-made aircraft carrier (type 001A) was launched in 2017 in CSIC's shipyards and is expected to be fully operational in 2020. The commissioning of the second-generation aircraft carrier (type 002) is planned for 2023. In 2018, CSIC also announced the beginning of the construction of China's first nuclear-powered aircraft carrier. This aircraft carrier (type 003) should not be put into service before 2025.
- ▶ The group completed the commissioning of two type 094 ballistic missile submarines (or SSBN), of which four units have already been produced. It plans to launch production of a new type of SSBN (096) in the early 2020s. This new type could be armed with Chinese JL-3 ballistic missiles.
- ▶ In alternation with CSSC, CSIC is responsible for the construction of the new 055 destroyers designed to escort Chinese aircraft carriers (the first unit was commissioned in 2019).

Export markets

- ▶ In the military sector, CSIC exports to some 15 countries (mainly in Asia, Africa and Latin America) through its subsidiary China Shipbuilding and Offshore International Company (CSOC).
- ▶ In 2016, Pakistan became the first importing country of a Chinese-made submarine after ordering eight Type S20 conventionally-powered submarines (SSK) (a variant of Type 039A), of which the first four will be built by CSIC and delivered by 2022. The remaining four units will be produced locally by Pakistan's Karachi Shipbuilding and Engineering Works (KSEW). CSIC will also supply a Type S26T conventionally-powered submarine (SSK) (a variant of Type 041) to the Royal Thai Navy as part of a \$390m (€345m) order placed in 2017. Two additional units may be ordered at a later date.
- ▶ In January 2018, the group delivered two Durjoy-class LPC (Large Patrol Aircraft) to strengthen Bangladesh's anti-submarine warfare capabilities. The two ships were produced in partnership with CSSC and Bangladeshi shipyard Khulna Shipyard Ltd. In April 2019, the Bangladeshi Navy also received the last two Type 056 corvettes out of four units ordered in total.
- ▶ In 2019, CSIC launched the two Keris-type LMS (Littoral Mission Ship) frigates ordered by Malaysia in 2017 for MYR 1.05bn (€216m). The Malaysian shipyard Boustead Naval Shipyard, a partner in the programme, was initially set to produce two additional frigates, but the contract was revised downwards.

Technology and Innovation

- ▶ The group's R&D expenditure amounted to CNY 23.6bn (€3bn) in 2018, representing 7.7% of revenue.
- ▶ In late 2018, CSIC presented the JARI unmanned combat vessel capable of firing four missiles at a maximum range of 5 km.



BUSINESS AREAS

Systems integrator/equipment supplier

- ▶ Aeronautics (refuelling systems, communication systems, services)
- ▶ Defence electronics and sensors
- ▶ Solutions for communication
- ▶ Robotics

GOVERNANCE

Chairman	Jamie Pike
Chief Executive Officer	David Lockwood
VP Programmes and Engineering	Tim Harrington

OWNERSHIP STRUCTURE (as of 20.11.2019)

Symbol	COB
Listed on	LSE
Market Cap (€m)	3 828

Major shareholders (as of 20.11.2019)

Silchester International Investors	10,60%
Threadneedle Asset Management Ltd.	9,88%
1832 Asset Management LP	3,11%
M&G Investment Management Ltd.	2,82%
Invesco Asset Management Ltd.	2,80%

MAIN JOINT VENTURES AND ASSOCIATES

Name	%	Country
Aviation Défense Service S.A.	45%	France
Northrop Grumman Cobham Intercoms LLC	50%	United States
Philtec Co. Ltd	30%	South Korea
AirTanker Services Ltd	5%	United Kingdom
AirTanker Holding Ltd	13%	United Kingdom

KEY FIGURES (Fiscal year ended: December 31st)

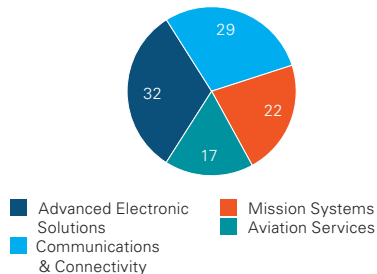
€ millions	2015	2016	2017**	2018
Revenue	2 854	2 374	2 385	2 105
Δ (%) [E]*	11,90%	-6,18%	760%	-10,92%
Defence (%)	62%	59%	60%	64%
Export (%)	89%	90%	91%	92%
Operating profit/loss	17	-951	122	126
Operating margin (%)	0,58%	-40,08%	5,11%	6,01%
Net income***	-52	-971	96	83
Order book	3 374	3 442	2 928	2 984
Employees	11 505	10 692	10 813	10 069

*Variation based on revenue in local currency. See €/£ exchange rates p.7.

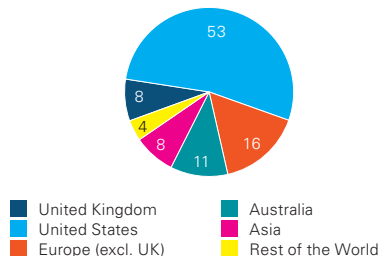
**2017 figures restated.

***Net income attributable to shareholders.

REVENUE BY BUSINESS LINE (%)



REVENUE BY REGION (%)



MAIN PROGRAMMES, COOPERATIONS AND EXPORT PARTNERSHIPS

	Embraer	Boeing	Lockheed Martin	Northrop Grumman	Airbus	Thales	Elbit Systems	Collins Aerospace*	BAE Systems	Leonardo	Rafael	Textron
Avionics equipment												
Electronic warfare suites		●	●						●			
Navigation systems												
Tactical communication and surveillance systems				●		●	●					
Aircraft audio and radio management systems					●				●			●
JetLAN advanced airborne computers	●	●		●								
ELT VHF/UHF antennas, navigation	●	●		●								
SATCOM terminals		●	●									
Oxygen systems	●											
Defence systems												
Countermeasures systems		●			●			●	●			
RF and microwave modules	●	●	●	●				●	●			
Sensor solutions: RWR , antennas, radar, missile, navigation												
SPS Series Precision Positioners	●	●	●					●	●			
Transmitters and receivers for electronic warfare												
AESA antennas and radar subsystems	●		●									
Mission systems												
Weapons carriage and release equipment, pylons	●	●	●		●	●		●	●	●		
Refuelling systems (pods, aircrafts fuel tanks, hose and drogue systems)	●	●	●	●	●							
Aviation services (MRO, modification, flight inspection services, training)		●	●									
Robotics (Telemax, tEODor, OSCAR, NBCmax)												

* Formerly Rockwell Collins, UTC group

STRATEGIC HIGHLIGHTS

Business trends

- ▶ Cobham is a British systems and equipment manufacturer operating in the civil and military fields. In defence, the group operates in the land, naval and air segments and mainly provides defence electronics systems (countermeasures, electronic surveillance), security systems (oxygen systems), mission systems (refuelling, missile eject launchers), avionics systems and communications systems. The group is also a major player in pilot training and also operates in the space sector.
- ▶ During 2018, Cobham recorded a decline in revenue of nearly 11% to £1,863m (€2,105m), mainly due to declining activity in the Communications & Connectivity (-21.2%) and Aviation Services (-14.0%) divisions. At constant scope and exchange rates, revenue declined slightly less sharply (-2.0%).
- ▶ The group's operating performance nevertheless improved in 2018. Operating margin reached 6% for the year, compared to 5.1% in 2017. However, it could decline again in 2019 due to the compensation that the group must pay to Boeing for delays in the delivery of in-flight refuelling systems for KC-46A Pegasus aircraft (up to £160m, or €183m).
- ▶ In September 2019, Cobham's shareholders, mainly investment funds, approved the acquisition of the entire group by U.S. private equity fund Advent International. Advent's offer values the British group at £4bn (€4.5bn).

Home market

- ▶ The United Kingdom is the group's third-largest market after the U.S. and Australia. Cobham generated 7.7% of its revenue in the UK in 2018, compared with 12.3% four years earlier, a decline that was mainly due to the completion of the training contract with the UK Defence Helicopter Flying School (DHFS) in March 2018.
- ▶ Cobham signed a contract worth more than £50m (€57m) in February 2019 for the supply of electronic warfare training modules (radar jamming, communications jamming, threat simulation, etc.) as part of the NATO JEWCS (Joint Electronic Warfare Core Staff) programme. The programme is under the responsibility of the British Ministry of Defence (MoD).
- ▶ The MoD's future ASDOT (Air Support to Defence Operational Training) project, for which Cobham Aviation Services was competing (in partnership with Draken International, QinetiQ and 3SDL), was postponed due to the excessive costs of the bids submitted by the four competing groups respectively led by Cobham Aviation Services, Babcock Aerospace, Thales UK and Leonardo. The budget provided by the British Ministry of Defence was £1.25bn (€1.4bn). The programme, the first phase of which was to start in 2020, had an initial duration of 10 years, with an option for a five-year extension.

Export markets

- ▶ Cobham is highly dependent on the U.S. market, which accounts for more than 50% of its turnover. The group supplies many systems and components for Lockheed Martin's F-35 Lightning II fighter aircraft as well as Boeing's KC-46A Pegasus tanker aircraft.
- ▶ In May 2019, Boeing selected Cobham to supply the oxygen system for the future U.S. Air Force T-7A Red Hawk (T-X programme) trainer aircraft, developed by the American company in partnership with Saab AB.
- ▶ In June 2019, Israel's Rafael Advanced Defence Systems and Cobham teamed up to offer Rafael's I-Deby missiles with the British company's Fox-10 launchers.

Technology and Innovation

- ▶ Cobham's R&D expenditure fell by 15.3% to £103m (€117m) in 2018, representing 5.5% of the group's revenue.

BUSINESS AREAS

Platform manufacturer and systems integrator

- ▶ Executive jets
- ▶ Fighter aircraft
- ▶ Unmanned aircraft systems
- ▶ Maritime patrol aircraft
- ▶ Pyrotechnics and space activities
- ▶ Artificial intelligence (AI)

GOVERNANCE

Chairman and CEO	Éric Trappier
Chief Financial Officer	Denis Dassé
Executive Vice President, Military and Space Programmes	J-M. Gasparini

OWNERSHIP STRUCTURE (as of 20.11.2019)

Symbol	AM
Listed on	NYSE Euronext
Market Cap (€m)	10 402

Major shareholders (as of 20.11.2019)

GIMD (Dassault Family)	62,20%
Airbus	9,89%
T. Rowe Price International Ltd.	2,10%
DNCA Finance SA	1,84%

MAIN JOINT VENTURES AND ASSOCIATES

Name	%	Country
Thales	25%	France
SECBAT	54%	France
GIE Rafale International	60%	France
Dassault Reliance Aerospace Ltd	49%	India

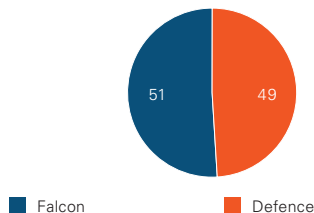
KEY FIGURES (Fiscal year ended: December 31st)

€ millions	2015	2016	2017*	2018
Revenue	4 176	3 586	4 876	5 084
Δ (%)	13,48%	-14,13%	35,97%	4,27%
Defence (%)	40%	35%	39%	49%
Export (%)	83%	83%	89%	78%
Operating profit/loss	361	218	357	669
Operating margin (%)	8,64%	6,08%	7,32%	13,16%
Net income**	482	384	410	681
Order book	14 175	20 323	19 460	19 376
Employees	12 177	11 942	11 398	11 494

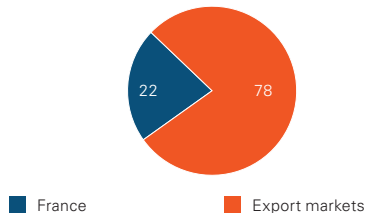
*2017 figures restated.

**Net income attributable to shareholders.

REVENUE BY BUSINESS LINE (%)



REVENUE BY REGION (%)



MAIN PROGRAMMES, COOPERATIONS AND EXPORT PARTNERSHIPS

	Thales	Safran	HAL	Naval Group	L3Harris Technologies**	HAL	Leonardo	RUAG	Airbus	Honeywell	Saab AB
Fighter aircraft											
Rafale (F4 standard)	●	●									
Mirage 2000	●	●	●								
NGWS	●	●							●		
Maritime patrol and reconnaissance aircraft											
Future maritime and patrol reconnaissance aircraft (ALBATROS programme, formerly AVSIMAR)*	●										
Falcon 2000 MRA/MSA	●			●							
ATL2 modernisation	●		●								
Falcon 900 MPA										●	
Falcon 8X military aircraft (ARCHANGE programme)	●										
Unmanned aircraft systems											
nEUROn UCAV demonstrator					●	●	●	●			●
European MALE RPAS						●		●			
Artificial Intelligence											
Man Machine Teaming advanced study programme	●										

*Based on Falcon 2000 LXS.

**Merger of L3 Technologies and Harris Corporation.

STRATEGIC HIGHLIGHTS

Business trends

- ▶ Dassault Aviation is a French aerospace and defence company and one of the world's leading manufacturers of civil (Falcon business jets) and military (Rafale fighter jets, patrol and surveillance) aircraft. The group's turnover reached a record €5.08bn in 2018 (+4.3% year-on-year). The Defence division was the group's main growth driver (+32.5%), thanks in particular to the delivery of nine Rafale fighter jets to Egypt and three to France during the year. The group plans to deliver 26 Rafale in 2019.
- ▶ The group's order book slightly decreased in 2018 (€19.4bn compared with €19.5bn the year before). The decrease, attributable to the Falcon branch, was mainly caused by the discontinuation of the Falcon 5X programme, which was terminated following development delays on Safran's Silvercrest engine, and more generally to a slowing business jet market.
- ▶ In early 2019, Dassault Aviation consecutively acquired the worldwide maintenance operations of ExecuJet, a subsidiary of Luxembourg-based Luxaviation (Europe's leading business aviation operator), and TAG Maintenance Services, a subsidiary of TAG Aviation that specialises in business aircraft maintenance. At the same time, the group sold SABCA, a Belgian aerospace manufacturing company which operates in the civil aviation, space and defence sectors.

Home market

- ▶ In January 2019, Dassault Aviation signed a €2bn contract to develop the Rafale F4 standard, which includes improving aircraft capabilities and integrating new weapons. Validation of the F4 standard is planned for 2024, with some functions available from 2022. At the same time, 30 F4 standard Rafale aircraft were ordered by the Ministry of the Armed Forces, to be delivered between 2027 and 2030.
- ▶ The French defence procurement agency (DGA) has entrusted Dassault Aviation with the detailed definition study for the future maritime and patrol reconnaissance aircraft (AVISMAR programme) of the French Navy. The aircraft, whose design will be based on the Falcon 2000 LXS, will replace the Falcon 50 M and Falcon 200 Gardian currently in service. A total of 13 aircraft could be ordered and delivered by 2030, including three in 2025.
- ▶ In February 2019, the French and German Defence Ministers awarded Dassault Aviation and Airbus a €65m contract (equally financed by France and Germany) for a Joint Concept Study to identify the technical needs and assess the feasibility of the future European NGWS fighter aircraft, as part of Future Combat Air System (FCAS) programme.

Export markets

- ▶ Dassault Aviation generates a large part of its revenue from exports (78% in 2018, compared to 89% in 2017). In defence, the share of export sales reached 57% in 2018.
- ▶ The group delivered the first Rafale to the Qatari Air Force (QCAF) in February 2019. Following the option exercised for 12 additional Rafale aircraft (in addition to the 24 initially planned), 35 aircraft have yet to be delivered by Dassault Aviation in the coming years.
- ▶ In October 2019, India received the first of the 36 Rafale fighter jets ordered at the end of 2016. Dassault Aviation is also participating in tenders for the Indian Air Force (110 fighter aircraft) and the Indian Navy (57 naval fighter aircraft).
- ▶ Dassault Aviation aims to take advantage of the renewal of fighter aircraft fleets across Europe to increase Rafale exports in the European market. After failing to win Belgium's F-16 fleet replacement programme, awarded to Lockheed Martin's F-35, the French group offered the Rafale in Switzerland (in a contract for the supply of some 30 aircraft) and Finland (planned purchase of 64 aircraft).

Technology and Innovation

- ▶ The group's self-financed R&D expenditure amounted to €391m in 2018, representing 7.7% of its revenue.



BUSINESS AREAS

Systems integrator/equipment supplier
 Defence division of German conglomerate Diehl

- ▶ Missile systems and air defence systems
- ▶ Ammunition
- ▶ Surveillance and reconnaissance systems
- ▶ Transmission systems, support services and training

GOVERNANCE

President Corporate Division	Claus Günther
Executive Director	T. Bodenmüller
Chief Executive Officer	Helmut Rauch

KEY FIGURES (Fiscal year ended: December 31st)

€ millions	2015	2016	2017	2018
Revenue	405	435	456	464
Δ (%)	-17,01%	7,41%	4,83%	1,75%
Defence (%)	100%	100%	100%	100%
Export (%)	28%	31%	46%	42%
Operating profit/loss	N/A	N/A	N/A	N/A
Operating margin (%)	N/A	N/A	N/A	N/A
Net income	N/A	N/A	N/A	N/A
Order book	N/A	N/A	N/A	N/A
Employees	2 315	2 301	2 341	2 509

OWNERSHIP STRUCTURE

Symbol	
Listed on	Unlisted division
Market Cap	
Major shareholders (as of 20.11.2019)	
Diehl group	100%

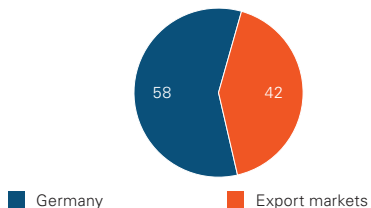
REVENUE BY BUSINESS LINE (%)



MAIN JOINT VENTURES AND ASSOCIATES*

Name	%	Country
Eurospike GmbH	40%	Germany
Junghans Microtec GmbH	55%	Germany
GIWS	50%	Germany
Parsys GmbH	50%	Germany
RAM-SYSTEM GmbH	50%	Germany

REVENUE BY REGION (%)



*JVs and associates of Diehl group.

MAIN PROGRAMMES, COOPERATIONS AND EXPORT PARTNERSHIPS

	Raytheon	MBDA	Rafael	Hensoldt	TKMS*	Leonardo	Saab AB	Rohde & Schwarz	Rheinmetall Defence	Elbit Systems	Kongsberg	Lockheed Martin	Safran	Boeing	ESG
Missile systems and air defence systems															
Sidewinder air-to-air missile	●														
IRIS-T and IRIS-T SL/SLM missiles		●							●						
IDAS missile				●											
RBS15 Mk3 anti-ship missile						●									
RAM Block 2 and RAM Mk49 guided missiles	●	●													
PARS 3 LR anti-tank missile		●													
Spike LR anti-tank missile			●					●							
HUSSAR air-to-ground missile												●			
NGWS weapon systems (FCAS programme)		●	●				●								●
Falcon air defence system							●				●				
Ammunition															
40mm infantry ammunition															
76mm and 127mm naval ammunition															
VULCANO guided ammunition family					●										
GBU-54 Laser JDAM weapon system														●	
Surveillance and protection systems															
SIMONE infrared monitoring system															
J-MUSIC DIRCM system integration (Luftwaffe's A400M military aircraft)									●						

*ThyssenKrupp Marine Systems, ThyssenKrupp group

STRATEGIC HIGHLIGHTS

Business trends

- ▶ Diehl Defence, the defence division of German conglomerate Diehl (€3.7bn of turnover and 17,298 employees in 2018) is one of the leading European players in the missiles market. Diehl Defence accounted for 12.6% of Diehl's total revenues and 14.5% of the group's workforce in 2018.
- ▶ Diehl Defence net revenues reached €464m in 2018, increasing for the third consecutive year (+1.8%). Growth was mainly supported by missile sales (RAM Block 2, Sidewinder, Spike, PARS 3 LR missile systems).
- ▶ Diehl Defence is involved in many key programmes. Among others, it has partnered with Sweden's Saab AB for the production of the RBS15 Mk3 anti-ship missile, with Israel's Rafael for the production of the Spike anti-tank guided missile, and with Italy's Leonardo for the production of the Vulcano precision guided munition. The division has also set up an alliance with Lockheed Martin and Saab AB to develop the Falcon short- and medium-range air defence system (which includes Diehl Defence's IRIS-T SLM medium-range air-to-air missile), and with Safran for the development of the HUSSAR ultra-lightweight air-to-ground missile.
- ▶ In June 2019, Diehl Defence also partnered with Roxel France (Safran/MBDA JV), in the field of artillery rockets.

Home market

- ▶ A key supplier to the Bundeswehr, Diehl Defence expects to benefit from Germany's growing military spending to strengthen its position on its home market, where it generated 58% of its revenues in 2018.
- ▶ Diehl Defence won several contracts with the German Navy in 2018, including through a €79.5m contract to the RAMSYS consortium (a collaboration between Diehl Defence and MBDA) for the delivery of ten Rolling Airframe Missile (RAM) launching systems that will be installed and integrated on five new K130 Braunschweig-class corvettes, as well as a €17m contract (in collaboration with Saab AB) for the supply of RBS15 Mk3 anti-ship missile systems for the same corvettes.
- ▶ In June 2019, Diehl Defence won a contract to integrate Israeli defence company Elbit System's J-MUSIC Directed Infrared Counter Measure (DIRCM) systems on the German Air Forces' Airbus A400M aircraft.
- ▶ Germany's Armed Forces are considering purchasing VULCANO 155 mm ammunition jointly developed by Diehl Defence and Italy's Leonardo.
- ▶ Diehl Defence will contribute to the development and production of Europe's future fighter aircraft as part of the Next-Generation Weapon System (NGWS) programme. Together with MBDA, the company will in particular work on the new aircraft's weapon system. As part of its contribution to the NGWS programme, Diehl Defence has joined forces with Hensoldt, ESG and Rohde & Schwarz within the German consortium FCMS.

Export markets

- ▶ After having driven much the company's growth in 2016-2017, export sales markedly declined in 2018 (-5.8%), settling at less than €200m. Diehl Defence was largely affected by restrictions imposed by Germany's federal government on arms exports, in particular to the Middle East.
- ▶ In March 2019, Raytheon secured a \$92m (€81m) contract option to provide RAM Block 2 weapon systems to the U.S. Navy. Raytheon will manufacture these weapon systems with RAMSYS.
- ▶ In June 2019, Eurospike GmbH, a joint venture between Diehl Defence, Rheinmetall Defence and Rafael, secured a €40m contract with Estonia for the supply of Spike LR anti-tank missiles.
- ▶ As part of the United Arab Emirates' planned replacement of its Hawk air defence system provided by Lockheed Martin, the country might become the first client of the Falcon air defence system.

Technology and Innovation

- ▶ Diehl Defence's R&D investments are focused on the next-generation RBS15 anti-ship missiles jointly developed with Saab AB, as well as the modernisation of the RAM weapon system together with Raytheon.



BUSINESS AREAS

Platform manufacturer and systems integrator

- ▶ Naval shipbuilding (surface ships, submarines)
- ▶ Plant construction (offshore, chemical and power plants)
- ▶ Energy (wind power generation)

GOVERNANCE

Chairman and CEO
Chief Financial Officer

Sung Geun Lee
Keun Mo Lee

OWNERSHIP STRUCTURE (as of 20.11.2019)

Symbol	042660:KS
Listed on	Korea Stock Exchange
Market Cap (MdKRW)	2 851

Major shareholders* (as of 20.11.2019)

Korea Development Bank (KDB)	55,70%
Hana Financial Group, Inc.	8,41%
BlackRock Asset Management North Asia Ltd.	2,36%
Woori Financial Group Inc.	2,33%

*In March 2019, Hyundai Heavy Industries (HHI) signed an agreement with the Korea Development Bank (KDB) to repurchase KDB's capital share in DSME.

MAIN JOINT VENTURES AND ASSOCIATES

Name	%	Country
Shinhan Heavy Industry Co., Ltd	89,22%	South Korea

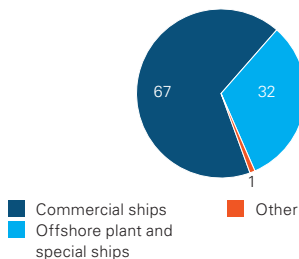
KEY FIGURES (Fiscal year ended: December 31st)

€ millions	2015	2016	2017	2018
Revenue	12 291	9 982	8 695	7 424
Δ (%) [KRW]*	-0,76%	-16,99%	-13,40%	-13,13%
Defence (%)	~8%	~12%	~9%	~8%
Export (%)	N/A	5%	3%	1%
Operating profit/loss	-1 691	-1 192	574	789
Operating margin (%)	-13,76%	-11,94%	6,60%	10,63%
Net income**	N/A	-2 129	487	265
Order book (USD)	42 700	34 000	24 000	23 000
Employees	52 619	34 006	27 692	26 927

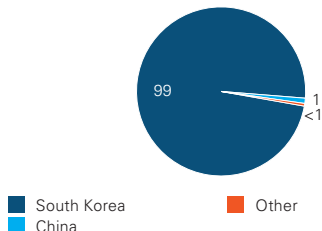
*Variation based on revenue in local currency. See € / KRW exchange rates p.7.

**Net income attributable to shareholders.

REVENUE BY BUSINESS LINE (%)



REVENUE BY REGION (%)*



*Revenue distribution based on total sales excluding eliminations.

MAIN PROGRAMMES, COOPERATIONS AND EXPORT PARTNERSHIPS

	Lockheed Martin	GE Aviation	Indra Sistemas	TKMS*	BMT Defence Services	Rolls-Royce	LIG Nex1	Thales	Hanwha	Raytheon	Saab AB	Atlas Elektronik**	Babcock	HHI
Surface ships														
KDX-II Chungmugong Yi Sun-sin destroyer	●	●				●	●		●					●
KDX-III Sejong Daewang destroyer	●	●			●	●	●		●					●
FFX-II Daegu-class frigate					●	●		●	●					●
DW 3000F frigate										●	●			
Multi-mission Combat Ship	●													
Tide-class tanker				●						●				
ASR-II submarine rescue ship (under development)														
Submarines														
KSS-III Dosan Ahn Changho submarine		●		●	●			●					●	●
KSS-II Son Won-II submarine (based on TKMS' HDW class 214)				●		●					●			●
KSS-I Nagapasa submarine (based on TKMS' HDW class 209)				●		●					●			
MRO and services														
KSS-I Chang Bogo (based on TKMS' HDW class 209) submarine modernisation				●										

*ThyssenKrupp Marine Systems, ThyssenKrupp group
 **TKMS subsidiary

STRATEGIC HIGHLIGHTS

Business trends

- ▶ Daewoo Shipbuilding & Marine Engineering (DSME) is one of South Korea's top 3 shipbuilding companies. Its defence business (8% of total revenue) focuses on the construction of surface vessels and submarines. In the civil segment, DSME has been increasingly focusing on the construction of natural gas carriers (LNGC) - which accounted for 52% of its revenue in 2018 - to cope with the enduring crisis of the container shipping market.
- ▶ DSME revenues again fell in 2018 (-13.1%), reaching KRW 9,644bn (€7.4bn), a level comparable to its performance in the late 2000s. Net income was nevertheless positive for the second consecutive year, reaching KRW 1,025bn (€789m) after several years of heavy losses.
- ▶ Following a KRW 4,200bn (€3.3bn) bailout in 2015, DSME divested several of its subsidiaries, of which Daewoo Shipbuilding and Engineering Co in 2017. In 2018, the group also sold its 51% capital stake in Romanian shipyard Mangalia to Damen Group from the Netherlands for KRW 23.9bn (€18.2m).
- ▶ In March 2019, Hyundai Heavy Industries (HHI) signed an agreement with the Korea Development Bank (KDB) to repurchase KDB's 55.7% capital share in DSME for approximately \$1.8bn (€1.6bn). In turn, KDB is expected to take an interest in HHI's capital. In the end, HHI should hold 26% of a new holding regrouping HHI and DSME, with KDB owning a further 18%. DSME should nevertheless retain relative independence under the new structure.

Home market

- ▶ DSME is a key contractor of the Republic of Korea Navy (ROKN), along with Hyundai Heavy Industries with which it partners on several contracts, such as the KDX-III Sejong Daewang-class destroyers programme.
- ▶ DSME delivered the first FFX-II Daegu-class frigate to the ROKN in March 2018, and launched a second frigate (christened Gyeongnam) in June 2019. In the meantime, the company in November 2018 signed a KRW 632bn (€486m) contract for the delivery of two more FFX-II frigates to the ROKN.
- ▶ In December 2018, South Korea's Defense Acquisition Program Administration (DAPA) awarded a KRW 444bn (€342m) contract for the construction of a new auxiliary submarine rescue ship (ASR-II) for the ROKN, to be delivered by 2022.
- ▶ In April 2019, South Korea's Ministry of National Defense approved a KRW 3,900 (€3bn) contract for the construction of three new KDX-III Sejong Daewang-class destroyers as well as a KRW 3,400 (€2.6bn) contract for three new KSS-III Dosan Ahn Changho-class attack submarines. The KDX-III destroyers will be jointly built by Hyundai Heavy Industries and DSME.

Export markets

- ▶ In 2019, DSME delivered the third and last KSS-I Nagapasa-class attack submarine to the Indonesian Navy as part of a contract signed in 2011. The warship, christened Alugoro, was the first of its class to be built in partnership with Indonesian shipbuilding company PT PAL. At the same time, DSME was awarded a \$1.02bn (€903m) contract for the construction of three additional attack submarines in cooperation with PT PAL, to be delivered by 2026.
- ▶ In the same year, the group delivered the Tide-class replenishment-at-sea (RAS) tanker Maud to the Royal Norwegian Navy. The tanker was ordered in 2013 for NOK 1.32bn (€169m).
- ▶ DSME withdrew its bid for the construction of three new UK support vessels for the Royal Fleet Auxiliary (a branch of the Royal Navy) as part of the Fleet Solid Support (FSS) ship programme. A British consortium (comprising BAE Systems and Babcock International, among others), Spain's Navantia, and Japan Marine United remain in contention for the £1bn (€1.14bn) contract.

Technology and Innovation

- ▶ DSME's R&D expenditures amounted to KRW 62bn (€47m) in 2018, representing 0.6% of the group's revenue.



BUSINESS AREAS

Systems integrator/equipment supplier

- ▶ Military aircraft and helicopter systems
- ▶ Unmanned systems
- ▶ C4ISR systems
- ▶ ISR & Electro-optic systems, EW and SIGINT
- ▶ Land systems and artillery systems
- ▶ Cybersecurity
- ▶ Simulation and training

GOVERNANCE

Chairman	M. Federmann
Chief Executive Officer	B. Machlis
General Manager of Airborne Systems	Y. Shmueli

OWNERSHIP STRUCTURE (as of 20.11.2019)

Symbol	ESLT
Listed on	NASDAQ et TASE
Market Cap (\$m)	7 052

Major shareholders (as of 20.11.2019)

Michael Federmann	44,30%
1832 Asset Management LP	2,53%
Fidelity Management & Research Co.	2,30%
The Vanguard Group, Inc.	1,38%

MAIN JOINT VENTURES AND ASSOCIATES

Name	%	Country
UAV Tactical Systems Ltd (U-Tacs)	51%	United Kingdom
AEL Sistemas S.A.	75%	Brazil
Collins Elbit Vision Systems (CEVS, form. RECVS)	50%	United States
Opgal-Optronic Industries Ltd	50%	Israel
Halbit Avionics Pvt Ltd	26%	India
Adani Elbit Advanced Systems India Ltd	N/A	India

KEY FIGURES (Fiscal year ended: December 31st)

€ millions	2015	2016	2017	2018
Revenue	2 800	2 945	2 989	3 119
Δ (%) / \$)*	5,07%	4,89%	3,62%	9,06%
Defence (%)	97%	97%	97%	97%
Export (%)	80%	78%	78%	80%
Operating profit/loss**	242	275	287	248
Operating margin (%)**	8,64%	9,34%	9,60%	7,95%
Net income***	182	214	212	175
Order book	6 028	6 555	6 306	8 209
Employees	12 134	12 470	12 781	16 149

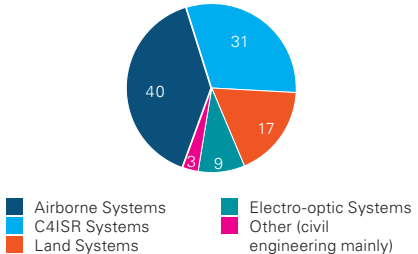
*Variation based on revenue in US dollars.

See €/\$ exchange rates p.7

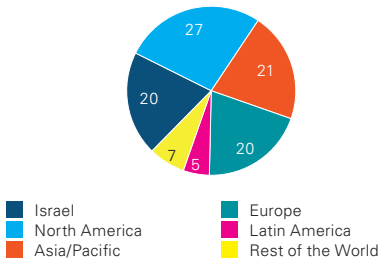
**2016 and 2017 figures restated.

***Net income attributable to shareholders.

REVENUE BY BUSINESS LINE (%)



REVENUE BY REGION (%)



MAIN PROGRAMMES, COOPERATIONS AND EXPORT PARTNERSHIPS

	HAL	Boeing	Thales	Diehl Defence	UAC	Collins Aerospace*	Electronica	Kraken Robotics	Embraer	Lockheed Martin	Leonardo	IAI
Military aircraft systems												
Avionic systems (F-16I, MiG-21)				●					●			
Modernisation projects (C-130, MiG-21, Mi-17, F-5, F-16, F/A-18, F-15)									●		●	
Joint Helmet Mounted Cueing System (JHMCS) (F-16, F/A-18, F-15)		●			●				●			
Helmet Display and Tracking System (HDTS, ANVIS/HUD)												
Helmet Mounted Display System (HMDS) (F-35)					●				●			
Unmanned systems												
Hermes (450, 900, 900 StarLiner, 45) UAS			●					●				
Skylark (I, I-LE/LEX, C, II, III) UAS	●											
Seagull USV							●				●	
C4ISR												
WIN Battle Management System (WinBMS)												
Tadiran and E-Lynx tactical radio and communication systems												
CoMPASS (MicroCoMPASS, DCoMPASS) and SPECTRO XR electro-optic payloads												
SkEye Wide Area Persistent Surveillance (WAPS)												
Electronic warfare												
J-MUSIC DIRCM countermeasure system				●			●		●			
Land systems and artillery systems												
RCWS, DRWS, UT30 and UT MK2 unmanned turrets												
ATMOS 155mm self-propelled howitzer												

*Formerly Rockwell Collins, UTC group

STRATEGIC HIGHLIGHTS

Business trends

- ▶ Elbit Systems is an Israeli systems and equipment manufacturer and the world's 28th-largest defence contractor by revenue. The group is in particular the world's leading manufacturer of helmet sights for aircraft pilots (HMDS Helmet-Mounted Display System for F-35 pilots, co-produced with Collins Aerospace) and helicopter pilots. The company generated turnover of \$3.7bn (€3.1bn) in 2018, up 9.1% year-on-year in US dollars. With 97% of its business in defence, Elbit Systems remains the leading Israeli defence company.
- ▶ The Airborne Systems segment, the group's largest division (40% of revenue), posted strong growth (+15%), mostly thanks to the acquisition of U.S.-based Universal Avionics Systems Corp., which develops avionics systems for civil aviation. The Land Systems division also posted growth, driven by the acquisition of Israel's IMI Systems Ltd (ammunition and protection systems for armoured vehicles).
- ▶ Elbit Systems' workforce increased by 26.4% in 2018 to more than 16,000 employees. The increase was mainly related to acquisitions made by the group, in particular those of IMI and Universal Avionics Systems.
- ▶ In April 2019, Elbit Systems of America completed the acquisition of Harris Corporation's night vision business (Harris Night Vision) for approximately \$350m (€311m). The group is now one of the world leading providers of night vision systems and might become the second supplier of these systems in the United States, alongside L3Harris Technologies.

Home market

- ▶ The Israeli market accounted for only 20% of Elbit Systems' revenue, a share that has been declining since 2010.
- ▶ In March 2019, the Israeli Ministry of Defense (IMOD) awarded Elbit Systems a \$125m (€111m) contract for the supply of ATMOS 155mm calibre self-propelled howitzers (which will replace the Israeli Army's M-109 guns), training simulators as well as maintenance services over a period of 20 years.
- ▶ In August 2019, Elbit Systems was selected by the Israeli Ministry of Defense to integrate the Iron Fist Light Decoupled (IFLD, developed by IMI) active protection system on the new Eitan armoured vehicles (for an undisclosed contract value). The group was in competition with the Trophy system from Israel's Rafael.

Export markets

- ▶ Nearly 80% of the group's sales (\$2.9bn, or €2.5bn) were generated from exports in 2018. Elbit Systems alone accounts for about 40% of Israel's arms exports in value terms.
- ▶ M7 Aerospace, one of Elbit Systems' subsidiaries in the United States, is one of the 19 players involved in the CMMARS (Contracted Maintenance, Modification, Aircrew and Related Services) programme worth \$12bn (€11.2bn). The group will provide maintenance and logistical support services for U.S. Army aircraft.
- ▶ In March 2019, Elbit Systems and India's Bharat Electronics Limited (BEL) signed a partnership agreement for the licensed production of HMDS (Helmet Mounted Display System) head-up sights by BEL.
- ▶ In June 2019, Elbit Systems was selected by the German Army to supply E-Lynx PNR-1000 military radios, in handheld and vehicular configurations. The radios will be used in particular on SPz Puma armoured infantry vehicles (produced by KMW, a KNDS subsidiary). Elbit Systems will produce the radios at its German site in Ulm.
- ▶ After a first contract signed in the summer of 2018 for the supply of Hermes 450 and Hermes 900 drones, Elbit Systems in August 2019 received a second, \$180m (€162m) order from the Philippines for Hermes 450, Hermes 900, Skylark I and Skylark III drones.

Technology and Innovation

- ▶ R&D expenses, 90% of which are self-financed, amounted to \$317.7m (€269m) in 2018.
- ▶ In the summer of 2019, Elbit Systems presented a prototype tank as part of the Israeli Ministry of Defense's CARMEL project to develop a next-generation combat vehicle to replace the Merkava tanks.



BUSINESS AREAS

Systems integrator/equipment supplier
(defence electronics)

- ▶ Military aircraft and helicopter systems
- ▶ Naval systems
- ▶ Land systems
- ▶ Electronic warfare suite
- ▶ Cybersecurity
- ▶ UAS and counter-UAV systems
- ▶ Support services and maintenance

GOVERNANCE

Chairman and CEO	Enzo Benigni
Chief Financial Officer	Roberto Turco
Vice President Programs	Alberto de Arcangelis

KEY FIGURES (Fiscal year ended: December 31st)

€ millions	2015	2016	2017	2018
Revenue	231	219	222	202
Δ (%)	4,66%	-5,23%	1,46%	-9,35%
Defence (%)	100%	100%	100%	100%
Export (%)	N/A	N/A	N/A	69%
Operating profit/loss	35	32	28	N/A
Operating margin (%)	14,94%	14,79%	12,66%	N/A
Net income	23	18	17	19
Order book	842	N/A	N/A	N/A
Employees	790	790	800	N/A

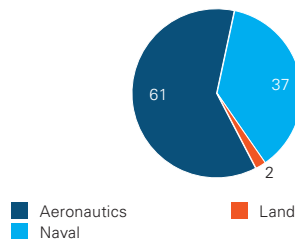
OWNERSHIP STRUCTURE

Symbol	
Listed on	Unlisted group
Market Cap	

Major shareholders (as of 20.11.2019)

Benigni Family	35,34%
Thales	33,33%
Leonardo	31,33%

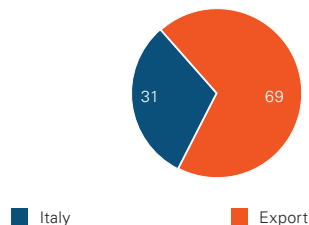
REVENUE BY BUSINESS LINE (%)



MAIN JOINT VENTURES AND ASSOCIATES

Name	%	Country
CY4GATE Srl	75,5%	Italy
Consortium SIGEN	50%	Italy
SOLYNX	24,11%	United States
Consorzio calcs Italia	7,14%	Italy
Consorzio per la Ricerca sui Semiconduttori Composti	4,14%	Italy

REVENUE BY REGION (%)



MAIN PROGRAMMES, COOPERATIONS AND EXPORT PARTNERSHIPS

	Leonardo	BAE Systems	MBDA	Indra Sistemas	Hensoldt	Elbit Systems	Lockheed Martin	Expert System Airbus
Military aircraft and helicopter systems								
Tempest future fighter aircraft	●	●	●					
Praetorian Defensive Aids Sub-System (DASS) (Eurofighter)	●	●		●	●			●
EDGE escort jamming pod (Eurofighter, Tornado)								
ELT/572 DIRCM (AW101, C-130J)					●	●		
ELT/160 radar warning receivers (NH90)								
ESM ELT/741 system (NH90, C-27J)								
ESM and ELINT ELT/800 systems (ATR-72)								
Naval systems								
Nettuno 4100 ECM system (Horizon-class and FREMM frigates, Cavour aircraft carrier)								
SEAL ESM system (Baynunah-class corvettes)								
Multiplatform system								
EuroDIRQM IR countermeasure system			●					
UAS systems								
European MALE RPAS subsystem (ISTAR)			●	●				
ESM/1000 and ELT/1001 systems (Falco, Camcopter, RQ7B Shadow)								
Counter-UAV system								
Anti-Drone Interception Acquisition Neutralization (ADRIAN)								
Electronic warfare suite								
Virgilius (PPA frigates, Baynunah-class corvettes, AW101 and A129 helicopters)								
Loki ELT/950								
Cybersecurity								
CY4Gate Digital & Spectrum Intelligence Integrated Suite (D-SINT)								●

STRATEGIC HIGHLIGHTS

Business trends

- ▶ Elettronica is an Italian electronic systems integrator and equipment supplier mainly focused on the defence sector. The group supplies systems for aeronautical, naval and land platforms (protection, detection, jamming systems, etc.), but also integrated electronic warfare systems and anti-drone systems.
- ▶ The group's revenue reached €202m in 2018, down 9.3% year-on-year, mainly due to reduced activity in certain programmes, such as the Eurofighter Typhoon fighter aircraft or the Alenia C-27J Spartan tactical transport aircraft, two programmes in which Elettronica participates as a subcontractor.
- ▶ After two years of decline, the group's net income rebounded by 10.7% to €19m in 2018. Net margin stood at 9.3%, one of its highest levels over the past decade.
- ▶ A cooperation agreement signed in September 2019 between the United Kingdom and Italy provides for the participation of Italian manufacturers (Elettronica, Leonardo Italy, Avio Aero, MBDA Italy) in the 6th-generation Tempest fighter aircraft programme, alongside the members of the Team Tempest consortium, which includes the United Kingdom's Ministry of Defence, BAE Systems, Rolls-Royce, MBDA UK and Leonardo UK.

Home market

- ▶ The group achieved a little more than 30% of its turnover on the Italian market in 2018. As a key partner of the main Italian platform manufacturers and systems integrators (Fincantieri and Leonardo above all), Elettronica also benefits, through them, from the Italian Navy's modernisation programme. In 2001, the group partnered with France's Thales to create the SIGEN joint venture, which was selected to supply the electronic warfare systems for the Horizon-class frigates as well as the FREMM frigates of the Italian and French Navies.
- ▶ Elettronica is also involved in major national and cooperation-based programmes in the aeronautics sector (Eurofighter fighter aircraft, AW-101 helicopter, C-27J military transport aircraft, NH90 twin-engine helicopter).
- ▶ In April 2018, Elettronica signed a contract with the Italian Army to equip the NH90TTH helicopters (land version) with ELT/160 radar warning receivers. The value of the contract was not disclosed.

Export markets

- ▶ Nearly 70% of the group's sales are generated from exports, particularly within the framework of major international programmes. This share has overall remained stable in recent years.
- ▶ Due to the relatively small size of its domestic market, Elettronica is seeking to strengthen its international activity, particularly through partnerships. In February 2019, the Italian group signed a memorandum of understanding with India's Bharat Electronics Limited (BEL), a key partner of the Indian Ministry of Defence, for the development, production and marketing of next-generation electronic warfare systems.
- ▶ At the Electronic Warfare (EW) exhibition in Stockholm, the company's German subsidiary Elettronica GmbH joined forces with Germany's Sphera, a former Airbus subsidiary sold in 2014, to cooperate in the field of electronic warfare systems for helicopters. The systems developed by the two partners could be offered to the German Army and then possibly to other export markets.

Technology and Innovation

- ▶ The group's R&D expenditure increased 10.1% to €11m in 2018. Spending was mainly focused on the new EDGE jamming system as well as cybersecurity solutions.
- ▶ At the end of 2019, the EuroDASS consortium, led by Leonardo and including Elettronica, Indra Sistemas and Hensoldt, was tasked with studying the possibilities of upgrading the Praetorian Defensive Aids Sub System (DASS) integrated on the Eurofighter Typhoon. The research programme, called Praetorian Long Term Evolution (LTE), is expected to last 18 months.



BUSINESS AREAS

Platform manufacturer and systems integrator

- ▶ Commercial and military aircraft (light, transport and surveillance)
- ▶ Radar systems
- ▶ C4ISR systems
- ▶ Space systems

GOVERNANCE

Chairman	A. Gonçalves Silva
Chief Executive Officer	F. Gomes Neto
Chief Financial Officer	N. Salgado
President and CEO	J. M. de F. Schneider
Defence & Security	

OWNERSHIP STRUCTURE (as of 20.11.2019)

Symbol	ERJ, EMBR3
Listed on	NYSE et B3SA3
Market Cap (\$m)	3 040

Major shareholders (as of 20.11.2019)

Mondrian Investment Partners Ltd.	9,94%
BNDES Participações SA	5,37%
Hotchkis & Wiley Capital Management LLC	5,04%
Brandes Investment Partners LP	4,45%

MAIN JOINT VENTURES AND ASSOCIATES

Name	%	Country
OGMA-Indústria Aeronáutica de Portugal S.A.	65%	Portugal
Visiona Tecnologia Espacial S.A.	51%	Brazil
Boeing Brasil-Commercial	20%	Brazil
Boeing Embraer-Defense	51%	N/A

KEY FIGURES (Fiscal year ended: December 31st)

€ millions	2015	2016	2017**	2018
Revenue	5 341	5 604	5 185	4 294
Δ (%)/[\$]**	-5,74%	4,65%	-5,55%	-13,45%
Defence (%)	14%	13%	15%	12%
Export (%)	89%	89%	87%	81%
Operating profit/loss	299	193	303	30
Operating margin (%)	5,59%	3,44%	5,84%	0,70%
Net income***	62	161	234	-151
Order book	20 625	18 617	15 294	14 236
Employees	19 373	18 506	18 433	18 520

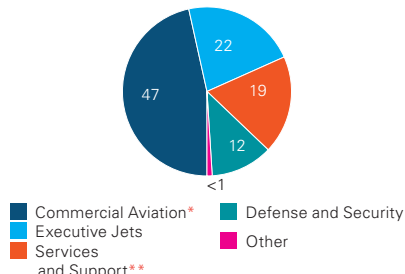
*Variation based on revenue in dollars.

See €/€ exchange rates p.7.

**2017 figures restated.

***Net income attributable to shareholders.

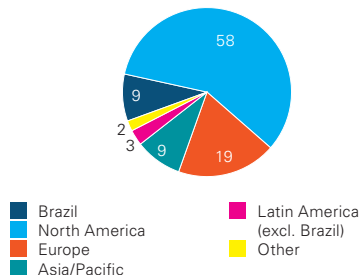
REVENUE BY BUSINESS LINE (%)



*Commercial Aviation business taken over by Boeing in July 2018.

**Services and support business reported as a separate division since 2018.

REVENUE BY REGION (%)



MAIN PROGRAMMES, COOPERATIONS AND EXPORT PARTNERSHIPS

	Boeing	Elbit Systems	Sierra Nevada Corp.	DRDO*	Teledras	Saab AB	BAE Systems	CTEX**	Thales Alenia Space	Collins Aerospace***	Eita Aerospace****	TKMS*****	Cobham	Safran
Light attack and advanced trainer														
EMB-314 (A-29) Super Tucano	●	●	●											
A-4 Skyhawk modernisation programme														
A-1M (AMX) modernisation programme														
Fighter aircraft														
FX-2 programme (Gripen JAS-39 E/F)		●				●								
Airborne early warning and control aircraft														
EMB-145 AEW&C				●										
P600 AEW (under development)											●			
Military transport aircraft														
KC-390	●	●					●			●			●	●
Radar and C4ISR systems														
SABER-M60, SABER M200, SABER-S200 surveillance radars								●						
SISFRON integrated border monitoring system programme		●				●				●				
Satellite														
SGDC-1 Geostationary Satellite for Communications and Defense					●			●						
Naval systems														
Tamandaré-class corvettes													●	●

*Defence Research and Development Organization (India)

**Centro Tecnológico do Exército

***Formerly Rockwell Collins, UTC group

****Israel Aerospace Industries (IAI)

*****ThyssenKrupp Marine Systems, ThyssenKrupp group

STRATEGIC HIGHLIGHTS

Business trends

- ▶ Embraer is a Brazilian aerospace and defence group that specialises in aircraft manufacturing. The group generated \$5.1bn (€4.3bn) in revenue in 2018, down 13.5% year-on-year in local currency. Sales were affected by lower activity in its three major divisions: Commercial aviation (-14.9%), Business jets (-13.7%), and Defense & Security (-28.3%). The share of the Defense & Security division in total sales decreased from 16% in 2017 to 12% in 2018.
- ▶ After a first incident in October 2017, Embraer's KC-390 military cargo jet prototype was again damaged after going off a runway during a May 2018 ground test. The incidents significantly weighed on revenues from the Defense & Security division, mostly due to delays caused in deliveries, which were initially set for late 2018 but eventually began in September 2019.
- ▶ In early 2019, the Brazilian government and Embraer shareholders approved a proposed deal to merge Embraer's commercial aviation division into a new joint venture with Boeing, which will own 80% in the new company called Boeing Brasil – Commercial. Both companies expect the deal to obtain final approvals and be finalised before the end of 2019.
- ▶ Embraer and Boeing are also planning to set up a second joint venture called Boeing Embraer-Defense (in which Embraer will hold a 51% capital stake and Boeing 49%) aimed at promoting the KC-390 military cargo jet.

Home market

- ▶ Embraer's Defense & Security division remains very reliant on Brazil's defence spending, with about half of the division's revenue generated in the country. This share has nevertheless been declining, dropping from 66.3% in 2017 to 48.1% in 2018. The group has been the main beneficiary of Brazil's major defence programmes launched over the past decade (Super Tucano, KC-390, FX-2 Gripen, SISFRON, SGDC).
- ▶ In early 2019, Águas Azuis, a consortium between TKMS, Embraer and Atech, won a tender for the construction of four new Tamandaré-class corvettes for the Brazilian Navy, with delivery scheduled between 2024 and 2028. The consortium won the contract, worth an estimated \$1.6bn (€1.4bn), against competing alliances led by Damen, Fincantieri and Naval Group, respectively. MBDA will supply the Exocet MM40 B1/B3 and Sea Ceptor missiles, with Safran, Leonardo, BAE Systems and Thales providing other equipment.
- ▶ In September 2019, Sweden's Saab AB finalised the assembly of the first of 36 Gripen fighter jets ordered by Brazil as part of the FX-2 fighter aircraft programme. The aircraft is scheduled to be delivered to Brazil by the end of 2020 following the completion of flight tests in Sweden. As part of the programme, Embraer will benefit from significant technology transfers from Saab AB, which will train over 350 Brazilian technicians and engineers.

Export markets

- ▶ Export sales were driven by the Super Tucano light attack aircraft, the EMB-145 AEW&C warning and control aircraft, and more recently by the KC-390 military cargo jet.
- ▶ In early 2019, Embraer and its U.S. partner Sierra Nevada Corporation were awarded a contract for the construction of 12 Super Tucano A-29 for the Nigerian Air Force.
- ▶ In June 2019, Embraer and Elta Systems, a subsidiary of IAI, signed a strategic cooperation agreement for the development of the P600 AEW, an airborne early warning aircraft based on Embraer's Praetor 600 business jet.
- ▶ In August 2019, Embraer signed its first export contract for the KC-390 with Portugal, which ordered five units of the military cargo jet. The \$827m (€738m) contract includes the supply of a flight simulator and related support services. The first unit is scheduled to be delivered in 2023. Argentina, Chile, Colombia and the Czech Republic are also among potential customers following the signatures of letters of intent.

Technology and Innovation

- ▶ Embraer's R&D spending decreased 6.3% to \$46.1m (€39m) in 2018.



DOMAINES D'ACTIVITÉS

Platform manufacturer and systems integrator

- ▶ Naval shipbuilding (commercial and military)
- ▶ Offshore
- ▶ Naval equipment and systems (propulsion systems, guidance systems)
- ▶ Maintenance and services

GOVERNANCE

Chairman	G. Massolo
Chief Executive Officer	G. Bono
General Manager Naval Vessels	G. Giordo

OWNERSHIP STRUCTURE (as of 20.11.2019)

Symbol	FCT
Listed on	Borsa Italiana
Market Cap (€m)	1 653

Major shareholders (as of 20.11.2019)

Fintecna S.p.A (state-owned)	71,30%
Norges Bank Investment Management	2,20%
Dimensional Fund Advisors LP	0,84%
The Vanguard Group, Inc.	0,76%

MAIN JOINT VENTURES AND ASSOCIATES

Name	%	Country
Orizzonte Sistemi Navali S.p.A	51%	Italy
Etihad Ship Building LLC	35%	UAE
Marinette Marine Corp.	87,44%	United States
Centro Per Gli Studi Di Tecnica Navale Cetena S.p.A	86,10%	Italy
Vard Holdings Ltd	97,22%	Singapore
Naviris	50%	Italy

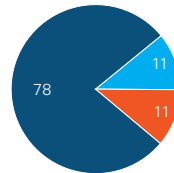
KEY FIGURES (Fiscal year ended: December 31st)

€ millions	2015	2016	2017	2018
Revenue	4 183	4 429	5 020	5 474
Δ (%)	-4,91%	5,88%	13,34%	9,04%
Defence (%)*	25%	26%	24%	26%
Export (%)	85%	84%	85%	82%
Operating profit/loss	-137	157	221	277
Operating margin (%)	-3,28%	3,54%	4,40%	5,06%
Net income**	-175	25	57	72
Order book	15 721	18 231	22 053	25 524
Employees	20 019	19 181	19 545	19 274

*Naval vessels revenue.

**Net income attributable to shareholders.

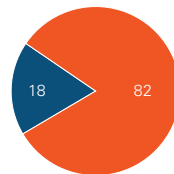
REVENUE BY BUSINESS LINE (%)*



■ Shipbuilding
■ Offshore
■ Equipment, Systems and Specialized Vessels and Services

*Revenue distribution based on total sales excluding eliminations.

REVENUE BY REGION (%)



■ Italy
■ Rest of the World

MAIN PROGRAMMES, COOPERATIONS AND EXPORT PARTNERSHIPS

	TKMS*	Thales	LMG Marin	Gibbs & Cox	Lockheed Martin	Naval Group	Leonardo	Chantiers de l'Atlantique	General Electric	Appledore Shipyard**	Electronica	Renk
Surface ships												
PPA multi-purpose Offshore Patrol Vessel (OPV)							●					
Multi-role corvette (export markets)							●					
Horizon-class frigate	●				●	●		●				
FREMM multi-purpose frigate	●				●	●		●				●
Freedom-class Littoral Combat Ship (LCS) frigate			●	●								
Cavour aircraft carrier							●					
San Giusto-class Landing Platform Dock (LPD)							●				●	
Trieste-class Landing Helicopter Dock (LHD)							●					
Vulcano-class Logistic Support Ship (LSS)								●				
French Navy's future LSS (BRF, FLOTLOG programme)***	●				●		●					
Samuel Beckett-class OPV										●		
Norwegian Coast Guard's Jan Mayen-class vessel			●									
MMSC frigate (Multi-Mission Surface Combatant)				●	●							
Submarine												
U212A Todaro-class submarine (under TKMS licence)	●											
Propulsion systems and guidance systems												
Propeller propulsion system and shaft lines												
Propulsion systems												
Rudder roll governance and stabilization system												
Turbines							●					
Stabilization and positioning systems												

*ThyssenKrupp Marine Systems, ThyssenKrupp group **Babcock group, naval shipyard which closed in November 2018 after last Samuel Beckett-class OPV delivery ***Based on Italian Navy's Vulcano-class LSS

STRATEGIC HIGHLIGHTS

Business trends

- ▶ Fincantieri, Italy's leading naval group, is the world's largest civil shipbuilding company (cruise ships, ferries, yachts), with a market share of nearly 40% in 2018. The company is also active in the naval defence sector, where it operates as the prime contractor for the Italian Navy's main programmes (naval surface vessels, special vessels, submarines under German licence, naval systems, etc.).
- ▶ Fincantieri's turnover increased for the fourth consecutive year in 2018, reaching nearly €5.5bn, although growth slightly slowed compared to the previous year (+9% year-on-year in 2018 compared to +13.3% in 2017). The group's three divisions all contributed to growth. The Shipbuilding division, Fincantieri's main division (€4.7bn, or 78% of total revenue), reported a 9.6% increase, in particular thanks to a good performance in the naval defence sector (+18.3% in 2018).
- ▶ After the acquisition of a majority stake in 2013 and a first ownership increase in 2017, Fincantieri again increased its capital stake in Norwegian shipbuilding company Vard, from around 85% to 97.22%, as part of an unconditional bid. Following this increase, Fincantieri delisted Vard from the Singapore Stock Exchange.
- ▶ Announced at Euronaval 2018, the alliance between France's Naval Group and Fincantieri (Poseidon project) was formalised in June 2019. The alliance should in particular enable the two groups to carry out common R&D projects and jointly prepare surface vessel bids for binational programmes and export markets. A 50:50 joint venture, called Naviris, was created at the end of the year, with its headquarters in Genoa (Italy) and a site in France (Olioules).

Home market

- ▶ A key player in the Italian shipbuilding sector, Fincantieri (nine shipyards and nearly 8,700 employees in Italy) nevertheless generates only a minor share of its turnover on its domestic market (18% in 2018).
- ▶ In April 2019, Fincantieri delivered the 8th of the 10 FREMM multi-purpose frigates ordered by the Italian Navy as part of a French-Italian cooperation programme. Named Antonio Marceglia, the frigate was built on the Muggiano shipyard. The last FREMM frigate (Spartaco Schergat) is scheduled for delivery in 2020.
- ▶ The Trieste-class Landing Helicopter Dock (LHD) ordered by the Italian Navy was launched at the Castellamare di Stabia shipyard in May 2019. The vessel is expected to be delivered in 2022.

Export markets

- ▶ Export turnover accounted for 82% of the group's revenue in 2018. Thanks to its subsidiaries Marinette Marine and Vard (formerly STX OSV), the group is well positioned in the United States and Northern Europe (Ireland, Nordic countries).
- ▶ Fincantieri aims to further strengthen its international presence, particularly through partnerships. In addition to the alliance concluded with Naval Group (Poseidon project), the group finalised an agreement with Abu Dhabi Shipbuilding (ADSB), the United Arab Emirates' (UAE) leading shipbuilder, for commercial and industrial cooperation in the UAE's civil and military shipbuilding sector.
- ▶ In June 2018, Vard won a NOK 5bn (€550m) contract from the Norwegian Defence Materiel Agency (NDMA) for the construction of three coastguard vessels that will replace the Nordkapp, Senja and Andenes-class vessels. The vessels, whose class name will be Jan Mayen, will be built at Vard's Tulcea (Romania) and Langsten (Norway) shipyards, in partnership with Norway's LMG Marin, in charge of the design.
- ▶ As part of the LCS (Littoral Combat Ship) programme, the U.S. Navy ordered two new Freedom-class LCSs (one in September 2018, the other in January 2019) from Lockheed Martin and its partner Marinette Marine, making it the 15th and 16th orders of this class. Financial details were not disclosed.

Technology and Innovation

- ▶ The group's R&D expenditure amounted to €122m in 2018, up 8% year-on-year.



BUSINESS AREAS

Platform manufacturer and systems integrator

- ▶ Unmanned aircraft systems
- ▶ Sensors
- ▶ Weapon systems
- ▶ Electromagnetic systems, advanced arresting gear
- ▶ Satellites and space systems
- ▶ Nuclear engineering

GOVERNANCE

Chairman and CEO
Chief Financial Officer
CEO GA-ASI

James N. Blue
Liam Kelly
Linden P. Blue

OWNERSHIP STRUCTURE

Symbol
Listed on
Market Cap

Unlisted group

Major shareholders (as of 20.11.2019)

Blue Family | 100%

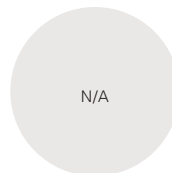
MAIN JOINT VENTURES AND ASSOCIATES

Name	%	Country
ConverDyn	50%	United States
TRIGA International	50%	United States

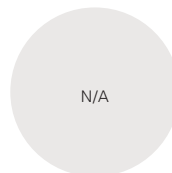
KEY FIGURES (Fiscal year ended: December 31st)

€ millions	2015	2016	2017	2018
Revenue	~2 704	~2 710	~2 572	~2 440
Δ (%)	N/A	N/A	N/A	N/A
Defence (%)	N/A	N/A	N/A	N/A
Export (%)	N/A	N/A	N/A	N/A
Operating profit/loss	N/A	N/A	N/A	N/A
Operating margin (%)	N/A	N/A	N/A	N/A
Net income	N/A	N/A	N/A	N/A
Order book	N/A	N/A	N/A	N/A
Employees	N/A	N/A	N/A	15 000

REVENUE BY BUSINESS LINE (%)



REVENUE BY REGION (%)



GENERAL ATOMICS

MAIN PROGRAMMES, COOPERATIONS AND EXPORT PARTNERSHIPS

	Boeing	Lockheed Martin	Northrop Grumman	BAE Systems	Leonardo	Pratt & Whitney*	Huntington Ingalls	L3Harris Technologies**	GKN	QinetiQ	Raytheon	Honeywell	Senor
Unmanned aircraft systems													
Predator XP													
Gray Eagle MQ-1C and Gray Eagle Extended Range (GE-ER)	●	●	●							●			
Predator B/Reaper MQ-9							●	●		●	●	●	
Skyguardian and Seaguardian MQ-9B				●				●		●	●		
Avenger/Predator C					●					●			
Sensors													
Lynx multi-mode radar													
Highlighter I and II airborne electro-optical sensors (under development)													
Claw 3 integrated sensor payload control and analysis software													
Weapon systems													
High Energy Liquid Laser Area Defense System (HELLADS)		●											
Blitzer electromagnetic railgun (under development)	●												
Aircraft launch and recovery systems													
Electromagnetic Aircraft Launch System (EMALS)							●			●			
Advanced Arresting Gear (AAG)							●			●			
Ground control stations													
Legacy GCS, STORM GCS and Advanced Cockpit GCS													

*UTC group

**Merger of L3 Technologies and Harris Corporation

STRATEGIC HIGHLIGHTS

Business trends

- ▶ General Atomics is an American industrial corporation specialising in defence (drones, electromagnetic weapon systems, etc.) and energy systems (in particular nuclear technology). The group's revenues reached \$2.88bn (€2.44bn) in 2018, a slight decrease compared to the previous year.
- ▶ General Atomics benefits from several military Unmanned Aircraft System (UAS) orders and related maintenance contracts by the U.S. Air Force and several European armed forces. As of February 2019, the group manufactured over 850 combat drones and more than 300 ground control stations.
- ▶ The group signed various partnerships in the field of drone technology during 2018-2019, including with GKN to collaborate on composite tails for the Predator B Remotely Piloted Aircraft (RPA) series; with Leonardo to integrate the latter's SAGE electronic warfare surveillance system onto the MQ-9B Sky Guardian and Sea Guardian drones; and with CAE to develop a simulation system for the Protector RG Mk1 remotely piloted aircraft system (RPAS) of the U.K.'s Royal Air Force.

Home market

- ▶ General Atomics is the leader in the U.S. market for MALE combat drones via its Predator and Reaper systems.
- ▶ In August 2018, the group signed a \$134m (€113m) contract with the U.S. Air Force for the development of an advanced sensor for the MQ-9 Reaper drones by the end of 2021. In late 2018, the group signed a \$291m (€246m) maintenance contract for MQ-9 Reaper drones until the end of 2019.
- ▶ During the first half of 2019, General Atomics signed three contracts with the U.S. DoD, for a total value of \$201m (€178m), to provide logistics support services for the MQ-1C Gray Eagle UAS.
- ▶ In September 2019, the Naval Surface Warfare Center, Carderock Division (NSWCDD) selected General Atomics to supply two large Bearing Support Structures (BSS) to be used in the construction of the U.S. Navy's Columbia-class submarines.
- ▶ In October 2019, General Atomics was awarded a contract from Dynetics Technical Solutions (DTS) to provide subassemblies for the Common Hypersonic Glide Body (C-HGB) weapons systems destined for the U.S. Army.

Export markets

- ▶ The group's export strategy has been constrained by the U.S. government's ITAR (International Traffic in Arms Regulations) and MCTR (Missile Technology Control Regime) arms exports control regulations. International sales are mainly carried out through the Foreign Military Sales (FMS) programme and generally on the basis of unarmed systems.
- ▶ General Atomics strengthened its position in Europe, where its MQ-9 Reaper drone is already in service within the air forces of Britain, Spain, France and Italy. In March 2019, the U.S. Department of Defense awarded General Atomics a \$123m (€109m) contract - via the FMS programme - to supply four MQ-9 Reaper drones and four mobile ground control stations to the Netherlands by the end of 2020. The U.S. government also approved a \$600m (€530m) order from Belgium for four unarmed MQ-9B Sky Guardian drones, two ground control stations, spare parts as well as support equipment for a period of 5 years. As part of the contract's offset agreements, General Atomics will partner with several Belgian suppliers including SABCA, Thales Belgium, Esterline, Newtec and DronePort.
- ▶ Discussions are underway between the governments of India and the U.S. over the sale of MQ-9B Sea Guardian surveillance drones to the Indian Navy, as well as armed configurations of the drone to the country's land forces. The contract might include the sale of 22 drones for a total estimated amount of \$2bn (€1.7bn).

Technology and Innovation

- ▶ The group is pursuing several R&D programmes, including in the fields of Predator drone modernisation, advanced propulsion systems for underwater drones, lithium-ion batteries, and high energy density capacitors.



BUSINESS AREAS

- Platform manufacturer and systems integrator
- ▶ Commercial aircraft (Gulfstream, Jet Aviation)
 - ▶ Armoured vehicles
 - ▶ Weapon systems, artillery systems, ammunition
 - ▶ Naval (surface ships and submarines)
 - ▶ C4ISR
 - ▶ IT solutions and cybersecurity

GOVERNANCE

Chairwoman and CEO	Phebe N. Novakovic
Chief Financial Officer	Jason W. Aiken
Executive VP Marine Systems	Robert E. Smith

OWNERSHIP STRUCTURE (as of 20.11.2019)

Symbol	GD
Listed on	NYSE
Market Cap (\$m)	53 866

Major shareholders (as of 20.11.2019)

Longview Asset Management LLC	11,40%
Capital Research & Management Co.	10,80%
Capital Research & Management Co. (Global Investors)	9,07%
Evercore Trust Company, NA	7,50%
Newport Trust Co.	6,95%

MAIN JOINT VENTURES AND ASSOCIATES

Name	%	Country
GR Dynamics LLC	50%	United States
Defense Munitions International LLC	50%	United States
American Powder Company	50%	United States
GD Mission Systems International Middle East	N/A	UAE
Range Generation Next	50%	United States

KEY FIGURES (Fiscal year ended: December 31st)

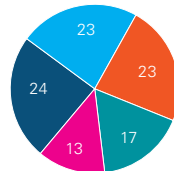
€ millions	2015**	2016**	2017	2018
Revenue	28 632	27 607	27 410	30 646
Δ (%)/\$)*	23,34%	-3,84%	1,35%	16,85%
Defence (%)	60%	64%	63%	62%
Export (%)	26%	24%	24%	21%
Operating profit/loss	4 049	3 382	3 749	3 374
Operating margin (%)	14,14%	12,25%	13,68%	12,31%
Net income	2 735	2 323	2 577	2 832
Order book	62 246	59 019	52 690	59 276
Employees	99 900	98 800	98 600	105 600

*Variation based on revenue in local currency.

See €/€ exchange rates p.7

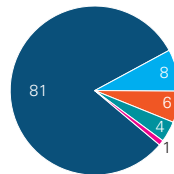
**2015 and 2016 figures restated.

REVENUE BY BUSINESS LINE (%)



- Marine Systems
- Aerospace
- Information Technology
- Combat Systems
- Mission Systems

REVENUE BY REGION (%)



- North America
- Europe
- Asia/Pacific
- Africa and Middle East
- South America

GENERAL DYNAMICS

MAIN PROGRAMMES, COOPERATIONS AND EXPORT PARTNERSHIPS

	Austal	Rafael	Thales	Northrop	Grumman	Huntington	Raytheon	Collins	Lockheed*	L3Harris	Martin	BAE Systems	Honeywell**	IAI
Aircraft														
Gulfstream special mission aircraft														●
Submarines														
Virginia-class nuclear-powered attack submarines (SSN)			●	●										
Ohio-class ballistic missile submarines (SSBN) (to be replaced by Columbia-class from 2021)			●	●										
Surface ships														
Zumwalt-class destroyer (DDG-1000)			●	●	●			●		●				
Arleigh Burke-class destroyer (DDG-51)			●	●	●			●		●				
Military vehicles														
Abrams M1A1, M1A2 and M1A2C main battle tanks	●													●
PIRANHA armoured infantry fighting vehicle														
Stryker armoured infantry fighting vehicle			●		●									
AJAX (Scout SV) UK programme		●			●			●						
Mobile Protected Firepower light tank											●			
Weapons, artillery systems, ammunition														
SAMSON remote controlled weapon station	●													
Hydra-70 family of rockets (70mm)														
Mission systems and C4ISR														
Bowman and Morpheus C4I systems							●		●	●				
Warfighter Information Network-Tactical (WIN-T)							●	●	●	●				
Open architecture computing infrastructure OPEN CI (LCS frigates)	●													
Common Hardware Systems-5 (CHS-5) programme														

*Formerly Rockwell Collins, UTC group **Merger of L3 Technologies and Harris Corporation

STRATEGIC HIGHLIGHTS

Business trends

- ▶ General Dynamics is a U.S.-based platform producer and systems integrator and the world's sixth-largest defence contractor by sales. The group has a diversified portfolio of activities spanning commercial aviation (Gulfstream, Jet Aviation), armoured combat vehicles (General Dynamics Land Systems), artillery systems and ammunitions, surface ships and submarines (Electric Boat, Iron Works), as well as mission systems and cybersecurity, among others.
- ▶ General Dynamics revenue reached \$36.2bn (€30.6bn) in 2018, a 16.9% year-on-year increase in local currency. Growth was mainly driven by the April 2018 takeover of CSRA, an American IT services company that generated \$5bn (€4.4bn) in revenues during 2017. Excluding the purchase, revenue growth stood at 5% during the year.
- ▶ Following the acquisition of CSRA, General Dynamics split its Information Systems and Technology division into two new divisions: Information Technology (encompassing CSRA) and Mission Systems. As a consequence, the group is now organised around five divisions. Although all of them are involved in the defence business, the share of defence activities varies strongly by division (95% of sales in the Combat Systems division, compared to 10% in Aerospace for example).
- ▶ In November 2018, General Dynamics European Land Systems (GDELS, a General Dynamics subsidiary attached to the Combat Systems division) acquired Germany's FVW Fahrzeugwerk GmbH, a qualified vehicle maintenance and service provider for the German Army that has 220 employees.

Home market

- ▶ The United States remain by far General Dynamics' core market, accounting for about 80% of its revenue in 2018. The group is in particular a key contractor for the U.S. Department of Defense.
- ▶ In August 2018, the group won a \$3.9bn (€3.3bn) contract from the U.S. Army to supply military equipment as part of the Common Hardware Systems-5 (CHS-5) Program.
- ▶ During 2018-2019, the Marine Systems division signed several contracts with the U.S. Navy, including one for five DDG-51 Arleigh Burke-class destroyers (total contract value of \$4.8bn, or €4.1bn), one for 10 Virginia-class attack submarines (Block V, total contract value of \$2bn, or €1.8bn), and one for further development of the upcoming Columbia-class ballistic missile submarines (contract value of \$480.6m, or €412.4m). General Dynamics' Electric Boat subsidiary, which will be the programme's prime contractor, will handle most of the production and assembly of the submarines, with Huntington Ingalls Industries involved as a subcontractor.
- ▶ General Dynamics Land Systems won two contracts of \$1.36bn (€1.2bn) each for the provision of various modernisation, repair and logistics services for the U.S. Army's Stryker-class armoured fighting vehicles over a period of five years. The U.S. Army also awarded the group a \$714m (€626m) contract to upgrade a further 174 Abrams-type M1A1 main battle tanks to the M1A2C configuration, raising the number of M1A2C vehicles ordered by the U.S. Army to 274 units.

Export markets

- ▶ General Dynamics generated 21% of its revenue from export sales. The group has a strong position in Europe (Austria, Czech Republic, Denmark, Germany, Romania, Spain, Switzerland, United-Kingdom) thanks to its General Dynamics European Land Systems (GDELS) subsidiary and its British subsidiary GD UK.
- ▶ General Dynamics has in particular been tasked by the UK Ministry of Defence to design and develop the next-generation tactical communication and information system as part of MORPHEUS programme.
- ▶ In early 2018, the group won a \$1bn (€0.8bn) contract to deliver 227 Piranha-class armoured fighting vehicles to the Romanian Land Forces. Spain and the Czech Republic are also considering orders for Piranha-type vehicles.

Technology and Innovation

- ▶ General Dynamics' self-funded R&D expenditures represented 1.4% of total revenue in 2018.



GENERAL ELECTRIC AVIATION (GE AVIATION)

BUSINESS AREAS

Engine manufacturer, systems integrator/equipment supplier

Subsidiary of General Electric (GE) conglomerate

- ▶ Commercial and military propulsion systems (fighter aircraft, transport aircraft and helicopter engines, gas turbines)
- ▶ Aircraft systems and equipment (avionics, electrical power, structures, dowty propellers)
- ▶ Support services and maintenance solutions

GOVERNANCE

Chairman and CEO
Chief Financial Officer
CEO Military Systems

David L. Joyce
Shane Wright
Tony Mathis

OWNERSHIP STRUCTURE

Symbol

Listed on

Unlisted subsidiary

Market Cap

Major shareholders (as of 20.11.2019)

General Electric | 100%

MAIN JOINT VENTURES AND ASSOCIATES

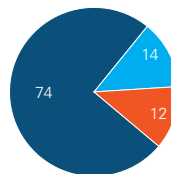
Name	%	Country
CFM International	50%	United States
NGS Advanced Fibers	25%	Japan
TUSAS Engine Industries	46%	Turkey
Advanced Ceramic Coatings	50%	United States
GE Aviation / Woodward	50%	United States

KEY FIGURES (Fiscal year ended: December 31st)

€ millions	2015	2016	2017	2018
Revenue	22 216	23 704	23 905	25 881
Δ (%)/[\$]*	2,79%	6,41%	2,95%	13,15%
Defence (%)	15%	13%	15%	14%
Export (%)	61%	60%	60%	59%
Operating profit/loss	4 961	4 809	4 752	5 475
Operating margin (%)	22,33%	20,29%	19,88%	21,15%
Net income	N/A	N/A	N/A	N/A
Order book	138 843	146 584	166 972	195 197
Employees	44 000	45 000	44 500	48 000

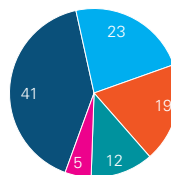
*Variation based on revenue in local currency.
See €//\$ exchange rates p.7.

REVENUE BY BUSINESS LINE (%)



■ Commercial Engines & Services
■ Military
■ Systems & Other

REVENUE BY REGION (%)



■ United States
■ Europe
■ Asia
■ Africa and Middle East
■ Americas (excl. U.S.)

GENERAL ELECTRIC AVIATION (GE AVIATION)

MAIN PROGRAMMES, COOPERATIONS AND EXPORT PARTNERSHIPS

	HemWira Techwin	Safran	MTU Aero Engines	IHI	ITP	GKN	Transcanada Turbines	Aviastar*	Leonardo DRS**	HAL
Aircraft engines										
Adaptive Cycle Engine										
F110 (F-16C/D, F-15SG, F-15SA, F-15S, F-2)	●	●	●			●				
F404 (F/A-18C/D Hornet, F-117, T-50, Gripen NG)	●					●				
F414 (F/A-18E/F, EA-18G, Gripen JAS 39-E/F, Tejas Mk II)		●		●	●					
F108/CFM56-7B (Boeing AEW&C, P-8 Poseidon)	●									
F138/CF6 (C-5M, KC-10, B767 AWACS, A330 MRTT)	●									
Helicopter engines										
T700/CT7 (UH-60, AH-64D/E, NH90, Surion)	●		●	●			●			
T408 (formerly GE38) (CH-53K)		●								
T901 (AH-64, UH-60)										
Gas turbines										
GE LM2500 (FREM, Arleigh Burke, Cavour, INS Vikrant, USS Independence)	●	●	●			●	●	●	●	
Systems and aerostructures										
Landing gear systems (X-47B, T-38)										
Fuel tanks and pods (F/A-18, Eurofighter Typhoon)										
Refuelling probe (A400M)										
Pylons and aerostructures (P-8 Poseidon, HAWK AJT)										
Propellers (C-27J, C-130J, US-2, Saab 2000, Fokker 50/60, Q400)										

*Boeing group

**U.S. subsidiary of Leonardo

STRATEGIC HIGHLIGHTS

Business trends

- ▶ GE Aviation, a subsidiary of U.S. industrial conglomerate General Electric, is among the world's leading suppliers of jet engines for commercial and military aircraft. The company generated \$30.6bn (€25.9bn) in revenue in 2018, up 13.2% year-on-year. With all of its three business lines posting growth, GE Aviation is one of General Electric's strongest performing subsidiaries.
- ▶ Growth of the company's Commercial Engines & Services division (74% of GE Aviation's total revenue in 2018) was supported by strong sales of civil aircraft engines, in particular LEAP engines which are produced by CFM International, a joint venture between GE Aviation and Safran Aircraft Engines.
- ▶ Sales of the Military division were flat compared to 2017, reaching \$4.1bn (€3.5bn), or 14% of total revenue. The company shipped 674 military aircraft engines in 2018, compared to 617 in 2017.
- ▶ In June 2019, GE Aviation announced it would complete the transition of nearly 1,000 engineers from its commercial programmes to its military programmes by the end of 2020. The process is part of the company's efforts to meet the U.S. Army's need to upgrade and improve its fleet of Apache and Black Hawk helicopters as part of the Improved Turbine Engine Program (ITEP).

Home market

- ▶ GE Aviation generated 41% of its revenue in the United States in 2018. However, its military engine business (both in the aviation and marine segments) continues to rely strongly on orders from the U.S. Department of Defense.
- ▶ In February 2019, a decade after the launch of the ITEP programme, GE Aviation won a \$517m (€438m) design, engineering and manufacturing contract for the T901 turboshaft engine which will replace the T700 engines used on the U.S. Army's fleet of Apache and Black Hawk helicopters. GE Aviation won against ATEC, a joint venture between Honeywell and Pratt & Whitney. GE Aviation's T901 turboshaft engine might also power helicopters of the U.S. Armed Forces' Future Vertical Lift (FVL) plan, for which GE Aviation is in competition with Honeywell International.
- ▶ GE Aviation was selected by the U.S. Navy to equip two new Arleigh Burke-class destroyers with LM2500 gas turbines. The company is also well positioned to equip 20 frigates of the U.S. Navy's FFG(X) programme with these turbines.

Export markets

- ▶ Nearly 60% of GE Aviation's revenue was generated from export sales in 2018, mostly in the market for civil engines, and mainly in Europe (23%) and Asia (19%).
- ▶ In the military segment, the LM2500 gas turbines have been very successful on the export markets. As of early 2019, the engines powered 646 ships of 35 navies worldwide.
- ▶ In February 2019, GE Aviation won a contract to provide gas turbine auxiliary equipment (gas turbine controllers, firefighting equipment, etc.) to support the LM2500 engines of seven new P17A stealth frigates from the Indian Navy.
- ▶ In November 2018, Egypt awarded GE Aviation a \$273.5m (€231.6m) contract to upgrade the F110-GE-100 engines of its F-16 fighter jet fleet.

Technology and Innovation

- ▶ The U.S. Army's Improved Turbine Engine Program (ITEP) and Adaptive Engine Transition Program (AETP) concentrate most of the company's military R&D expenditures.
- ▶ In July 2018, GE Aviation was awarded a \$437m (€387m) contract by the U.S. Air Force Cycle Management Center to continue development work on its adaptive cycle engines.



BUSINESS AREAS

Systems integrator/equipment supplier

- ▶ Radar systems
- ▶ Electronic warfare
- ▶ Optronics
- ▶ Communication and display systems
- ▶ UAS
- ▶ IFF (Identification Friend or Foe) systems

GOVERNANCE

Chairman and CEO
 Chief Financial Officer
 Chief Operating Officer

Thomas Müller
 Axel Salzmann
 Peter Schlote

OWNERSHIP STRUCTURE*

Symbol

Listed on

Market Cap

Unlisted group

Major shareholders (as of 20.11.2019)

KKR	74,90%
Hensoldt	25,10%

*The German State owns a so-called golden share in Hensoldt, providing it with a veto power on major decisions.

MAIN JOINT VENTURES AND ASSOCIATES*

Name	%	Country
Hensoldt Cyber GmbH	N/A	Germany

*Name of Hensoldt (49%) and Atlas Services (51%) joint venture unknown.

KEY FIGURES (Fiscal year ended: December 31st)*

€ millions	2015	2016	2017	2018
Revenue	-	~1 000	~1 100	~ 1 000
Δ (%)	-	-	-	-
Defence (%)	-	N/A	95% **	N/A
Export (%)	-	N/A	N/A	N/A
Operating profit/loss	-	N/A	N/A	N/A
Operating margin (%)	-	N/A	N/A	N/A
Net income	-	N/A	N/A	N/A
Order book	-	N/A	N/A	N/A
Employees	-	~4 000	~4 300	~ 4 500

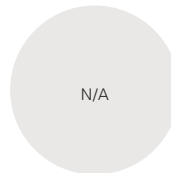
*Group results published from 2016.

**SIPRI estimation.

REVENUE BY BUSINESS LINE (%)



REVENUE BY REGION (%)



MAIN PROGRAMMES, COOPERATIONS AND EXPORT PARTNERSHIPS

	Airbus	Indra Sistemas	Leonardo	Thales	Lockheed Martin	Electronica	Safran	Robote & Schwarz	Diehl Defence	Mads	ESG
Radar systems											
AESA E-CAPTOR (Eurofighter)	●	●	●								
PreclSR and ASR air surveillance radars											
TRS 3D and 4D naval radars											
Counter Battery Radar (COBRA)	●			●	●						
IFF (Identification Friend or Foe) systems											
MSR 1000 I and MSSR 2000 I interrogators											
Defence electronics											
MILDS and MILDS-F missile warning systems											
Airborne Missile Protection Systems (AMPS)											
ALTAS laser warning system											
Multifunctional Self-protection System for vehicles (MUSS)											
Kalaetron Radar Warning Receiver (Kalaetron RWR)											
NGWS ¹ electronic warfare (FCAS programme)							●	●		●	
Optronics											
Euroflir 610 multispectral electro-optical targeting and observation system						●			●		
Communication and display systems											
MIDS Low Volume Terminals (MIDS-LVT)	●	●	●								
UAS											
ISTAR solution (European MALE RPAS)	●		●		●						

STRATEGIC HIGHLIGHTS

Business trends

- ▶ Hensoldt was established in February 2017 through the majority sale of Airbus's Defence Electronics unit to U.S. investment firm KKR for approximately €1.1bn. In September 2018, Hensoldt became a fully independent company after completing the buy-back of a remaining 25.1% capital share retained by Airbus after the split.
- ▶ Hensoldt ranked 77th among the world's defence companies in 2018, with annual revenues of around €1bn, almost all of which are generated in the defence sector.
- ▶ Hensoldt has made numerous acquisitions since its creation. After taking over the French branch of Airbus DS Electronics and Border Security, renamed Hensoldt France SAS, in August 2018, the company took control of most of the activities of Nexeya, a French supplier of electronic equipment and services. The activities acquired by Hensoldt together generate approximately €95m in revenue.
- ▶ In February 2019, Hensoldt and United Arab Emirates-based Atlas Group announced the creation of a joint venture in which they will hold 49% and 51% of the capital, respectively. The joint venture will provide Hensoldt the local presence necessary for the sale of sighting, detection and night vision equipment in the United Arab Emirates.

Home market

- ▶ A major supplier to the German Armed Forces, Hensoldt intends to strengthen its position in its domestic market, in particular by taking advantage of the opportunities provided by major military programmes planned by Germany for the coming years.
- ▶ In 2019, Hensoldt was chosen by the German Navy to equip 5 new K130 Braunschweig-class corvettes with the TRS-4D naval radar and the MSSR 2000 I surveillance radar. In partnership with Raytheon, the company also won two contracts to supply air surveillance radars to Germany and the Netherlands (3 and 1 units, respectively).
- ▶ The group is partnering with Elettronica, Indra and Thales to offer an ISTAR (Intelligence, Surveillance, Target Acquisition and Reconnaissance) solution as part of the European MALE RPAS UAV programme. In June 2019, Hensoldt also joined forces with Safran Electronics & Defense and Spain's Mades to develop the Euroflir 610, a high-performance multispectral electro-optical targeting and observation system proposed for the future European drone.
- ▶ At the same time, Hensoldt, Diehl Defence, ESG and Rohde & Schwarz joined forces to form the German FCMS (Future Combat Mission System) consortium to participate in the European NGWS programme (which is part of the Future Combat Air System, or FCAS) in the field of defence electronics.

Export markets

- ▶ In January 2019, Hensoldt won a contract worth more than €20m to upgrade the TRS-3D and MSSR 2000 I surveillance radars of the Norwegian Coast Guard's three Nordkapp-class patrol vessels, to be delivered from 2021. An option was included to carry out the same operation on other vessels.
- ▶ In March 2019, Hensoldt received a first order from Airbus Helicopters for 20 AMPS (Airborne Missile Protection System) to be delivered in 2019-2020. The order came as part of a 10-year AMPS supply contract signed with Airbus Helicopters in late 2018.
- ▶ The requirement for NATO member states to upgrade IFF (Identification Friend or Foe) systems also supports the activity of Hensoldt, one of Europe's leading players in this segment. In April 2019, Hensoldt was selected to supply 134 IFF Mode-5 interrogators to France's Ministry of the Armed Forces.

Technology and Innovation

- ▶ The group introduced several innovations in 2019: the IFF identification system for NESIS 4000 naval platforms; the SferiRec LCR flight data recorder; as well as the Kalaatron family of radar warning and signals intelligence (SIGINT) system.



BUSINESS AREAS

Platform manufacturer and systems integrator

- ▶ Fighter aircraft
- ▶ Helicopters
- ▶ Structures and components
- ▶ Avionics
- ▶ Engines

GOVERNANCE

Chairman and CEO
Chief Financial Officer

R. Madhavan
C.B. Ananthkrishnan

OWNERSHIP STRUCTURE (as of 20.11.2019)

Symbol	HAL
Listed on	NSE & BSE
Market Cap (Rs Cr.)	26 199

Major shareholders (as of 20.11.2019)

Indian State	90,00%
Life Insurance Corporation of India	7,00%
ICICI Prudential Asset Management Co. Ltd.	0,39%

MAIN JOINT VENTURES AND ASSOCIATES

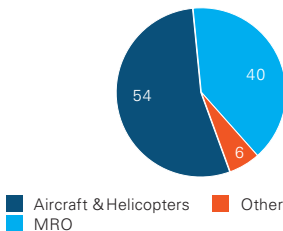
Name	%	Country
International Aerospace Manufacturing Pvt Ltd	50%	India
Safran HAL Aircraft Engines Pvt Ltd	50%	India
Indo-Russian Aviation Ltd	48%	India
HATSOFF Helicopter Training Pvt Ltd	50%	India
SAMTEL HAL Display Systems Ltd	40%	India
Indo-Russian Helicopters Ltd	50,5%	India

KEY FIGURES (Fiscal year ended: March 31st)

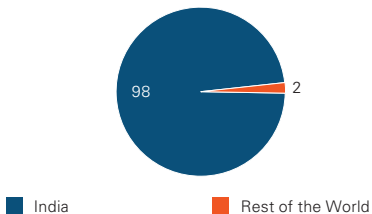
€ millions	2015-16	2016-17	2017-18	2018-19
Revenue	2 295	2 392	2 422	2 434
Δ (%) [Rs Cr.]*	6,18%	6,14%	3,86%	7,77%
Defence (%)	96%	97%	93%	94%
Export (%)	3%	3%	2%	2%
Operating profit/loss	444	487	429	448
Operating margin (%)	19,34%	20,35%	17,72%	18,41%
Net income	277	355	263	282
Order book	N/A	N/A	7 612	7 538
Employees	30 300	29 526	29 035	28 345

*1 crore equals 10 000 000 rupees.
Variation based on revenue in local currency.
See €/INR exchange rates p. 7.

REVENUE BY BUSINESS LINE (%)



REVENUE BY REGION (%)



MAIN PROGRAMMES, COOPERATIONS AND EXPORT PARTNERSHIPS

	Elbit Systems	Dassault Aviation	Thales	BAE Systems	RUAG	Boeing	Airbus	Safran	NPO Saturn	GE Aviation	Rolls-Royce	UAC
Military aircraft												
Advanced Medium Combat Aircraft (AMCA)												
LCA Tejas fighter aircraft	●	●							●			
Su-30 MKI fighter aircraft*	●	●						●			●	
Hawk-i* and Advanced Hawk* Jet Trainers			●						●			
Do-228 maritime patrol aircraft (under Dornier licence)				●								
Military helicopters												
Light Utility Helicopter (LUH) (under development)								●				
Light Combat Helicopter (LCH) twin-engine multi-role helicopter								●				
Dhruv and Rudra twin-engine multi-role helicopters								●				
Chetak and Cheetah multi-role helicopters*						●	●					
Modernisation projects												
Mirage 2000 fighter aircraft	●	●										
Jaguar DARIN III fighter aircraft												
Aerostructures												
Weapons bay doors (F/A-18E/F, P-8)					●							
Engines												
AL-31 FP turbojet engine (Su-30 MKI)*								●				
Adour Mk 811 (Jaguar) and Mk 871 (Hawk)* turbojet engines							●			●		
Ardiden 1H1 Shakti turboshaft engine (Dhruv, LCH)*							●					
Artouste III B turboshaft engine (Cheetah, Chetak)*							●					

*Built under licence

STRATEGIC HIGHLIGHTS

Business trends

- ▶ Hindustan Aeronautics Ltd (HAL) is an Indian platform manufacturer and systems integrator mainly active in aeronautics (fighter aircraft, helicopters, avionics systems, aerostructures, propulsion systems). The group almost exclusively operates in the defence sector. It mostly acquires its competencies from Russian and European suppliers through technology transfer agreements negotiated as part of Indian defence equipment procurement contracts ("Make In India" policy).
- ▶ The group's turnover increased by nearly 8% in 2018-2019, to 19,705 crores of rupees (€2.4bn). During the year, HAL produced 41 aircraft and helicopters and 102 engines, and maintained 213 aircraft and 560 engines.
- ▶ The group's order book stood at 58,588 crores of rupees (€7.5bn) as of March 31, 2019. It includes the delivery to the Indian Armed Forces of 52 fighter aircraft (40 Tejas and 12 Su-30 MKI), 11 Do-228 patrol and surveillance aircraft and 100 helicopters (72 Dhruv, 20 Cheetah and 8 Chetak).

Home market

- ▶ The group is strongly focused on its domestic market, which accounted for 98% of its sales during fiscal year 2018-2019.
- ▶ In April 2018, HAL and Mahindra entered into a partnership with Boeing to respond to a call for tenders from the Indian government for 114 multi-role fighter aircraft, a contract valued at \$18bn (€15.9bn). If their joint bid is successful, Boeing's F/A-18 E/F Super Hornet will be produced in India to meet local manufacturing criteria. This call for tenders pits Boeing against the main military aviation manufacturers, including Lockheed Martin, the Eurofighter consortium, Dassault Aviation, UAC and Saab AB.
- ▶ As part of the "Make in India" policy, HAL aims to increase the share of local manufacturing in its programmes and thus strengthen its national presence. HAL's local programmes include the multi-role Light Utility Helicopter and Light Combat Helicopter as well as the Hindustan Turboprop Trainer-40 (HTT-40) training aircraft.
- ▶ In 2019, HAL delivered the first Mirage 2000 jet fighter fully upgraded in India. The group also began delivering the Chetak rotorcraft and Advanced Light Helicopters ordered by the Indian Armed Forces in 2017.
- ▶ During fiscal year 2019-2020, HAL expects to sign contracts with the Indian Armed Forces for the supply of 83 Tejas MKIA fighter aircraft, 40 Sukhoi Su-30 MKI fighter aircraft, as well as 15 Light Combat Helicopters.

Export markets

- ▶ Export sales remain marginal and are partly based on space and civil aeronautics activities (sub-assemblies for the Boeing 737 and Airbus A320 in particular).
- ▶ To increase its international presence, HAL relies mainly on the Do-228 patrol and surveillance aircraft as well as the Dhruv and Cheetah/Chetak helicopters, which have been chosen by Afghanistan, Nepal, Namibia, Ecuador and Suriname.
- ▶ The group also plans to export its Tejas fighter aircraft as well as the Advanced Hawk, a fighter and training aircraft under development in partnership with BAE Systems.

Technology and Innovation

- ▶ The group's R&D expenditure amounted to 1,464 crores of rupees (€188m) in 2018-2019, representing 7.4% of sales. HAL has 11 R&D centres and is building partnerships with Indian Ministry of Defence research centres as well as higher education institutions.
- ▶ Together with the Indian Aeronautical Development Agency (ADA), HAL is co-developing the 5th-generation Advanced Combat Medium Aircraft (AMCA) fighter aircraft. The first prototype is expected in 2025.



BUSINESS AREAS

Engine manufacturer, systems integrator/equipment supplier

- ▶ Commercial and military aerospace (propulsion systems, avionics, electric power)
- ▶ Defence electronics and ISR systems
- ▶ Protection solutions
- ▶ Infrastructures, energy
- ▶ Equipment for automotive industry

GOVERNANCE

Chairman and CEO	Darius Adamczyk
CEO Honeywell Aerospace	Tim Mahoney
Chief Financial Officer	Greg Lewis

OWNERSHIP STRUCTURE (as of 20.11.2019)

Symbol	HON
Listed on	NYSE
Market Cap (\$m)	131 090

Major shareholders (as of 20.11.2019)

The Vanguard Group, Inc.	7,40%
SSgA Funds Management, Inc.	4,07%
Massachusetts Financial Services Co.	3,39%
Evercore Trust Company, NA	2,76%
BlackRock Fund Advisors	2,50%

MAIN JOINT VENTURES AND ASSOCIATES

Name	%	Country
ITEC LLC	50%	United States
ATEC LLC	50%	United States
LHTEC	50%	United States
Integrated Guidance Systems LLC	50%	United States
Honeywell TAECO Aerospace (Xiamen) Co. Ltd	65%	China

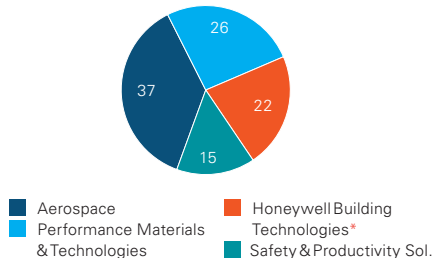
KEY FIGURES (Fiscal year ended: December 31st)

€ millions	2015	2016	2017	2018
Revenue	34 758	35 503	35 871	35 395
Δ (%)/[\$]*	-4,28%	1,87%	3,13%	3,13%
Defence (%)	12%	11%	10%	11%
Export (%)	38%	42%	44%	43%
Operating profit/loss	5 620	5 466	5 578	5 677
Operating margin (%)	16,17%	15,40%	15,55%	16,04%
Net income **	4 298	4 347	1 368	5 728
Order book	16 697	16 392	14 754	21 703
Employees	129 000	131 000	131 000	114 000

*Variation based on revenue in local currency. See €/\$ exchange rates p.7

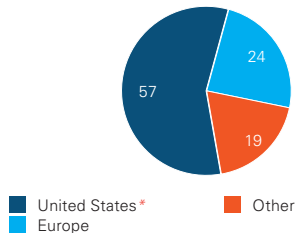
**Net income attributable to shareholders.

REVENUE BY BUSINESS LINE (%)



*Formerly Home and Building Technologies.

REVENUE BY REGION (%)*



*Including export sales.

MAIN PROGRAMMES, COOPERATIONS AND EXPORT PARTNERSHIPS

	Rolls-Royce	Lockheed Martin	AIDC	Pratt & Whitney*	PT Dirgantara Indonesia	KHI	HAL
Engines and Auxiliary Power Units (APUs)							
T55 turboshaft engine (CH-47, MH-47)					●		
HPW3000 turboshaft engine (via ATEC JV)			●				
TPE331 turboprop engine (MQ-9 Reaper, HTT-40, NC212i)				●		●	
AGT 1500 gas turbine (Abrams M1)							
CTS800 turboshaft engine (TLUH)	●						
F124/F125 turbofan engines (M346, L-159, T-100, F/A-259 Striker)			●				
36-150 series APUs (AH-64, UH-60, CH-47)							
G230 and G250 series APUs (F-35, F-22)							
Avionics							
Enhanced Ground Proximity Warning System (EGPWS)							
Embedded GPS/INS (EGI)							
Weather radar system							
RDR-4000M 3-D weather radar system							
Security and maintenance							
Health and Usage Monitoring System (HUMS)							
Ballistic protection							
Gold Shield body armor							
Control actuation system							
Missile steering actuation and electronic control system for GMLRS	●						
Satellite communications system							
JetWave satellite communications system							

*UTC group

STRATEGIC HIGHLIGHTS

Business trends

- ▶ Honeywell International is a diversified U.S.-based industrial conglomerate. Among its activities, the group develops and manufactures engines, systems and equipment, notably in the fields of commercial and military aeronautics and aerospace. The group in particular supplies propulsion systems and defence electronics. Honeywell's defence activities represented 11% of its revenue in 2018 (compared to 10% in 2017).
- ▶ In October 2018, Honeywell completed the spin-off of two businesses (Homes and Global Distribution, Transportation Systems) from its Home and Building Technologies and Aerospace divisions, respectively. Both businesses were divested as independently-listed companies. The first includes heating, ventilation, air conditioning and home security activities as well as the distribution of safety and fire protection equipment. The second, renamed Garrett-Advancing Motion, regroups Honeywell's former transport systems activities. The remaining assets mainly include Honeywell's activities in the aeronautics and space sectors.

Home market

- ▶ Honeywell generated 57% of its turnover in its domestic market in 2018. Sales to the U.S. Department of Defense amounted to \$2.83bn (€2.5bn), representing only 11.9% of the company's revenue generated in the United States in 2018.
- ▶ The group is involved in the main U.S. aeronautics and space programmes: engines, avionic systems, on-board electronics, auxiliary power units (APU), etc.
- ▶ Honeywell's activity is driven by multi-year equipment maintenance and modernisation contracts (e.g. modernisation of T-55 engines of the CH-47 Chinook for the U.S. Air Force).
- ▶ In May 2019, the U.S. Department of Defense selected Honeywell's JetWave satellite communication system to equip 70 C-17 Globemaster III transport aircraft as part of the Fixed Installation Satellite Antenna (FISA) programme. Deliveries are expected to end in 2021.

Export markets

- ▶ Honeywell generated 43% of its revenue in foreign markets in 2018. Europe, which accounted for 24% of the group's sales, remains its main international market.
- ▶ MRO missions support Honeywell's export activity. The group mainly relies on production licensing and partnerships, particularly in Asia.
- ▶ In 2018, Honeywell and Israel Aerospace Industries (IAI) signed a cooperation agreement to develop a new GPS anti-jam system. Under the agreement, IAI's GPS anti-jam system will be integrated with Honeywell's Embedded GPS/INS (EGI) system.
- ▶ After a successful first test in 2017, the Royal Australian Air Force in April 2019 announced the installation of the JetWave system on five additional C-130J Hercules transport aircraft.

Technology and Innovation

- ▶ Honeywell's R&D expenses amounted to \$1.81bn (€1.53bn), or 4.3% of sales in 2018, a slight decrease compared to the previous year (4.5%).
- ▶ Honeywell is developing a new version of the T55 turboshaft engine, a version designed to equip the U.S. Army's future military helicopters as part of the Future Vertical Lift programme. In 2019, the current version of the T55 was successfully tested on the Sikorsky-Boeing SB-1 DEFIANT demonstrator during a test flight.



BUSINESS AREAS

Platform manufacturer and systems integrator

- ▶ Aircraft carriers
- ▶ Submarines (SSN, SSBN)
- ▶ Surface ships
- ▶ Amphibious assault ships (LHA, LPD)
- ▶ C4ISR
- ▶ Logistic support
- ▶ Energy

GOVERNANCE

Chairman and CEO	Mike Petters
Chief Financial Officer	C. D. Kastner
President	J. Boykin
Newport News Shipbuilding	
President Ingalls Shipbuilding	B. Cuccias

OWNERSHIP STRUCTURE (as of 20.11.2019)

Symbol	HII
Listed on	NYSE
Market Cap (\$m)	10 667

Major shareholders (as of 20.11.2019)

The Vanguard Group, Inc.	11,20%
SSgA Funds Management, Inc.	8,16%
Fidelity Management & Research Co.	6,88%
Greenlight Capital, Inc.	5,18%
Eton Park Capital Management LP	4,35%

MAIN JOINT VENTURES AND ASSOCIATES

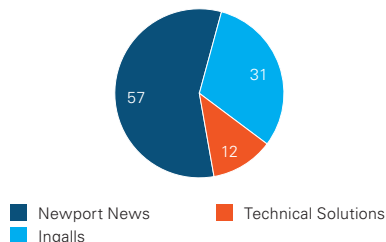
Name	%	Country
NSI Pty Ltd	N/A	Australia
Newport News Nuclear BWXT-Los Alamos (N3B Los Alamos)	N/A	United States

KEY FIGURES (Fiscal year ended: December 31st)

€ millions	2015	2016	2017	2018
Revenue	6 324	6 385	6 585	6 923
Δ (%)	0,91 %	0,68 %	5,28 %	9,88 %
Defence (%)	~95%	~95%	~95%	~95%
Export (%)	N/A	N/A	N/A	N/A
Operating profit/loss	697	791	780	805
Operating margin (%)	11,03%	12,39%	11,84%	11,63%
Net income	364	518	424	708
Order book	20 259	19 673	17 821	20 083
Employees	~36 000	~37 000	~38 000	~41 000

*Variation based on revenue in local currency.
See €/€ exchange rates p.7

REVENUE BY BUSINESS LINE (%)*



*Revenue distribution based on total sales excluding eliminations.

REVENUE BY REGION (%)



HUNTINGTON INGALLS INDUSTRIES (HII)

MAIN PROGRAMMES, COOPERATIONS AND EXPORT PARTNERSHIPS

	BAE Systems	Northrop Grumman	General Atomics	Bechtel Marine	General Propulsion Corporation	General Electric	Lockheed Martin	Raytheon
Aircraft carriers								
Ford-class aircraft carrier (CVN)	●	●	●	●				●
Nimitz-class aircraft carriers refueling and complex overhaul (CVN)		●		●				●
Submarines								
Virginia-class nuclear-powered attack submarine (SSN)	●					●	●	●
Columbia-class ballistic missile submarine (SSBN) (Ohio-class ballistic missile submarines replacement)	●					●	●	●
Surface ships								
Arleigh Burke-class destroyer (DDG 51)	●			●	●	●	●	●
Modernisation of Arleigh Burke-class destroyers (DDG 51)	●				●			
Legend-class National Security Cutter (NSC)				●				●
Amphibious assault ships								
America-class Landing Helicopter Assault (LHA)				●				●
San Antonio-class Landing Platform Dock (LPD)					●	●	●	
C4ISR								
C4ISR and NAVWAR (Naval Information Warfare Systems Command) programmes								
Logistic support								
Planning yard services in support of in-service Littoral Combat Ships (LCS)								

STRATEGIC HIGHLIGHTS

Business trends

- ▶ Huntington Ingalls Industries is the leading military shipbuilding company in the United States. It was created in 2011 through the spin-off of Northrop Grumman's naval activities. It is the only manufacturer of the U.S. Navy's Ford-class aircraft carriers and the co-manufacturer, alongside General Dynamics, of Arleigh Burke-class destroyers and Virginia-class nuclear-powered attack submarines.
- ▶ The group posted further growth in 2018 (+10%), with turnover reaching \$8.2bn (€7bn), supported by sales of amphibious vessels and aircraft carriers. Almost all of Huntington Ingalls Industries' revenues are generated in the U.S. defence market.
- ▶ With nearly \$10bn (€8.7bn) worth of new contracts won in 2018, the group's order book stood at \$23bn (€20.1bn) at the end of December 2018.
- ▶ Most of the group's activity is divided between the Newport News Shipbuilding shipyard (Ford-class aircraft carriers, Virginia-class submarines) and the Ingalls Shipbuilding shipyard (LHA and LPD amphibious vessels, Arleigh Burke-class destroyers). In 2016, Huntington Ingalls Industries created the Technical Solutions division (12% of total revenue in 2018), which comprises maintenance operations and nuclear activities.

Home market

- ▶ As a key player in the U.S. naval sector, Huntington Ingalls Industries is one of the main beneficiaries of U.S. Navy programmes.
- ▶ In January 2019, the group won a \$15.2bn (€13.6bn) contract from the U.S. Navy to build the 3rd and 4th Ford-class aircraft carriers. The two vessels are scheduled to be delivered in 2028 and 2032. The USS Gerald R. Ford, the first ship of the new class, was commissioned in July 2017 but will not be deployed by the US Navy before 2022 due to the complex final manufacturing stages of the ship, which incorporates several new technologies. Built at the Newport News shipyard in Virginia, the Ford-class aircraft carriers are the successors to the Nimitz-class carriers. They can carry 70 aircraft (including the future F-35C), helicopters and drones and for the first time are equipped with the new Electromagnetic Aircraft Launch System (EMALS).
- ▶ The group is also involved in the construction of Arleigh Burke-class destroyers, alternating with Bath Iron Works (a subsidiary of General Dynamics). In September 2018, the U.S. Navy awarded a \$5.1bn (€4.3bn) contract to Huntington Ingalls Industries for the construction of 6 new ships.
- ▶ In 2019, Huntington Ingalls Industries also won a \$1.47bn (€1.31bn) U.S. Navy contract to build the 14th San Antonio-class amphibious transport ship, the LPD 30.
- ▶ The U.S. shipbuilder is also in competition with Bath Iron Works, Austal and Fincantieri for the U.S. Navy's FFG(X) future multi-mission frigate programme. Huntington Ingalls Industries' offer is based on the Legend-class cutter of the U.S. Coast Guard. The U.S. Navy's decision is expected in 2020.
- ▶ In the submarine segment, Huntington Ingalls Industries is the U.S. leader in nuclear-powered attack submarines alongside General Dynamics. The two groups alternate in the production of Virginia-class nuclear-powered attack submarines (SSN). In 2016, General Dynamics was chosen as prime contractor for the development of the new Columbia-class ballistic missile submarine (SSBN). Its subsidiary Electric Boat will carry out the majority of production and final assembly of the submarines, with Huntington Ingalls Industries acting as the main subcontractor. The construction of 12 Columbia-class SSBNs is planned between 2021 and 2039.

Technology and Innovation

- ▶ The group's self-financed R&D expenses amounted to \$25m (€22m) in 2018. Most of the R&D costs of its programmes are financed by government contracts.



BUSINESS AREAS

Systems integrator/equipment supplier

- ▶ Defence and security (air defence, radar, UAS, surveillance systems, C4I)
- ▶ Transportation
- ▶ Energy and Industry
- ▶ Financial services
- ▶ Public and Health sectors
- ▶ Telecom and Media

GOVERNANCE

Chairman and CEO	F. Abril-Martorell
Chief Financial Officer	J. Lázaro
Head of Defense & Security	M. Escalante

OWNERSHIP STRUCTURE (as of 20.11.2019)

Symbol	IDR
Listed on	Bolsa de Madrid
Market Cap (€m)	1 669

Major shareholders (as of 20.11.2019)

SEPI (Spanish State)	18,70%
Corporación Financiera Alba, S.A.	10,50%
Fidelity Management & Research Co.	9,16%
Norges Bank Investment Management	3,56%
FIL Investment Advisors (UK) Ltd.	3,51%

MAIN JOINT VENTURES AND ASSOCIATES

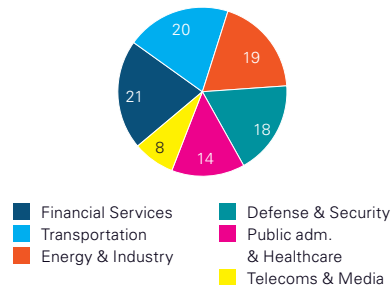
Name	%	Country
Inmize Sistemas S.L.	40%	Spain
Euromids SAS	25%	France
UTE Indra-Eurocopter	62,5%	Spain
SAES Capital SA	49%	Spain
Eurofighter Simulation System GmbH	26%	Germany
UTE Indra-EADS CASA	50%	Spain
UTE VCR 8x8	37,94%	Spain

KEY FIGURES (Fiscal year ended: December 31st)

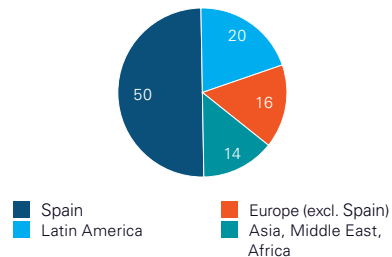
€ millions	2015	2016	2017	2018
Revenue	2 850	2 709	3 011	3 104
Δ (%)	-2,98%	-4,95%	11,14%	3,08%
Defence (%)	19%	22%	20%	18%
Export (%)	57%	57%	54%	50%
Operating profit/loss	-641	162	196	199
Operating margin (%)	-22,50%	5,96%	6,50%	6,42%
Net income*	-641	70	127	120
Order book	3 193	3 129	3 612	4 065
Employees	37 060	34 294	40 020	43 707

*Net income attributable to shareholders.

REVENUE BY BUSINESS LINE (%)



REVENUE BY REGION (%)



MAIN PROGRAMMES, COOPERATIONS AND EXPORT PARTNERSHIPS

	Thales	Hensoldt	Airbus	Boeing	Electronica	BAE Systems	Leonardo	Santa Bárbara Sistemas*	Lockheed Martin	Navantia
Defence electronics										
NGWS future fighter aircraft (defence electronics)	●	●								
InSHIELD DIRCM countermeasure system (A400M)			●	●						
EuroDIRQM IR countermeasure system					●					
RF ALQ-500 countermeasure system (Spanish F/A-18)										
Praetorian Defensive Aids Sub-System (DASS) (Eurofighter)		●			●	●	●			
RIGEL electronic defence system										
C2 systems										
8x8 DRAGON VCR future wheeled armoured vehicles mission system							●			
Lince Battlefield Management System (BMS)	●									
UAS and air collision avoidance system										
European MALE RPAS (ISTAR solution)	●	●			●					
Simulation solutions										
ASTA fighter aircraft simulator (Eurofighter)										
Military transport aircraft simulators (A400M, C130)			●							
Military helicopters simulators (Tigre, NH90, AW159, Chinook, etc.)			●	●		●				
Radars and sonars										
Naval suite for submarines (209/212/214, S-80)										●
3D Lanza radar family										
E-CAPTOR AESA radar		●								
S-band AESA naval radars (F-100/F-110)								●	●	

*General Dynamics subsidiary

STRATEGIC HIGHLIGHTS

Business trends

- ▶ Indra Sistemas is a Spanish supplier of equipment and systems in various civil and military sectors including defence, transportation, energy, industry, and financial services. The group generated 18.9% of its revenue in the defence sector in 2018. In the military sector, its activities include defence electronics solutions, radars, surveillance systems, training solutions, flight simulators, and UAV systems.
- ▶ The group's turnover reached a record €3.1bn in 2018. After fiscal year 2017 was marked by the acquisition of Spanish IT company Tecnomcom, Indra Sistemas' growth however slowed down (+3.1% in 2018 compared to +11.1% in 2017). The Defence and Security business line, which is part of the Transport and Defence division, recorded a further decline in sales (-4.2%, after -0.5% in 2017), mainly due to the decline in activity on the Eurofighter programme, in which Indra Sistemas is involved as a contractor.
- ▶ At the end of 2018, Indra Sistemas inaugurated its new Madrid-based helicopter flight simulation centre (Centro de Simulación de Helicópteros, CESIHEL) developed in partnership with the Spanish Army. The centre is intended to accommodate both the Spanish and foreign armed forces, and will eventually have 10 simulators for different helicopter types (CH-47D Chinook, AS532 Cougar, EC135 and EC665, NH90, etc.).

Home market

- ▶ Indra Sistemas generated 50% of its turnover in Spain in 2018, a share that has been growing for several years (+7 percentage points since 2015). The group is involved in many of the Spanish Army's orders and programmes, in particular as a subcontractor of Navantia and General Dynamics European Land Systems (and the latter's subsidiary Santa Bárbara Sistemas).
- ▶ In June 2018, Indra Sistemas made a first demonstration of the mission systems intended to equip the future 8X8 VCR DRAGON wheeled armoured vehicles produced by Santa Bárbara Sistemas (GDELS). As part of this programme of the Spanish Ministry of Defence, both partners are working alongside Sapa, a Spanish defence contractor.
- ▶ In early 2019, the Spanish procurement agency (DGAM) chose Indra Sistemas to participate in the Soprene project, which aims to use new technologies in the military field. The group is in particular in charge of a study on the use of artificial intelligence to facilitate predictive maintenance of Spanish Navy vessels.
- ▶ In February 2019, Spain officially joined the programme of the future European fighter aircraft (NGWS). Indra Sistemas will be responsible, alongside Thales and Hensoldt, for defence electronics.

Export markets

- ▶ The group's export activity fell by 4.7% in 2018, to €1.5bn (compared with €1.8bn in 2014). International sales are nevertheless expected to recover in 2020, supported by rising military spending and border surveillance needs in many countries.
- ▶ In December 2018, the group signed a contract of an undisclosed amount with Atlas Elektronik (TKMS, ThyssenKrupp group) to equip the five new K130 Braunschweig-class corvettes of the German Navy with the RIGEL electronic defence system. The K130 corvettes are produced by the ARGE K130 consortium composed of TKMS, Lürssen Defence and German Naval Yards Kiel.
- ▶ In May 2019, Indra Sistemas was selected by the UK's Royal Air Force to supply the Long Tactical Range 25 (LTR-25) military radar. The latest radar of the Lanza family, it has a long-range detection and rapid deployment capability. Delivery is scheduled for the end of 2019.

Technology and Innovation

- ▶ The group's R&D expenditure amounted to €210m in 2018, up 4.1% year-on-year. The R&D ratio reached 6.8%, close to its average level over the 2009-2014 period.



ISRAEL AEROSPACE INDUSTRIES (IAI)

BUSINESS AREAS

Platform manufacturer and systems integrator

- ▶ Electronic warfare
- ▶ Commercial and military aircraft
- ▶ Unmanned aircraft systems (UAS)
- ▶ Missile systems and air defence systems
- ▶ Naval systems and platform
- ▶ Cyber defence
- ▶ Observation satellites

GOVERNANCE

Chairman	Harel Locker
Chief Executive Officer	Nimrod Sheffer
VP Elta Systems	Yoav Turgeman

OWNERSHIP STRUCTURE

Symbol	ARSPB1
Listed on	TASE
Market Cap	Unlisted group

Major shareholders (as of 20.11.2019)

Israeli State	100%
---------------	------

MAIN JOINT VENTURES AND ASSOCIATES

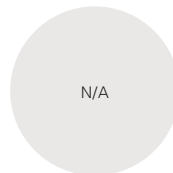
Name	%	Country
EAE Aerospace Solutions	50%	Brazil
D.T.S. Ltda.	50%	Chile
Tiltan Systems Engineering	30%	Israel
Pioneer UAV Inc.	50%	United States
HELA Systems Pvt Ltd	26%	India

KEY FIGURES (Fiscal year ended: December 31st)

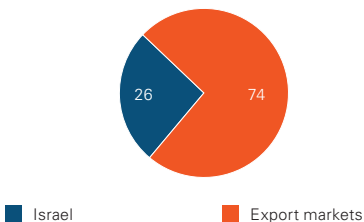
€ millions	2015	2016	2017	2018
Revenue	3 341	3 231	3 115	3 118
Δ (%) / (\$) *	-3,11%	-3,53%	-1,59%	4,60%
Defence (%)	75%	73%	70%	72%
Export (%)	78%	77%	76%	74%
Operating profit/loss	42	63	107	10
Operating margin (%)	1,27%	1,96%	3,44%	0,33%
Net income	8	20	72	-37
Order book	7 805	8 539	9 341	11 790
Employees	15 734	15 359	14 857	~15 000

* Variation based on revenue in US dollars.
See €/€ exchange rates p.7

REVENUE BY BUSINESS LINE (%)



REVENUE BY REGION (%)



ISRAEL AEROSPACE INDUSTRIES (IAI)

MAIN PROGRAMMES, COOPERATIONS AND EXPORT PARTNERSHIPS

	Airbus	Rheinmetall Defence	Boeing	DRDO*	Aero Vodochody	IMI Systems**	L3 MAS***	Honeywell International	Embraer	Indra Sistemas	Rafael
Electronic warfare											
ELL-8212, ELL-8222, ELL-8265, ELL-8260 and ELL-8270 systems for aircraft protection											
Military aircraft											
P600 Airbone Early Warning (AEW) aircraft (radar, electronic systems, etc.)								●			
F/A-259 Striker multi-role fighter aircraft				●							
ELM-2032 multimode airborne fire control radar											
GPS Anti-Jam Navigation System							●				
Unmanned aircraft systems											
Heron TP (Eitan) MALE UAS	●	●				●				●	
Bird-Eye tactical UAS (400/650/650D)											
Searcher Mk III tactical UAS										●	
Loitering munitions systems (Green Dragon/Harop/Harpy/Rotem)											
Missile systems and air defence systems											
Arrow (1/2/3) anti tactical ballistic missiles			●								
LRSAM/MRSAM (Barak 8) defence system				●						●	
Rampage air-to-ground missile					●						
ELM-2084-MMR radar		●									
Sky Capture command and control systems for land-based air defence											
Naval platform and systems											
SuperDvora MK3 patrol boat											
ELM-2248 and ELM-2258 multi-mission radars											

*Defence Research and Development Organization (India) **Elbit Systems group ***L3Harris Technologies group

STRATEGIC HIGHLIGHTS

Business trends

- ▶ Israel Aerospace Industries (IAI) is an entirely public company and one of Israel's leading defence firms. The group generated a turnover of \$3.7bn (€3.1bn) in 2018, up 4.6% in US dollar terms. Growth was mainly driven by the Systems, Missiles & Space and Aviation Group divisions.
- ▶ At the end of 2017, IAI announced a reorganisation of its activities into four divisions (compared with six previously), effective January 1, 2019: Elta Systems (defence electronics), Aviation Group (civil and military aeronautics), Military Aircraft (UAVs) and Systems, Missiles & Space.
- ▶ IAI's defence business grew over the year, driven by the Systems, Missiles & Space division. The share of defence activities in total turnover increased from 70% to 72% during 2018.

Home market

- ▶ IAI generated 26% of its revenue in its domestic market in 2018 (+4 percentage points compared to 2015).
- ▶ The Israeli Air Force announced its intention to strengthen its fleet of Heron TP UAVs, which are developed and produced by IAI. The missions carried out by these drones include intelligence gathering, surveillance and target identification.
- ▶ In August 2018, the Israeli Navy selected IAI's Barak 8 defence system to equip its future Sa'ar-6-class corvettes. The system will in particular enable Israel to monitor and defend its exclusive economic zone (EEZ) and its marine and coastal facilities.

Export markets

- ▶ The group generates about three quarters of its turnover from exports (74% in 2018). It has a strong presence in Asia, benefitting in particular from good diplomatic relations between Israel and India, and is increasingly targeting Africa and South America.
- ▶ In June 2018, IAI entered into a partnership with Airbus DS Airborne Solutions (a German subsidiary of Airbus) to lease 5 MALE Heron TP UAVs and 4 ground control stations to the Bundeswehr for a period of 9 years. Worth \$600m (€508m) for IAI, the agreement provides for Airbus DS Airborne Solutions to be responsible for operational support and maintenance of the drones.
- ▶ In October 2018, the group signed a \$777m (€679m) contract with the Indian Navy to supply the Barak 8 defence system for 7 of its vessels. The deal follows a previous \$630m (€558m) contract signed in 2017 for the same equipment. In 2019, two new contracts for a total value of \$143m (€130m) were signed with the Indian Navy for the supply of Medium Range Surface-to-Air Missile (MRSAM) naval systems.
- ▶ In October 2018, IAI won a \$550m (€466m) contract with an undisclosed customer from an Asian country (believed to be India's ground forces) to supply its Sky Capture system (3D tracking radar, 3D search radar and navigation system).
- ▶ In 2019, IAI joined forces with Lockheed Martin to offer a radar solution to the U.S. Army as part of the Lower Tier Air and Missile Defense Sensor (LTAMDS) programme. The group also entered partnerships with Embraer to offer the P600 AEW, a surveillance aircraft based on Embraer's Praetor 600 business jet, as well as with Honeywell to develop a new GPS anti-jamming system. IAI is also partnering with the Czech Republic's Aero Vodochy to develop the new F/A 259 Striker tactical support and observation aircraft.

Technology and Innovation

- ▶ At the 2018 Eurostat, IAI and IMI Systems (formerly Israel Military Industries, an Israeli weapons manufacturer recently acquired by Elbit Systems) unveiled Rampage, a new air-to-ground precision missile that can hit targets more than 150 km away. The missile is intended for the Israeli Army and went into production in early 2019.



IVECO DEFENCE VEHICLES

BUSINESS AREAS

Platform manufacturer and systems integrator
 Defence subsidiary of CNH Industrial N.V.

- ▶ Military vehicles (light multi-role vehicles, armoured and amphibious vehicles, main battle tank)
- ▶ Civil security vehicles

GOVERNANCE

Director IVECO Brand
 President and CEO
 Iveco Defence Vehicles

Gerrit Marx
 Vincenzo Giannelli

KEY FIGURES (Fiscal year ended: December 31st)

€ millions	2015	2016	2017	2018
Revenue	235	343	337	N/A
Δ (%)	-	46,08%	-1,63%	-
Defence (%)	100%	100%	100%	N/A
Export (%)	N/A	N/A	N/A	N/A
Operating profit/loss	9	12	1	N/A
Operating margin (%)	3,77%	3,37%	0,33%	N/A
Net income	-3	-3	-7	N/A
Order book	N/A	N/A	N/A	N/A
Employees	N/A	N/A	N/A	N/A

OWNERSHIP STRUCTURE

Symbol

Listed on

Market Cap

Unlisted subsidiary

Major shareholders (as of 20.11.2019)

CNH Industrial

100%

REVENUE BY BUSINESS LINES (%)



MAIN JOINT VENTURES AND ASSOCIATES

Name

%

Country

Consorzio Iveco
 Oto-Melara

50%

Italy

REVENUE BY REGION (%)



MAIN PROGRAMMES, COOPERATIONS AND EXPORT PARTNERSHIPS

	Leonardo	BAE Systems	KMW*	Lohr - Soframe	Cristanini	FPT Industrial**
Main battle tank						
Ariete main battle tank	●					
Armoured and multi-role vehicles						
Centauro II and Freccia armoured vehicles	●					
8x8 Superav amphibious armoured vehicle		●				
6X6 VBTP amphibious armoured vehicle						●
4x4/6x6 PUMA light armoured vehicles	●					
4x4 MPV Medium Protected Vehicle			●			
4x4 VTM multi-role tactical vehicle			●			
Tactical and logistic wheeled vehicles						
8x8 PPT tactical vehicle				●		
MUV Military Utility Vehicle and M40.15 WM Torpedo light range						●
8x8 M1250.70T WM tactical vehicle						●
TRAKKER and MLL logistic vehicles						
Light multi-role vehicles						
LMV Light Multi-role Vehicle		●			●	
LMV 2 Light Multi-role Vehicle						

*KNSD group

**CNH Industrial group

STRATEGIC HIGHLIGHTS

Business trends

- ▶ Iveco Defence Vehicles is the military vehicles subsidiary of Italian industrial vehicle manufacturing company Iveco, itself a division of the Dutch-based conglomerate CNH Industrial (CNHI) that was created by the 2013 merger between Fiat Industrial and its U.S. subsidiary CNH Global. In addition to its defence business, CNH Industrial is involved in the manufacture of agricultural and construction machinery.
- ▶ Iveco Defence Vehicles generated approximately €340m in revenue in 2018, less than 2% of CNH Industrial's total turnover.
- ▶ In early 2019, CNH Industrial reorganised its activities into 5 branches: Agriculture, Commercial and Specialty Vehicles (which includes Iveco Defence Vehicles), Construction, Powertrain and Financial Services. Following the reorganisation, Gerrit Marx was appointed President of the Commercial and Specialty Vehicles branch in place of Pierre Lahute.
- ▶ A few months later, the conglomerate announced it would split in two independent entities, spinning off its commercial vehicle brands and powertrain business into a separate company which will be publicly listed, while the remaining company will retain its agricultural, construction and special vehicles activities (including Iveco Defence Vehicles). The restructuring is part of the "Transform 2 Win" plan, which aims to reduce operating costs and increase the efficiency of the group's asset base. The separation is expected to be completed by the end of 2022.

Home market

- ▶ Iveco Defence Vehicles is a major supplier of land vehicles to the Italian Army, in particular through the Iveco-Oto Melara Consortium (CIO) which it established in 1985 with Leonardo on equal participation of 50%. Through CIO, Iveco Defence Vehicles participates in the production of 136 Centauro II wheeled armoured vehicles for the Italian Army (€159m contract signed in July 2018, of which €65m relating to Iveco Defence Vehicles).
- ▶ In late 2018, Iveco Defence Vehicles delivered a first batch of 34 Lynx 2 Light Multi-role Vehicles (LMV) to the Italian Army. The contract provides for the delivery of 400 units.

Export markets

- ▶ Iveco Defence Vehicles is one of the main beneficiaries of the Brazilian Army's infantry vehicle fleet renewal programme. The company is particularly benefitting from the Guarani programme launched in 2007, which aims to replace the Urutu armoured personnel carriers (APC) and Cascavel armoured cars. In 2013, Iveco Defence Vehicles inaugurated the Sete Lagoas industrial site in Brazil, where the future vehicles of the programme will be produced. In 2019, the group delivered the 400th amphibious APC to the Brazilian Army (€2bn contract won in 2009).
- ▶ As a partner of BAE Systems in the Amphibious Combat Vehicle (ACV) programme, Iveco Defence Vehicles is involved in providing amphibious assault vehicles to the United States Marine Corps. The vehicles are produced at several industrial sites in the United States.
- ▶ Iveco Defence Vehicles also supplies Trakker trucks to the German and Swiss Armed Forces as well as light armoured vehicles to the Norwegian Army.
- ▶ In September 2019, Iveco Defence Vehicles won a new contract from the Danish Ministry of Defence to deliver 1,275 medium multi-role protected vehicles from 2022 through 2026.

Technology and Innovation

- ▶ At Eurosatory 2018, Iveco Defence Vehicles unveiled its innovations for multi-role vehicles as well as tactical and logistics vehicles. Among the models on display were a lightweight 4x4 multi-role vehicle, the new Military Utility Vehicle (MUV), the High Mobility 8x8 as well as the Eurocargo 4x4 and Trakker 8x8 trucks.



BUSINESS AREAS

Platform manufacturer and systems integrator

- ▶ Commercial and military aircraft and helicopters
- ▶ Naval shipbuilding
- ▶ Railway construction
- ▶ Energy
- ▶ Offshore
- ▶ Space
- ▶ Precision machinery

GOVERNANCE

Chairman

Shigeru Murayama

Chief Executive Officer

Yoshinori Kanehana

KEY FIGURES (Fiscal year ended: March 31**)

€ millions	2015-16	2016-17	2017-18	2018-19
Revenue	11 624	12 787	12 130	12 420
Δ (%) / JPY*	3,70%	-1,44%	3,65%	1,30%
Defence (%)	N/A	N/A	N/A	N/A
Export (%)	59%	57%	58%	57%
Operating profit/loss	724	387	431	499
Operating margin (%)	6,23%	3,03%	3,55%	4,01%
Net income **	347	221	223	214
Order book	13 242	11 281	12 261	12 743
Employees	35 471	34 605	35 127	35 805

*Variation based on revenue in local currency.
See €/JPY exchange rates p.7.

**Net income attributable to shareholders.

OWNERSHIP STRUCTURE (as of 20.11.2019)

Symbol	7012
Listed on	JPX
Market Cap (MJPY)	430 000

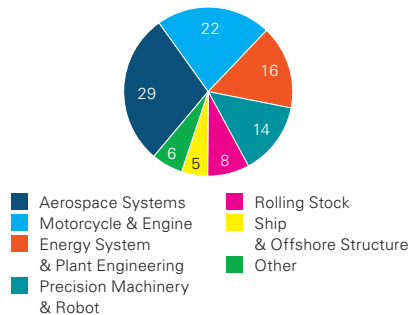
Major shareholders (as of 20.11.2019)

Capital Research & Management Co. (World Investors)	3,90%
Nomura Asset Management Co., Ltd.	3,76%
Nippon Life Insurance Co.	3,44%
DWS Investments (UK) Ltd.	2,64%
Mizuho Financial Group, Inc.	2,50%

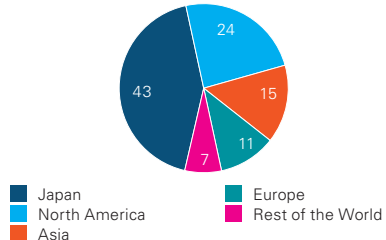
MAIN JOINT VENTURES AND ASSOCIATES

Name	%	Country
Enseada Indústria Naval S.A.	31,09%	Brazil

REVENUE BY BUSINESS LINE (%)



REVENUE BY REGION (%)



KAWASAKI HEAVY INDUSTRIES (KHI)

MAIN PROGRAMMES, COOPERATIONS AND EXPORT PARTNERSHIPS

	IHI Corporation	Mitsubishi Heavy Industries	Fuji Heavy Industries	Lockheed Martin	Northrop Grumman	Toshiba Corporation	Kokkums***	Honeywell International	Boeing	Leonardo
Military aircraft										
P-1 maritime patrol aircraft	●									
C-2 transport aircraft										
T-4 intermediate trainer	●									
F-2A/B fighters (based on Lockheed Martin's F-16 aircraft)*		●	●	●						
Maintenance for E-2C Hawkeye airborne early warning and control aircraft					●	●				
Maintenance for C-130H transport aircraft				●						
Maintenance for KC-767 tanker transport aircraft									●	
Military helicopters										
MCH-101 transport helicopter**										●
OH-1 light observation helicopter		●	●							
CH-47 JA transport helicopter**									●	
Submarine										
Soryu-class submarine		●					●			
Propulsion system										
T55 turbofan engine (CH-47 JA)**									●	

*Co-production

**Built under licence

***Saab AB group

STRATEGIC HIGHLIGHTS

Business trends

- ▶ Kawasaki Heavy Industries (KHI) is a Japanese conglomerate of more than 50 companies operating in various sectors such as heavy equipment, shipbuilding, aerospace (including commercial aircraft built in partnership with Boeing and Embraer), and defence, among others.
- ▶ Most of KHI's defence activities are concentrated within its Aerospace Systems (military aircraft and helicopters) and Ship & Offshore Structure (submarines) divisions.
- ▶ The group's revenue increased for the second consecutive year in 2018-2019 (+1.3%), reaching JPY 1,595bn (€12.4bn). Growth was mainly driven by the Precision Machinery & Robot and Motorcycle & Engine divisions (+23% and +25% growth in local currency, respectively). The Aerospace Systems division, the group's largest division by sales, posted a decline in sales (-5.5%), partly due to lower orders from the Japanese Ministry of Defense.

Home market

- ▶ KHI is a key supplier to the Japanese Armed Forces. The group is in particular the prime contractor for the long-range cargo aircraft (C-2) and maritime patrol aircraft (P-1) programmes and participates, alongside Mitsubishi Heavy Industries (MHI), in the co-production of Soryu-class submarines.
- ▶ The year 2019 saw the delivery of the 10th Soryu-class submarine (named Shoryu) to the Japanese Maritime Self-Defense Force (JMSDF). It is the 5th submarine of the Soryu-class manufactured by KHI in alternation with MHI. The 11th unit (named Oryu and built by MHI) will be the first to be equipped with lithium-ion batteries.
- ▶ In the field of military aeronautics, KHI is set to receive new orders from the Japan Air Self-Defense Force (JASDF), which has acquired some 30 C-2 long-range cargo aircraft, of which only 8 units have already been delivered. The group could also be commissioned to build new P-1 maritime patrol aircraft to replace Lockheed Martin's P-3Cs. JMSDF currently operates 15 P-1 maritime patrol aircraft delivered by KHI.
- ▶ In the military helicopter segment, KHI has been producing CH-47 JJA transport helicopters for the Japan Ground Self-Defense Force (JGSDF) and JASDF under licence from Boeing since 1984. In 1992, KHI became prime contractor for the first helicopter entirely designed in Japan, the OH-1 observation helicopter. JGSDF will acquire 38 such helicopters.
- ▶ The group is also in charge of the maintenance of JASDF military aircraft (including E-2C Hawkeye airborne early warning and control aircraft, C-130H transport aircraft, KC-767 tanker transport aircraft).

Export markets

- ▶ In 2014, Japan modified its regulation to lift a ban on arms exports. In this context, KHI intends to win new customers by offering the P-1 maritime patrol aircraft and the C-2 transport aircraft to foreign armed forces.
- ▶ The group in particular intends to propose the P-1 for the French-German project to develop a future maritime patrol aircraft (Maritime Airborne Weapon System, or MAWS), which is intended to replace the French Navy's ATL 2 as well as the German Navy's P-3 C Orion maritime patrol aircraft.
- ▶ KHI also proposed the C-2 transport aircraft to New Zealand as part of the country's Future Air Mobility Capability (FAMC) programme, which is to replace its Lockheed Martin C-130Hs and Boeing B757-200Cs. The group is furthermore said to be in discussions with the United Arab Emirates.

Technology and Innovation

- ▶ The Group's R&D expenses amounted to JPY 48.7bn (€380m) in 2018-2019, a 7% year-on-year increase in local currency. The R&D ratio reached 3.1%.



BUSINESS AREAS

Systems architect-integrator

- ▶ Main battle tanks, armoured vehicles, infantry fighting vehicles
- ▶ Weapon systems and artillery systems
- ▶ Ammunition
- ▶ Defence and security robotics
- ▶ Electronic equipment
- ▶ Simulation and training solutions

GOVERNANCE

Chairman of the Supervisory Board

Christian Jourquin

Co-President of the Directorate

Frank Haun

Co-President of the Directorate

Stéphane Mayer

OWNERSHIP STRUCTURE

Symbol

Listed on

Unlisted group

Market Cap

Major shareholders (as of 20.11.2019)

Wegmann & Co. GmbH	50%
Giat Industries S.A.	50%

MAIN JOINT VENTURES AND ASSOCIATES

Name % Country

NEXTER

CTA International	50%	France
TNS-MARS	37,5%	France

KMW

Projekt System & Management GmbH	50%	Germany
ARTEC GmbH	36%	Germany

KEY FIGURES (Fiscal year ended: December 31st)*

€ millions	2015	2016	2017	2018
Revenue	-	2 624	2 648	2 200
Δ (%)	-	-	0,91%	-16,92%
Defence (%)	-	100%	100%	100%
Export (%)	-	N/A	N/A	N/A
Operating profit/loss	-	277	303	N/A
Operating margin (%)	-	10,55%	11,43%	N/A
Net income	-	190	211	N/A
Order book	-	8 600	6 500	7 800
Employees	-	6 800	7 329	7 745

*New entity combining KMW and Nexter Defense Systems officially formed in December 2015.

REVENUE BY BUSINESS LINE (%)



REVENUE BY REGION (%)



KMW + NEXTER DEFENSE SYSTEMS (KNDS)

MAIN PROGRAMMES, COOPERATIONS AND EXPORT PARTNERSHIPS

	Thales	Safran	Arquus	BAE Systems	Rheinmetall Defence	Diehl Defence	Texelis	Iveco-Oto Melara*	Tatra	MAN
Armoured vehicles										
					●					
					●					
■ NEXTER	●		●							
■ KMW	●	●								
■	●	●								
■						●				
■								●		
■				●						
■				●						●
Weapon systems and artillery systems										
■		●						●		
■			●							
■				●			●			
■										
Ammunition										
■			●							
■										
■										
■	●	●				●				

*Joint venture between Iveco Defence Vehicles and Leonardo **Rights reserved

***Partnership between Jungheans T2M (a joint venture between Thales and Diehl Defence), Nexter Munitions and Zodiac Aerospace (Safran)

STRATEGIC HIGHLIGHTS

Business trends

- ▶ KNDS was formed by the July 2015 merger between Germany's KMW and France's Nexter manufacturers. A key supplier to France and Germany in the land segment and a major European player in the fields of wheeled and tracked armoured vehicles, artillery systems and ammunition, the group generated €2.2bn in revenue in 2018 (compared with €2.6bn in 2017).
- ▶ Although Nexter and KMW are each still largely focused on their respective programmes launched before the merger, KNDS is now developing joint programmes, such as the French-German MGCS (Main Ground Combat System, a future heavy combat tank) programme, in which Rheinmetall Defence is a partner; the CIFS (Common Indirect Fire System, a future artillery system) programme; and the development of the Euro Main Battle Tank (EMBT), an export-oriented battle tank combining the respective expertise of the two manufacturers.
- ▶ In November 2018, Rheinmetall Defence announced its interest in acquiring Krauss-Maffei Wegmann GmbH & Co., the sole shareholder of KMW (which makes up 50% of KNDS). To succeed, the transaction would require the consent of the French government, which owns the 50% share in KNDS through state-owned Nexter and is keen to maintain a balance between the French and the German part of KNDS.

Home markets (France, Germany)

- ▶ Along with Arquus, Texelis and Thales, Nexter participates in the French Army's Scorpion programme for the development and delivery of three new armoured vehicles with interconnected combat systems to enable collaborative combat: the Jaguar, Griffon and Serval. 300 EBRC Jaguar, 1,872 VBMR Griffon and 978 VBMR light Serval vehicles are to be delivered by 2030, half of which by 2025.
- ▶ In July 2019, Nexter announced it will invest €60m over three years in its Roanne site (central France) to support the ramp-up in production of land combat platforms (from 170 vehicles per year in 2019 to 450 in 2022), particularly for vehicles of the Scorpion programme.
- ▶ Germany awarded KMW a €300m contract to upgrade 101 Leopard 2A6 tanks to the 2A7V variant (modernisation of targeting system, firing control system, chassis, etc.) by 2026.

Export markets

- ▶ In June 2019, the French defence procurement agency (DGA) awarded Nexter a contract to supply 60 Jaguar EBRCs and 382 Griffon VBMRs to the Belgian Army from 2025 onwards, as part of an agreement between France and Belgium for the Belgian CaMo (Motorised Capacity) programme. Nexter will receive €1.1bn for this contract and €500m will go to Belgian defence companies, including John Cockerill (formerly CMI Defence) and FN Herstal, which will participate in the production of the vehicles.
- ▶ Nexter is said to be close to signing a contract worth an estimated €1.5bn with Qatar for the supply of 490 VBCI armoured vehicles (Al Rayyan programme) in partnership with MBDA, Thales and Kongsberg.
- ▶ In December 2018, KMW signed a contract worth nearly €500m with Hungary to supply 44 Leopard 2A7+ tanks, 24 PzH 2000 self-propelled howitzers, as well as 12 Leopard 2A4 second-hand tanks for training (Zrínyi 2026 programme). Deliveries are expected to start from 2020. In early 2019, KMW also received an order from Norway for six Leguan bridge laying systems on a Leopard 2 chassis and training simulators, with deliveries from 2022 (contract value undisclosed).

Technology and Innovation

- ▶ Nexter devoted 16% of its turnover to R&D in 2018 (approximately €150m).
- ▶ A contract for a system architecture study of the future French-German Main Ground Combat System (MGCS) could be awarded in early 2020 to the three contractors involved in the programme (Rheinmetall Defence, KMW and Nexter).



BUSINESS AREAS

Systems integrator/equipment supplier

- ▶ Missile and air defence systems
- ▶ Commercial and military naval systems
- ▶ Defence systems (turrets and CMS)
- ▶ C4ISR and communication systems
- ▶ Space and aircraft systems (aerostructures, propulsion)

GOVERNANCE

Chairman

E. Reiten

Chief Executive Officer

G. Håøy

President Kongsberg Defence & Aerospace

E. Lie

OWNERSHIP STRUCTURE (as of 20.11.2019)

Symbol	KOG
Listed on	Oslo Stock Exchange
Market Cap (NOKm)	25 144

Major shareholders (as of 20.11.2019)

Norwegian State	50%
Folketrygdfondet	6,65%
FIL Investment Advisors (UK) Ltd.	5,65%
Fidelity Management & Research Co.	3,53%
MP Pensjon PK	3,03%

MAIN JOINT VENTURES AND ASSOCIATES

Name	%	Country
Kongsberg Satellite Services AS	50%	Norway
Patria Oyj	49,9%	Finland
Kta Naval Systems	50%	Norway
AIM Norway	50,1%	Norway

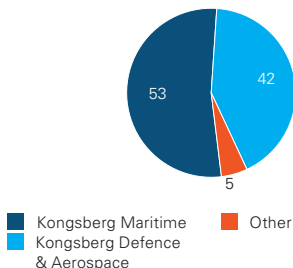
KEY FIGURES (Fiscal year ended: December 31st)

€ millions	2015	2016	2017	2018
Revenue	1 903	1 705	1 554	1 499
Δ (%) [NOK]*	2,52%	-6,97%	-8,55%	-0,75%
Defence (%)	35%	40%	44%	42%
Export (%)	83%	83%	81%	81%
Operating profit/loss	105	74	83	98
Operating margin (%)	5,54%	4,37%	5,33%	6,57%
Net income**	84	70	59	73
Order book	2 041	1 862	1 588	1 737
Employees	7 688	7 159	6 830	6 842

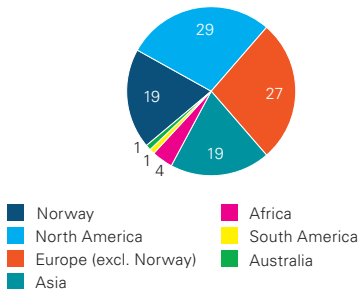
*Variation based on revenue in local currency. See €/NOK exchange rates p.7.

**Net income attributable to shareholders.

REVENUE BY BUSINESS LINE (%)



REVENUE BY REGION (%)



MAIN PROGRAMMES, COOPERATIONS AND EXPORT PARTNERSHIPS

	Thales	PGZ	Raytheon	Northrop Grumman	BAE Systems	Rheinmetall Defence	Marvin Engineering	Magellan Aerospace	Northrop Grumman*	Lockheed Martin	Nammo	Babcock
Defence systems												
PROTECTOR family of Remote Weapon Stations (RWS, MCT, Lite)	●				●		●					
Missile systems												
Penguin anti-ship missile										●		
Naval Strike Missile (NSM)	●	●								●	●	
Joint Strike Missile (JSM)			●	●								
Air defence systems												
National Advanced Surface-to-Air Missile System (NASAMS)		●										
NSM based Coastal Defence System (NSM CDS)												
C4ISR and communication systems												
Kongsberg Tactical Communication System (K-TaCS)		●										
NATO Alliance Ground Surveillance (AGS) System Master Archival/Retrieval Facility information (SMARF)			●									
Naval systems												
MCM C2 tactical system												
PROTEUS training solutions		●										
MSI-90U Mk2 submarine combat management system												
Military aircraft												
F-35 programme (fuselage parts, landing gear, JSM carriage)			●		●			●				

*Innovation Systems division, formerly Orbital ATK

STRATEGIC HIGHLIGHTS

Business trends

- ▶ Kongsberg is a Norwegian company that provides technology systems for the maritime, defence and aerospace industries. The Norwegian State owns a 50% capital interest in the group, whose defence products include missile systems, air defence systems and naval systems. Kongsberg's revenue amounted to NOK 14.4bn (€1.5bn) in 2018, down 0.5% year-on-year due to a decline in activity in the Kongsberg Defence & Aerospace division (-3.6%), which accounted for 42% of total revenue.
- ▶ In early 2019, Kongsberg completed the acquisition of Rolls-Royce's Commercial Marine business, which was fully integrated into the Kongsberg Maritime division. The estimated cost of the acquisition is £500m (€565m).
- ▶ In May 2019, Kongsberg Defence & Aerospace acquired Aerospace Industrial Maintenance Norway (AIM Norway), a company that maintains the Royal Norwegian Air Force's (RNoAF) aircraft and helicopters. AIM Norway will be 50.1% owned by Kongsberg Defence & Aerospace and 49.9% by Patria Oyj, a Finnish aerospace and defence company in which Kongsberg Defence & Aerospace owns a 49.9% stake.

Home market

- ▶ In July 2019, an industrial consortium led by Kongsberg Defence & Aerospace and comprising Thales Norway, Teleplan Globe and IBM, signed a strategic partnership agreement with the Norwegian Defence Material Agency to develop and provide solutions for the processing and dissemination of surveillance information to the Norwegian Army and NATO allies.
- ▶ Kongsberg also continued a testing phase, which is expected to last until 2023, for the integration of the anti-ship Joint Strike Missile (JSM) into Lockheed Martin's F-35 fighter aircraft, as part of a programme funded by the Norwegian government.

Export markets

- ▶ In 2018, new export contracts were signed for the Naval Strike Missile (NSM), which is jointly promoted by Kongsberg and Raytheon, including a €124m contract with the Royal Malaysian Navy to equip 6 ships. The NSM was also chosen to equip the U.S. Navy's LCS frigates. A first contract worth \$14.8m (€13m) was signed in 2018, followed by a second worth \$47.6m (€42.2m) in 2019. The total contract value could reach \$847.6m (€750m) if all options are exercised.
- ▶ Kongsberg further strengthened its positions in Qatar. After having been selected in 2018 to fit Nexter's 490 VBCI 2 vehicles ordered by the Emirati country with remotely operated turrets, the Norwegian group in 2019 won a NOK 5.6bn (€583m) contract to supply the National Advanced Surface-to-Air Missile System (NASAMS) co-developed with Raytheon and integrating the U.S. defence company's AIM-120 AMRAAM missile. Several other NASAMS export contracts were also won, including in Lithuania, Indonesia and Australia.
- ▶ In March 2019, the anti-ship Joint Strike Missile (JSM) was chosen by Japan to equip its fleet of F-35 fighter aircraft.
- ▶ In July 2019, Kongsberg signed a NOK 2bn (€208m) contract with Lockheed Martin to supply components for over 500 F-35 fighter aircraft.
- ▶ In September 2019, Kongsberg signed a new \$42m (€37.5m) contract with the U.S. Army to supply remotely operated turrets as part of the Common Remotely Operated Weapon Station (CROWS) programme, in particular designed to fit Stryker infantry fighting vehicles and M1 Abrams tanks. Total purchase orders now stand at \$390m (€348m).

Technology and Innovation

- ▶ Kongsberg Defence & Aerospace's R&D expenditure reached NOK 98m (€10.5m) in 2018.
- ▶ At the 2019 SubCon International Submarine Conference, Kongsberg, Atlas Elektronik, and Kongsberg Defence & Aerospace, unveiled ORCCA, a new combat system for SSK submarines.



BUSINESS AREAS

Platform manufacturer and systems integrator

- ▶ Commercial and military aircraft
- ▶ Military helicopters
- ▶ UAV
- ▶ Aerostructures
- ▶ Commercial and military aircraft MRO and modernisation
- ▶ Spatial
- ▶ Training

GOVERNANCE

Chief Executive Officer
Head of operations

Ahn Hyun-ho
Hyun-Dae Shin

OWNERSHIP STRUCTURE (as of 20.11.2019)

Symbol	A047810
Listed on	Korea Exchange
Market Cap (KRW/bn)	3 694

Major shareholders (as of 20.11.2019)

South Korean State	26,40%
National Pension Service of Korea	5,34%
The Vanguard Group, Inc.	2,54%
BlackRock Asset Management North Asia Ltd.	2,30%
BlackRock Fund Advisors	1,81%

MAIN JOINT VENTURES AND ASSOCIATES

Name	%	Country
KAI-EC	51%	South Korea

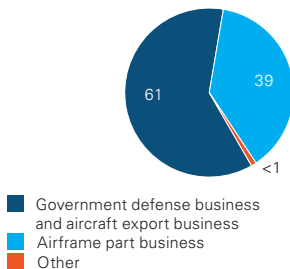
KEY FIGURES (Fiscal year ended: December 31st)

€ millions	2015	2016	2017	2018
Revenue	2 419	2 294	1 623	2 145
Δ (%) [KRW]*	31,31%	-3,07%	-33,17%	34,44%
Defence (%)	N/A	N/A	38%	38%
Export (%)	61%	61%	61%	59%
Operating profit/loss	302	249	-164	113
Operating margin (%)	12,49%	10,86%	-10,08%	5,25%
Net income**	206	206	-184	44
Order book	7 313	7 858	6 944	4 763
Employees	3 512	3 905	3 905	4 142

*Variation based on revenue in local currency.
See €/KRW exchange rates p.7

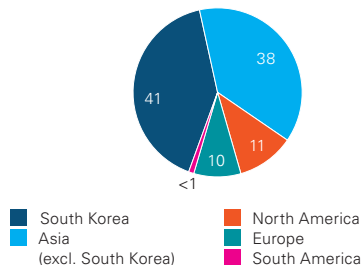
**Net income attributable to shareholders.

REVENUE BY BUSINESS LINE (%)*



*Revenue distribution based on total sales excluding eliminations.

REVENUE BY REGION (%)



MAIN PROGRAMMES, COOPERATIONS AND EXPORT PARTNERSHIPS

	Airbus	Lockheed Martin	TAL	PT Dirgantara Indonesia	Boeing	Hanwha Systems Corporation	Thales Alenia Space
Military aircraft							
KT-1 basic trainer		●					
T-50 advanced trainer	●						
KA-1 tactical control aircraft							
FA-50 light fighter aircraft							
KFX fighter aircraft (under development)	●			●			
Military helicopters							
KUH Surion twin-engine utility helicopter	●						
Single-engine Light Attack Helicopter (LAH)	●						
Unmanned Aerial Vehicle							
Night Intruder-600 Vertical Take-Off and Landing (NI-600 VT) unmanned helicopter							
Aerostructures							
F-15 and AH-64 programmes (fuselage)					●		
MRO & modernisation							
KT-1, KA-1, T-50 and FA-50 aircraft MRO							
ROKN's P-3 maritime patrol aircraft MRO and modernisation							
US Navy's H-53 helicopters and USAF's F-16 aircraft MRO							
ROKAF's C-30 transport aircraft modernisation							
Spatial							
Earth observation radar satellites (425 Project)						●	●
Training systems							
T-50, TA-50 and FA-50 aircraft training systems							

STRATEGIC HIGHLIGHTS

Business trends

- ▶ Korea Aerospace Industries (KAI) is a major aerospace and defence company operating both in civil aviation (aerostructure parts for Airbus and Boeing) and military aviation (future South Korean KF-X fighter aircraft, KUH Surion transport helicopter, etc.). The group also operates in the space sector. Its turnover reached KRW 2,786bn (€2.1bn) in 2018. Defence activities accounted for 38% of sales.
- ▶ In 2018, KAI acquired TASS Inc, a company that designs and manufactures avionics and high-tech military equipment for the aerospace and defence industries.
- ▶ KAI announced that it recruited more than 700 employees in 2018 to support the joint South Korean and Indonesian fighter aircraft development programme (KF-X programme).
- ▶ In September 2019, Ahn Hyun-ho succeeded Kim Jo-won as Chief Executive Officer.

Home market

- ▶ KAI is a key supplier to the South Korean Army. Since 2015, the company has in particular been the prime contractor for the KF-X programme (future South Korean fighter aircraft) alongside the South Korean Agency for Defense Development (ADD). Designed to replace the South Korean and Indonesian Air Forces' respective fleets of fighter aircraft, the KF-X fighter aircraft (named IF-X in Indonesia) is expected to be comparable to a 5th-generation aircraft. Around 60% and 20% of the programme will be funded by the South Korean and Indonesian governments, respectively, while South Korean defense companies will make 20% of contribution.
- ▶ KAI is also in charge of developing the Light Attack Helicopter (LAH) and Light Civil Helicopter (LCH). Produced as part of the South Korean government's civil and military helicopter development programme, LAH and LCH share more than 60% of their components. The LAH is expected to enter service in 2023. The LCH will be operational in 2021. As the main partner, Airbus Helicopters is co-developing and co-manufacturing the aircraft with KAI and will receive 50% in value from the LCH programme and 20% from the LAH programme.
- ▶ Under a contract signed in 2017, KAI is also to deliver 30 KUH-1 Surion transport helicopters (designed in partnership with Airbus) to the South Korean Navy by 2023.
- ▶ In the space sector, KAI participates in the 425 Project programme (radar observation satellites for the ADD) alongside Thales and Hanwha Systems Corporation (HSC). As part of this programme, Thales will train KAI and HSC teams in the design of Synthetic Aperture Radar (SAR) technology.

Export markets

- ▶ With 38% of sales, Asia is the group's main export market. KAI aims to strengthen its international presence with the T-50 and KT-1 training aircraft, the FA-50 fighter aircraft (based on the T-50), and the KUH Surion transport helicopter.
- ▶ In 2018, KAI signed two contracts with the Indonesian Air Force to supply three additional KT-1B trainer aircraft - in addition to the 12 aircraft already in service - and to upgrade the T-50i trainer aircraft (a variant of the T-50 trainer aircraft). The total value of the contracts amounts to approximately KRW 100bn (approximately €77m).
- ▶ T-50 training aircraft are also in service in Thailand (T-50TH variant). In 2019, KAI won a modernisation contract for the Thai Air Force's T-50THs (KRW 62.3bn, or €47.8m). The group is also continuing its efforts to export the T-50 to Malaysia and Argentina.
- ▶ KAI and Lockheed Martin's joint offer for the future USAF T-X training aircraft was not accepted. The tender was won in August 2019 by Boeing (in partnership with Saab AB), which will supply the T-7A Red Hawk.

Technology and Innovation

- ▶ In 2019, the group successfully completed the flight tests of the NI-600VT UAV.



BUSINESS AREAS

Systems integrator/equipment supplier

- ▶ ISR systems
- ▶ Electronic warfare
- ▶ Communication systems
- ▶ Avionics
- ▶ Air traffic control
- ▶ Space (navigation payloads)
- ▶ Training

GOVERNANCE

Chairman and CEO
Chief Operating Officer
Chief Financial Officer

William M. Brown
Christopher E. Kubasik
Jesus Malave

OWNERSHIP STRUCTURE (as of 20.11.2019)

Symbol	LHX
Listed on	NYSE
Market Cap (\$m)	44 909

Major shareholders (as of 20.11.2019)

The Vanguard Group, Inc.	8,08%
T. Rowe Price Associates, Inc. (Investment Management)	6,36%
SSgA Funds Management, Inc.	4,20%
Henderson Global Investors Ltd.	3,08%
Iridian Asset Management LLC	3,06%

MAIN JOINT VENTURES AND ASSOCIATES

Name	%	Country
IBL LLC	33%	United States
Aviation Communication & Surveillance Systems LLC (ACSS)	70%	United States
AYESAS	40%	Turkey
Global Military Aircraft Systems LLC (GMAS)	49%	United States

KEY FIGURES (Fiscal year ended: December 31st)

€ millions	2017 (L3 Technologies)	2017** (Harris Corporation)	2018*** (L3Harris Technologies)
Revenue	8 472	5 221	14 018
Δ (%) / \$)*	3,94%	-1,54%	-
Defence (%)	81%	74%	N/A
Export (%)	23%	22%	23%
Operating profit/loss	912	950	~2 000
Operating margin (%)	10,77%	18,19%	~14,8%
Net income****	599	489	N/A
Order book	7 405	5 333	N/A
Employees	31 000	17 000	~50 000

* Variation based on revenue in local currency.

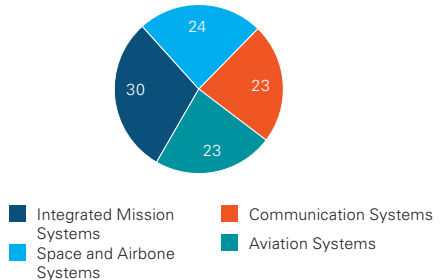
See €/\$ exchange rates p.7.

** Fiscal year ended: June 30th.

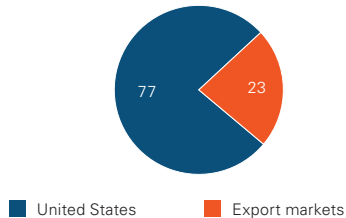
*** 2018 financial statements consolidated after merger.

**** Net income attributable to shareholders.



























REVENUE BY BUSINESS LINE (%)



REVENUE BY REGION (%)



MAIN PROGRAMMES, COOPERATIONS AND EXPORT PARTNERSHIPS

	Boeing	Collins Aerospace*	BAE Systems	Northrop Grumman	Lockheed Martin	Textron	Imma/sat
ISR systems							
 SPYDR and SPYDR II tactical aircraft							
 EC-130H USAF programme (systems integration and maintenance of 14 USAF's EC-130H)							
 MX-15 electro-optical and infrared sensors							
 AN/SPS-48G surveillance radar							
Space							
 Navigation payloads for GPS III satellite							
Electronic warfare							
 ALQ-214 IDECM F/A-18 countermeasure system							
 Advanced Integrated Defensive Electronic Warfare Suite (AIDEWS)							
Avionics							
 F-15 and F/A-18 avionics							
 USAF's C-130 Avionics Modernization Programme (AMP)							
Communication systems							
 Tactical SATCOM terminals (Panther, Hawkeye, Cheetah)							
 Xenon Ion propulsion system (702sp satellite)							
 hC2 Battlefield Management System (BMS)							
 Falcon family of radios							
Training							
 USAF's B-2 training system programme							

*Formerly Rockwell Collins, UTC group

STRATEGIC HIGHLIGHTS

Business trends

- ▶ L3Harris Technologies was formed by the June 2019 merger between U.S. defence companies L3 Technologies (\$9.6bn, or €8.5bn, in revenue in 2017) and Harris Corporation (\$5.9bn, or €5.2bn, in revenue in 2017). Former Harris Corp. shareholders hold 54% of the new entity and L3 shareholders the remaining 46%. With nearly \$17bn (€14bn) in revenue in 2018 and 50,000 employees, L3Harris Technologies ranks as the 6th largest defence group in the United States and one of the top 10 worldwide.
- ▶ William M. Brown, former CEO of Harris Corporation, was appointed Chairman and CEO of L3Harris Technologies, while Christopher E. Kubasik, former CEO of L3 Technologies, became Chief Operating Officer.
- ▶ The group's activities are organised around 4 divisions: Integrated Mission Systems (ISR systems, electro-optical sensors), Space and Airborne Systems (cyber defence, defence electronics), Communication Systems (tactical communications solutions) and Aviation Systems (aviation products, training systems).
- ▶ In September 2019, L3Harris completed the sale of Harris Corporation's Night Vision business to Elbit Systems of America, the Israeli group's U.S. subsidiary, for \$350m (€311m). The transaction was part of the regulatory process imposed by U.S. competition authorities to approve the L3 Technologies-Harris merger.

Home market

- ▶ The U.S. market is crucial for L3Harris Technologies (77% of revenue). The U.S. Department of Defense alone accounted for 56% of the group's sales in 2018.
- ▶ In 2019, Harris Corporation was awarded a \$212m (€188m) contract to supply electronic jammers for the U.S. Navy's F/A 18 Hornet and Super Hornet fighter aircraft as well as those exported under FMS procedures. Harris Corporation was also selected by the United States Marine Corps to upgrade its AN/PRC-117G radio fleet, a contract worth \$75m (€67m).
- ▶ L3 Technologies also won new contracts from the U.S. Air Force, including a \$120m (€107m) contract to train pilots, maintainers and weapons-loading personnel of the B-2 bomber fleet, as well as a \$499m (€444m) contract for an avionics upgrade of 176 C-130H transport aircraft.

Export markets

- ▶ The group generated 23% of its sales from exports in 2018. Australia, Canada and the United Kingdom are among the group's main international markets.
- ▶ In a tender for the design of 15 new frigates for the Royal Canadian Navy (Canadian Surface Combatant (CSC) programme), the Canadian government selected a joint bid led by Lockheed Martin Canada, in partnership with BAE Systems (which provided a design based on its Type 26 frigate that is being built for the U.K.), CAE, MDA, L3 Technologies and Ultra Electronics. The ships will be built at Irving Shipbuilding's Halifax Shipyard. As part of the bid, L3 will be providing the Integrated Platform Management System, integrated communication systems, and electro-optical infrared (EO/IR) sensors, among others.
- ▶ The Royal Australian Air Force awarded L3 Technologies a contract worth approximately \$1bn (€888m) to supply four Gulfstream G550 aircraft - to be designated the MC-55A Peregrine - modified to integrate Airborne Intelligence, Surveillance, Reconnaissance, and Electronic Warfare (AISREW) systems. L3 will also be involved as a subcontractor in the Royal Australian Navy's SEA 5000 programme for the delivery of 9 Hunter-class frigates, a contract for which BAE Systems was designated as the prime contractor.
- ▶ In June 2019, L3 Technologies and state-owned defence company Saudi Arabian Military Industries (SAMI) set up a joint venture to cooperate on electro-optical and infrared systems projects in Saudi Arabia.

Technology and Innovation

- ▶ At the 2019 Defence & Security Equipment International (DSEI) arms fair held in London, L3Harris unveiled the T4 multi-mission robotic system, a ground-based robot designed for security operations in restricted areas.



BUSINESS AREAS

Platform manufacturer and systems integrator

- ▶ Aeronautics
- ▶ Defence electronics
- ▶ Helicopters
- ▶ Defence systems
- ▶ Space systems

GOVERNANCE

Chairman	G. de Gennaro
Chief Executive Officer	A. Profumo
Manufacturing and Program	
Management Optimization Director	F. Barsotti

OWNERSHIP STRUCTURE (as of 20.11.2019)

Symbol	LDO
Listed on	Borsa Italiana
Market Cap (€m)	6 461

Major shareholders (as of 20.11.2019)

Ministry of Economy and Finance (Italy)	30,20%
Capital Research & Management Co. (World Investors)	3,64%
Norges Bank Investment Management	2,87%
Fidelity Management & Research Co.	2,32%

MAIN JOINT VENTURES AND ASSOCIATES

Name	%	Country
NHIndustries SAS	32%	France
Elettronica Spa	31,33%	Italy
Telespazio Spa	67%	Italy
Thales Alenia Space	33%	France
MBDA SAS	25%	France
Eurofighter Jagdflugzeug GmbH	21%	Germany
ATR	50%	France
Avio Spa	25,88%	Italy

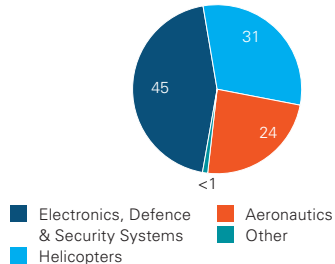
KEY FIGURES (Fiscal year ended: December 31st)

€ millions	2015	2016	2017*	2018
Revenue	12 995	12 002	11 734	12 240
Δ (%)	1,81%	-764%	-2,23%	4,31%
Defence (%)	65%	64%	N/A	N/A
Export (%)	84%	82%	84%	85%
Operating profit/loss	884	982	844	715
Operating margin (%)	6,80%	8,18%	7,19%	5,84%
Net income**	487	505	277	509
Order book	28 793	34 798	33 507	36 118
Employees	47 156	45 631	45 134	46 462

*2017 figures restated.

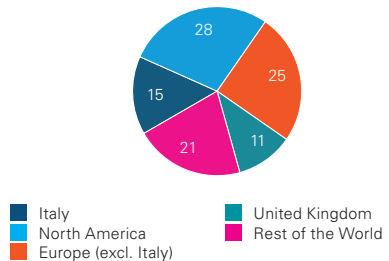
**Net income attributable to shareholders.

REVENUE BY BUSINESS LINE (%)*



*Excluding revenue from Space Systems division (Telespazio and Thales Alenia Space).

REVENUE BY REGION (%)



MAIN PROGRAMMES, COOPERATIONS AND EXPORT PARTNERSHIPS

	KHI	Boeing	Airbus	Naval Group	Dassault Aviation	Saab AB	General Dynamics	BAE Systems	Northrop Grumman*	Lockheed Martin	Electronica	PGZ
Military aircraft and UAS												
Tempest future fighter aircraft (sensors, electronics, avionics)								●			●	
F-35 Lightning fighter aircraft (assembly**)									●			
Eurofighter Typhoon fighter aircraft			●				●					
M-345 and M346/T-100 advanced trainer aircraft		●										●
C-27J Spartan and MC-27J Praetorian tactical airlifter								●		●		
European MALE RPAS			●		●							
nEUROn UCAV demonstrator (smart bomb bay, electrical system and various subsystems)					●							
Military helicopters												
AW249 future attack helicopter												●
AW159 twin-engine multi-role helicopter (6t)						●						
AW139M/MH-139 twin-engine multi-role helicopter (6t)		●										
NH90 twin-engine multi-role helicopter (11t)			●								●	
AW101/MCH-101 three-engine helicopter (16t)	●											
Weapons and artillery systems												
Vulcano 127/64 lightweight naval gun												
Black Shark heavyweight torpedo and MU90 lightweight torpedo				●								
Defence electronics												
E-CAPTOR AESA radar (Eurofighter)			●				●					
Raven ES AESA radar (Gripen JAS 39 E/F)						●						
Kronos radar family												

*Innovation Systems division, formerly Orbital ATK ** Designed for the Royal Netherlands Air Force and the Italian Air Force

STRATEGIC HIGHLIGHTS

Business trends

- ▶ Leonardo (formerly Finmeccanica) is Italy's leading defence group. A platform manufacturer and systems integrator, the group is organised into four divisions: Electronics, Defence and Security Systems (radars, torpedoes and naval guns, etc.), Helicopters (civil and military aircraft), Aeronautics (combat, transport and training aircraft, etc.) and Space. The latter includes Leonardo's share in Telespazio (67% owned by Leonardo, 33% by Thales) and Thales Alenia Space (67% owned by Thales, 33% by Leonardo) which together form the Space Alliance.
- ▶ Leonardo's turnover reached €12.2bn in 2018, up 4.3% year-on-year. The Helicopters division recorded the strongest growth (+10.9%), driven by higher deliveries (177 units, compared with 149 in 2017).
- ▶ In January 2019, Leonardo completed the acquisition of the entire capital of Italian electronics company Vitrociset (€163m in revenue in 2017, around 1,000 employees, of which 630 in Italy) for a total of €46m.

Home market

- ▶ Leonardo is one of the main suppliers to the Italian Armed Forces. The group participates in the design and production of aircraft and helicopters for Italy and collaborates in most of Fincantieri's programmes, in particular through their joint subsidiary Orizzonte Sistemi Navali. In 2018, it generated 15% of its turnover in its home market.
- ▶ In June 2019, the group signed a €300m contract with the Italian Air Force to supply thirteen M-345 training aircraft (the first unit of which is due to be delivered in 2020), ground training systems, as well as logistics support services for five years. Italy, which already ordered five M-345 aircraft in January 2017, could eventually order up to 45 units to replace its fleet of MB-339 aircraft.
- ▶ In July 2018, the Italian Army awarded the Iveco Oto-Melara consortium (formed by Leonardo and Iveco Defence Vehicles) a €159m contract (of which €92m for Leonardo) for the delivery of the first 10 Centauro II tanks (including spare parts and logistics services) out of a total order of 136 units.

Export markets

- ▶ The group generated 85% of its revenue from exports in 2018, mainly to the United States and the United Kingdom (40% of turnover), through its subsidiaries Leonardo DRS and Leonardo US Aircraft on the one hand and Leonardo UK on the other.
- ▶ In September 2018, Leonardo and Boeing won the U.S. Air Force's tender to replace Bell Helicopter's (Textron) UH-1N Huey transport helicopters. The contract, estimated at \$2.4bn (€2.1bn), covers the supply of 84 aircraft which are to be delivered by 2031. The two partners will provide the MH-139 helicopter, based on Leonardo's AW139. The Italian group will be in charge of assembling the helicopters in the United States.
- ▶ In early 2019, the NHIndustries consortium (formed by Leonardo, Airbus Helicopters and Fokker Aerostructures) signed a €1.4bn contract with Spain to supply 23 NH90 helicopters. In August 2019, the German Navy also chose the NH90 to replace its 22 Westland Sea Lynx anti-submarine warfare helicopters.
- ▶ In September 2019, the British Ministry of Defence chose Leonardo UK and Thales UK to equip the Royal Air Force's eight Shadow R1 intelligence aircraft with the DAS (Defensive Aids System) protection system. Designed and produced in the United Kingdom, with a targeted initial operating capability from 2021, the DAS system offers protection against the latest generation of infrared missiles.

Technology and Innovation

- ▶ The group's R&D expenses amounted to €1.44bn (11.8% of total revenue) in 2018, down 6.4% compared to 2017.
- ▶ In September 2019, Leonardo's Polish subsidiary PZL Swidnik's and Poland's PGZ group unveiled a next-generation military helicopter concept called W-3, which is based on PZL Swidnik's PZL W-3 Sokół model.



BUSINESS AREAS

Platform manufacturer and systems integrator

- ▶ Aeronautics (aircraft, helicopters, UAS)
- ▶ Missiles, guided weapons and missile defence
- ▶ Naval systems (surface ships, combat systems)
- ▶ Defence electronics and cybersecurity
- ▶ Space (satellites and launchers)

GOVERNANCE

Chairwoman and CEO	Marillyn A. Hewson
Executive VP Aeronautics	Michele Evans
Executive VP Rotary and Mission Systems	Frank A. St. John

OWNERSHIP STRUCTURE (as of 20.11.2019)

Symbol	LMT
Listed on	NYSE
Market Cap (\$m)	110 366

Major shareholders (as of 20.11.2019)

SSgA Funds Management Inc.	15,40%
The Vanguard Group Inc.	7,69%
Capital Research & Management Co. (World Investors)	5,98%
Putnam LLC	5,27%
Wellington Management Co. LLP	4,14%

MAIN JOINT VENTURES AND ASSOCIATES

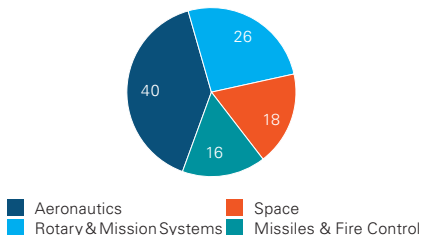
Name	%	Country
AWE PLC	51%	United Kingdom
MEADS International Inc.	58%	United States
United Launch Alliance LLC	50%	United States
Tata Lockheed Martin Aerostructures Limited	50%	India
Raytheon-Lockheed Martin Javelin JV	50%	United States
TLVS GmbH	50%	Germany

KEY FIGURES (Fiscal year ended: December 31st)

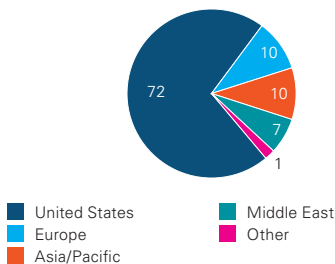
€ millions	2015	2016**	2017**	2018
Revenue	41 560	42 719	44 212	45 522
Δ (%)/[\$]*	1,17%	2,51%	5,65%	7,61%
Defence (%)	~90%	89%	88%	88%
Export (%)	N/A	27%	29%	28%
Operating profit/loss	4 525	4 294	4 642	4 943
Operating margin (%)	10,89%	10,05%	10,50%	10,86%
Net income	3 248	4 673	1 737	4 273
Order book	91 460	98 157	87 984	113 946
Employees	126 000	97 000	100 000	105 000

*Variation based on revenue in local currency. See €/\$ exchange rates p.7
 **2016 and 2017 figures restated.

REVENUE BY BUSINESS LINE (%)



REVENUE BY REGION (%)



MAIN PROGRAMMES, COOPERATIONS AND EXPORT PARTNERSHIPS

	MHI	TASL	Raytheon	BAE Systems	Northrop Grumman	Pratt & Whitney*	General Electric	Rolls-Royce	Leonardo	General Dynamics	Fincantieri	Gibbs & Cox	Boeing	TAI
Military aircraft														
F-35 Lightning II multi-role fighter aircraft	●		●	●	●		●							●
F-16 Fighting Falcon fighter aircraft		●			●	●								
C-130J Super Hercules tactical airlifter							●							
SB>1 Defiant multi-role helicopter												●		
King Stallion CH-53K three-engine helicopter						●								
Sea Hawk (SH-60/S-70B) and Black Hawk (UH-60 / S-70A) twin-engine multi-role helicopters						●								
Missile and defence systems														
Hellfire and Javelin anti-tank missiles			●	●										
Joint Air-to-Surface Standoff Missile (JASSM)				●										
Trident II Submarine-Launched Ballistic Missile (SLBM) (D5)														
PAC-3 and PAC-3 MSE interceptors			●											
THAAD missile defence system			●	●										
Surface ships														
Freedom-class Littoral Combat Ship (LCS)				●						●	●			
MMSC frigate (Multi-Mission Surface Combatant)**										●	●			
CSC frigate (Canadian Surface Combatant)***				●										
Combat and mission system														
AEGIS combat system														
Space														
Vulcan (launcher)													●	

*UTC group **Based on Freedom-class LCS ***Based on BAE Systems' Type 26 frigates

STRATEGIC HIGHLIGHTS

Business trends

- ▶ With sales of \$53.8bn in 2018 (€45.5bn, up 7.6% year-on-year in local currency), of which approximately 88% in the defence sector, Lockheed Martin is the world's largest defence contractor and the leading supplier to the U.S. Department of Defense.
- ▶ The group is organised in 4 divisions. In 2018, growth was driven by the Missile & Fire Control (+16.2%) and Aeronautics (+9.4%) divisions.
- ▶ In July 2018, Lockheed Martin announced it had recruited more than 1,800 employees to increase production rates of its F-35 fighter aircraft. At the same time, the group opened a new factory in Pinellas Park (FL), expanded its Orlando site (FL) and relocated the production of F-16 aircraft from Fort Worth (TX) to Greenville (SC), enabling the Texas site to focus exclusively on the production of F-35.

Home market

- ▶ Lockheed Martin remains highly dependent on the U.S. market (72% of its revenue in 2018). The U.S. Department of Defense, its largest and most important customer, accounted for 60% of its sales, excluding FMS procedures.
- ▶ In September 2018, the group signed a \$7.2bn (€6.1bn) contract with the U.S. Air Force to supply 22 GPS III satellites (GPS Block IIIIF). As a successor to the GPS IIIA, these satellites will provide a higher positioning accuracy. The 22 satellites are expected to be launched between 2026 and 2034.
- ▶ In January 2019, the U.S. Navy ordered a 16th Freedom-class frigate (LCS-31), whose construction will begin at the end of 2019. Lockheed Martin (prime contractor) and Marinette Marine, Fincantieri's U.S. subsidiary (manufacturer) are partners in this programme. A total of 20 units could be ordered by the U.S. Navy.
- ▶ In May 2019, Lockheed Martin was awarded a \$1.13bn (€1bn) contract by the U.S. Navy to supply 12 CH-53K King Stallion heavy lift cargo helicopters to the U.S. Marine Corps, with delivery starting in 2022. The U.S. Navy plans to receive 200 units of the helicopter by 2029, at a total cost of \$25bn (€21.2bn).
- ▶ The U.S. government and Lockheed Martin completed a \$34bn (€30bn) agreement for the production and delivery of 478 F-35 Lightning II fighter aircraft to the U.S. Armed Forces and international partners (including Foreign Military Sales procedures).

Export markets

- ▶ The group generated less than 30% of its revenue from exports in 2018, down 0.5 percentage points from 2017. A large part of international sales are made through FMS procedures.
- ▶ In October 2018, Belgium chose Lockheed Martin's F-35 Lightning II to replace its fleet of F-16 Fighting Falcon fighters. Estimated at €3.6bn, the contract covers the delivery of 34 aircraft between 2023 and 2030.
- ▶ In November 2018, Saudi Arabia signed a \$15bn (€12.7bn) contract for the acquisition of Lockheed Martin's THAAD anti-missile defence system, including 44 launchers, 360 interceptor missiles, 16 communication stations and seven radars.
- ▶ The group entered several partnerships in Germany (with MBDA Deutschland on the TLVS programme, and with Rheinmetall Defence to supply the CH-53K helicopter to the German Armed Forces), Norway (with AIM Norway, whose acquisition by Kongsberg and Patria was announced this year, for a F-16 maintenance centre), Romania (with Romaero for a UH-60 maintenance centre), or India (with TASN to produce the F-16-derived F-21 fighter jet if India chooses it over competing bids from Boeing, Dassault Aviation, UAC, Saab AB and Eurofighter, as part of a programme for 114 multi-role fighter aircraft).

Technology and Innovation

- ▶ R&D expenses increased 8.3% to reach \$1.3bn (€1.1bn) in 2018, representing 2.4% of total revenue.



BUSINESS AREAS

Platform manufacturer and systems integrator

- ▶ Military shipbuilding (offshore patrol vessels, frigates, corvettes, mine-hunting vessels, etc.)
- ▶ Commercial shipbuilding (luxury yachts)
- ▶ Repair, refit and modernisation
- ▶ Training services
- ▶ Maritime infrastructures

GOVERNANCE

Chairman and CEO

Peter Lürssen

KEY FIGURES (clôture de l'exercice : December 31st)

€ millions	2015	2016	2017	2018
Revenue	568	763	1 467	N/A
Δ (%)	-33,54%	34,33%	92,29%	N/A
Defence (%)	N/A	N/A	N/A	N/A
Export (%)	N/A	N/A	N/A	N/A
Operating profit/loss	N/A	N/A	N/A	N/A
Operating margin (%)	N/A	N/A	N/A	N/A
Net income	N/A	N/A	N/A	N/A
Order book	N/A	N/A	N/A	N/A
Employees	1 708	2 078	2 676	N/A

OWNERSHIP STRUCTURE

Symbol

Listed on

Market Cap

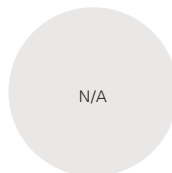
Unlisted group

Major shareholders (as of 20.11.2019)

Lürssen Family

100%

REVENUE BY BUSINESS LINE (%)



MAIN JOINT VENTURES AND ASSOCIATES

Name	%	Country
AMSEG	N/A	Australia
Muara Maritime Services	N/A	Brunei

REVENUE BY REGION (%)



MAIN PROGRAMMES, COOPERATIONS AND EXPORT PARTNERSHIPS

	Saab AB	ASC	Civmec	TKMS	L3Harris Technologies*	German Naval Yards**	Atlas Elektronik**	Rheinmetall	Darussalam Assets	Abeking & Rasmussen	Perdik Shipyard Istanbul	Alenia Marconi	Thales
Naval vessels													
OPV 80 Darussalam-class offshore patrol vessel													
Arafura-class offshore patrol vessel (SEA 1180 programme)***	●	●	●		●								
F125 Baden-Württemberg-class frigate				●				●					
K130 Braunschweig-class corvette****			●		●	●	●	●					●
MJ 332 Frankenthal-class mine-hunting vessel								●		●			
MHV 54 Alanya-class mine-hunting vessel*****									●	●	●		
FIB 125 Mustaed-class patrol boat													
CSB 40 patrol boat													
EGV Type 702 (Berlin, Frankfurt, Bonn) naval support vessels													
Repair, refit and modernisation													
Full service support for the entire Royal Brunei Navy's fleet								●					

*Merger of L3 Technologies and Harris Corporation

**TKMS

***Based on OPV 80-class offshore patrol vessel

****Based on TKMS' MEKO 100 frigate

*****Based on Turkey's MJ 332 Frankenthal-class

STRATEGIC HIGHLIGHTS

Business trends

- ▶ Lürssen is a German shipbuilding company that manufactures naval ships and patrol vessels for coast guards, but also designs and builds custom luxury yachts. Military ships are built in Germany in one of the group's eight shipyards, but also internationally, under licence or as part of joint ventures.
- ▶ Lürssen's acquisition of Hamburg-based shipbuilding company Blohm+Voss from Star Capital Partners in 2016 strengthened its position in the military segment. The two companies had already collaborated in the past, particularly on F125 frigates for the German Navy.

Home market

- ▶ Lürssen is a key supplier to the German Navy, and as such participates, like TKMS (a subsidiary of ThyssenKrupp AG) and German Naval Yards Kiel (a subsidiary of Privinvest), in the country's main maritime defence programmes.
- ▶ The group is part of the ARGE F125 consortium, led by TKMS, which supplies the F125 Baden-Württemberg-class frigates to the German Navy. Lürssen mainly builds the front parts of the frigates in its Bremen and Wolgast shipyards. The first frigate was commissioned in June 2019, two years later than planned due to various technical problems. The second vessel should be delivered by the end of the year, and the last two within two years.
- ▶ Lürssen is also participating alongside TKMS and German Naval Yards Kiel in the construction of the German Navy's five new K130 Braunschweig-class corvettes. These are due to be delivered in 2023 and will complement the first five corvettes of the programme, which are set to be delivered between 2008 and 2013. Thales Deutschland and Atlas Elektronik (a subsidiary of TKMS), partners within the FÜWES K130 consortium, supply the corvettes' combat system.

Export markets

- ▶ In 2017, Lürssen created a new subsidiary, Luerssen Australia, dedicated to the SEA 1180 programme (construction of 12 Arafura-class offshore patrol vessels (OPV) based on the design of Lürssen's OPV-80-class patrol vessel, including four vessels already built in Germany for Brunei, for an estimated value of of \$AUD 3.6bn, or €2.3bn). In May 2018, the group also founded the AMSEG joint venture (Australian Maritime Shipbuilding & Export Group) with Australian construction and engineering company Cimvec.
- ▶ As part of the SEA 1180 programme, Lürssen has partnered with the Australian subsidiaries of L3 (now L3Harris Technologies) and Saab AB, as well as with local shipbuilding companies ASC and Cimvec. Construction of the first Arafura-class offshore patrol vessel began in 2018 at ASC's Osborne shipyard, which is in charge of building the first two units. The following 10 will be built at Cimvec's Henderson facility from 2020.
- ▶ In March 2019, Muara Maritime Services, a joint venture between Lürssen and Brunei-based Darussalam Assets, won a maintenance support contract covering the entire fleet of the Royal Brunei Navy, including the four Darussalam-class OPV-80s delivered by Lürssen between 2011 and 2014.
- ▶ Following the German government's ban on arms exports to Saudi Arabia in October 2018, Lürssen is no longer able to deliver ships ordered by the Royal Saudi Navy in 2014 as part of a contract estimated at €1.5bn. Approximately 140 vessels were ordered (patrol vessels, interceptors, etc.), including 79 FIC 1650 interceptors that were subcontracted to French shipbuilding company Couach and have been delivered to the Saudi Coast Guard.
- ▶ Lürssen is in competition with Italy's Fincantieri and the Bulgarian shipbuilding company MTG Dolphin for the construction of two offshore patrol boats for the Bulgarian Navy. The contract, worth an estimated BGN 984m (€503m), is to be awarded by the end of 2019. The first vessel is scheduled for delivery in 2023, the second in 2024.



BUSINESS AREAS

Missiles producer

- ▶ Air dominance (air-to-air missile, air-to-ground missile, guided missile system, cruise missile)
- ▶ Battlefield engagement (anti-tank missile, anti-tank unmanned ground vehicle)
- ▶ Ground based air defence
- ▶ Maritime superiority (anti-ship missile system, naval air defence system, naval cruise missile)

GOVERNANCE

Chairman and CEO	Éric Béranger
Executive Group Director Programmes	Stéphane Reb
Chief Financial Officer	Peter Bols

OWNERSHIP STRUCTURE

Symbol	
Listed on	Unlisted group
Market Cap	

Major shareholders (as of 20.11.2019)

Airbus	37,5%
BAE Systems	37,5%
Leonardo	25,0%

MAIN JOINT VENTURES AND ASSOCIATES

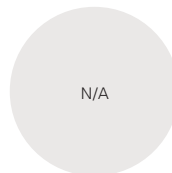
Name	%	Country
Eurosam	66,6%	France
TAURUS Systems GmbH	66,6%	Germany
Roxel	50%	France
PARSYS GmbH	50%	Germany
L&T MBDA Missile Systems	49%	India
MEADS International Inc.	42%	United States
Inmize	40%	Spain
TLVS GmbH	50%	Germany
RAM System GmbH	50%	Germany

KEY FIGURES (Fiscal year ended: December 31st)

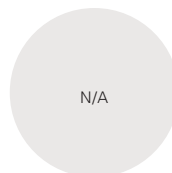
€ millions	2015	2016	2017*	2018
Revenue	2 875	2 955	2 982	3 164
Δ (%)	-9,13%	2,78%	0,91%	6,10%
Defence (%)	100%	100%	100%	100%
Export (%)	43%	50%	N/A	N/A
Operating profit/loss	218	213	201	239
Operating margin (%)	7,58%	7,21%	6,74%	7,55%
Net income**	283	-2	346	244
Order book	15 100	15 900	16 800	17 400
Employees	10 000	10 338	10 700	11 300

*2017 figures restated.
 **Total comprehensive income.

REVENUE BY BUSINESS LINE (%)



REVENUE BY REGION (%)



MAIN PROGRAMMES, COOPERATIONS AND EXPORT PARTNERSHIPS

	Thales	Saab AB	Diehl Defence	Airbus	Indra Sistemas	Lockheed Martin	Safran	Dassault Aviation	Naventia	Millerm
Air dominance										
Brimstone long range air to ground missile										
Meteor beyond visual range air-to-air missile		●		●	●				●	
MICA and MICA NG medium range air-to-air missile	●						●			
SCALP-EG / Storm Shadow air-launched long range deep strike weapon										
TAURUS KEPD 350E modular stand-off missile system for precision strikes		●								
Viper-E high precision air to ground missile										
SPECTRA self-protection system	●							●		
Battlefield engagement										
MMP anti-tank land combat missile system										
Trigat-LR / PARS 3 LR high precision fire-and-forget weapon system			●							
Mistral short range surface-to-air missile						●				
Anti-tank unmanned ground vehicle										●
Spectre UAV										
Ground based air defence										
CAMM and CAMM ER common anti-air modular missile	●									
SAMP/T surface-to-air missile defence system	●									
Medium Extended Air Defense System (MEADS) project						●				
Maritime superiority										
Sea VeNom-ANL lightweight anti-surface guided weapon										
ASTER 15 and 30 surface-to-air missiles	●									
Exocet MM38 and MM40 anti-ship missile systems										
Naval Cruise Missile (MdcN - NCM)										
Future Cruise (FC) / Anti-Ship Weapon (ASW)										

STRATEGIC HIGHLIGHTS

Business trends

- ▶ MBDA is a France-based European defence company and one of the world's leading manufacturers of missiles. Its shareholder structure has remained unchanged since the group's creation in 2001: BAE Systems and Airbus each hold 37.5% of the capital, with Leonardo holding the remaining 25% stake.
- ▶ MBDA's consolidated revenue reached €3.2bn in 2018 (+6.1% year-on-year). The company reported growth both in its domestic markets (Germany, France, Italy, United Kingdom) and on export markets.
- ▶ The group's order book increased 3.6% to a record €17.4bn in 2018, representing more than 5 years of revenue. However, with the intensification of competition in Europe, particularly from U.S. contractors, order intake fell for the second consecutive year, to €4bn in 2018 (compared to €4.2bn in 2017, and €5.2bn in 2016).
- ▶ MBDA is pursuing an ambitious recruitment plan. After hiring 1,200 employees in 2018, the group plans to recruit an additional 1,000 employees in 2019, including 500 in France.
- ▶ In June 2019, Eric Béranger, former head of Airbus' space activities, was appointed Chairman and Chief Executive Officer of MBDA, replacing Antoine Bouvier, who in turn joined Airbus as Director of Strategy, Mergers and Acquisitions and Public Affairs.

Home markets (France, Germany, United Kingdom, Italy)

- ▶ In March 2018, MBDA UK signed a £400m (€450m) contract with the U.K. Ministry of Defence to extend the service life of the country's Brimstone air-to-surface missile beyond 2030. The missile will initially be used by Royal Air Force Typhoon fighter aircraft, then carried by MQ-9B Protector RPAS drones (supplied by General Atomics) and Apache attack helicopters.
- ▶ In November 2018, France's DGA awarded MBDA France a contract worth nearly €900m to supply 567 MICA NG missiles and upgrade 300 MICA missiles. The MICA NG missiles will be delivered between 2026 and 2031. They will replace the MICA missiles currently deployed on the refurbished Rafale, Mirage 2000-5 and Mirage 2000-D fighter aircraft. The contract also involves Roxel, Safran and Thales for seeker technologies and propulsion systems.
- ▶ In June 2019, TLVS GmbH, a joint venture between MBDA Deutschland and Lockheed Martin, submitted its Medium Extended Air Defense System (MEADS) to the Federal Office of Bundeswehr Equipment, to be used as the foundation for Germany's future air and missile defense system (Taktisches Luftverteidigungssystem, or TLVS). The programme, whose cost is estimated at €3.5bn, puts TLVS in competition with Raytheon's Patriot system (in partnership with Rheinmetall Defence).

Export markets

- ▶ In September 2018, MBDA UK signed a contract worth around £1bn (approximately €1.1bn) to supply Meteor air-to-air and Brimstone air-to-ground missiles to the Qatar Air Force to equip its 24 Typhoon fighter aircraft.
- ▶ In June 2019, MBDA France won a €200m contract to supply around 100 Meteor air-to-air missiles to the Brazilian Air Force's 36 Gripen JAS-39 E/F fighter aircraft acquired in 2014. The missiles are expected to be delivered in 2021-2022.

Technology and Innovation

- ▶ In March 2019, MBDA France opened a data center at Plessis-Robinson (92) to develop future missile systems.
- ▶ At the February 2019 Idex show in Abu Dhabi, MBDA and Estonia's Milrem Robotics showcased a new anti-tank unmanned ground vehicle (UGV). The 1 ton robot integrates the Milrem Robotics THeMIS UGV with the MBDA IMPACT (Integrated MMP Precision Attack Combat Turret) system that includes two MMP anti-tank missiles and a self-defence machine gun.



BUSINESS AREAS

Equipment supplier

- ▶ Aircraft braking systems
- ▶ Control subsystems and sensors
- ▶ Polymers and composite structures
- ▶ Avionic systems
- ▶ Defence subsystems
- ▶ Auxiliary Power Units (APU)

GOVERNANCE

Chairman Sir Nigel Rudd
 Chief Executive Officer Tony Wood
 Chief Financial Officer Louisa Burdett

OWNERSHIP STRUCTURE (as of 20.11.2019)

Symbol	MGGT
Listed on	LSE
Market Cap (£m)	4 922

Major shareholders (as of 20.11.2019)

Capital Research & Management Co. (World Investors)	9,53%
T. Rowe Price Associates, Inc. (Investment Management)	4,99%
First Pacific Advisors LLC	4,95%
Harris Associates LP	4,93%
FIL Investment Advisors (UK) Ltd.	4,92%

MAIN JOINT VENTURES AND ASSOCIATES

Name	%	Country
Parkway-HS, LLC	70%	United States
Parkway-Hamilton Sundstrand Mexico S. de R.L. de C.V.*	N/A	Mexico
Meggitt UTC Aerospace Systems, LLC	N/A	United States

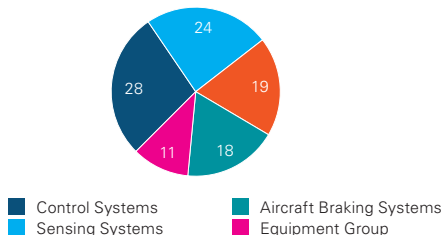
*Owned via Parkway-HS, LLC

KEY FIGURES (Fiscal year ended: December 31st)

€ millions	2015	2016	2017**	2018
Revenue	2 269	2 432	2 274	2 351
Δ (%) [E]*	5,98%	20,95%	0,10%	4,36%
Defence (%)	35%	35%	34%	35%
Export (%)	91%	90%	90%	92%
Operating profit/loss	326	285	311	290
Operating margin (%)	14,37%	11,73%	13,68%	12,33%
Net income	251	209	334	202
Order book	2 221	2 325	2 344	2 500
Employees	11 926	11 210	11 226	11 739

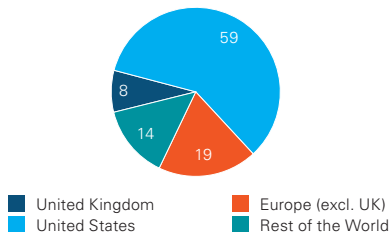
*Variation based on revenue in local currency. See €/£ exchange rates p.7
 **2017 figures restated.

REVENUE BY BUSINESS LINE (%)*



*As of January 1st, 2019, new organisational structure around 4 divisions: Airframe Systems, Engine Systems, Energy & Equipment, and Services & Support.

REVENUE BY REGION (%)



MAIN PROGRAMMES, COOPERATIONS AND EXPORT PARTNERSHIPS

	BAE Systems	Airbus	Lockheed Martin	Boeing	Leonardo	General Dynamics	Dassault Aviation	Textron	Kaman Aerospace	Northrop Grumman	Raytheon
Aircraft braking systems											
Carbon brakes	●	●	●	●	●	●	●	●			
Steel brakes	●	●	●	●	●	●	●	●	●	●	
Control systems	●	●	●	●	●	●	●	●		●	
Polymers and composites											
Composites structures		●	●	●	●	●		●			
Fuel containment	●	●	●	●	●		●			●	
Power conversion											
Power converter systems		●		●							
Control subsystems and sensors											
Ice protection systems		●	●	●	●		●				
Fire detection control unit	●	●	●	●	●	●	●	●		●	
Pressure indicators and gauge		●	●	●	●		●		●	●	
Avionic systems											
integrated Secondary Flight Display (iSFD) instrument			●	●	●		●				
Threat Warning Indicator (TWI)			●	●	●		●				
Defence subsystems											
Aerial target systems (AGTS-36, GT-400) and countermeasures			●	●							●
Automatic ammunition handling	●		●	●		●	●				

STRATEGIC HIGHLIGHTS

Business trends

- ▶ Meggitt is a British equipment manufacturer (braking systems, thermal sensors and components, fire protection and control equipment, etc.) with a particular focus on civil and military aeronautics. The group also operates in the energy and health sectors. In 2018, its total revenue, which it mainly generates in the civil sector, increased by 4.4%, driven by the growth of the Control Systems division.
- ▶ Defence activities, which accounted for 35% of the group's revenue in 2018, reported strong organic growth (+10%) thanks to solid demand for fighter aircraft equipment (particularly for the F-35), as well as contracts to upgrade the fuel tanks of F/A-18 Hornet fighter aircraft and the U.S. Air Force's UH-60 Black Hawk helicopters.
- ▶ To improve operational efficiency, Meggitt reduced the number of its sites from 56 to 45 in 2018, adopting fewer but larger sites. In the United Kingdom, Meggitt plans to close additional sites such as its plants in Birmingham, Coventry and Maidenhead.
- ▶ Meggitt also adopted a new organisational structure, effective January 1, 2019. The group's activities are now organised around 4 divisions (previously 5): Airframe Systems, Engine Systems, Energy & Equipment and Services & Support.

Home market

- ▶ The United Kingdom accounted for only 8% of the group's sales in 2018, but for nearly a quarter of its workforce.
- ▶ In July 2018, Meggitt launched the construction of a "super site" within the Manufacturing Technology Centre of Ansty Park in Coventry (England) in order to centralise various industrial and support functions. The site, which will employ up to 1,000 workers, should be operational by the end of 2019. The project's total cost amounts to £130m (€148m).
- ▶ The group is involved in several British and European defence programmes. For example, Meggitt provides approximately £700,000 (€790,960) worth of equipment (wheels, carbon brakes, landing gear, etc.) for each Eurofighter Typhoon fighter aircraft manufactured.

Export markets

- ▶ The United States remains the group's largest market, with nearly 60% of sales made to U.S. customers. As a partner of major players such as Boeing or Lockheed Martin, Meggitt participates in various military programmes such as the F-35 fighter aircraft, the P-8 Poseidon surveillance aircraft, or the Apache helicopters. In August 2018, the group inaugurated its expanded and reconfigured site in San Diego, which it aims to turn into a centre of excellence for the manufacture of aircraft engine components.
- ▶ In October 2018, Meggitt won a \$323m (€274m) multi-year contract from the U.S. Defence Logistics Agency to supply spare parts and equipment for H-60 Blackhawk helicopters, F-16 Falcon fighter aircraft and CH-47 Chinook helicopters.
- ▶ In 2019, the group signed a \$750m (€847m) contract with U.S. aircraft engine manufacturer Pratt & Whitney (UTC). The 10-year contract covers the supply of components for the F119 and F135 engines that power Lockheed Martin's F-22 and F-35 fighter aircraft.
- ▶ Over the year, Meggitt also won several contracts with General Dynamics Land Systems (GDLS), including a \$37m (€34m) contract in March 2019 to supply cooling and electrical systems for the M1 Abrams tank programme, as well as a multi-million dollar contract in June 2019 to develop an advanced cooling system for the U.S. Army's next-generation battle tanks.

Technology and Innovation

- ▶ Meggitt's R&D expenditure amounted to £138m (€156m) in 2018, representing 6.6% of revenue. This compares with £158m (€180m), or 7.6% of revenue, in 2017.



BUSINESS AREAS

Engine manufacturer, equipment supplier

- ▶ Commercial and military aircraft propulsion systems and subsystems
- ▶ Equipments and components
- ▶ MRO industrial gas turbines

GOVERNANCE

Chairman of the Supervisory Board	Klaus Eberhardt
Chairman and CEO	Reiner Winkler
Chief Program Officer	Michael Schreyögg

OWNERSHIP STRUCTURE (as of 20.11.2019)

Symbol	MTX
Listed on	XETRA
Market Cap (€m)	12 844

Major shareholders (as of 20.11.2019)

Capital Research & Management Co. (World Investors)	12,40%
Threadneedle Asset Management Ltd.	4,57%
Fidelity Management & Research Co.	3,81%
DWS Investment GmbH	3,74%

MAIN JOINT VENTURES AND ASSOCIATES

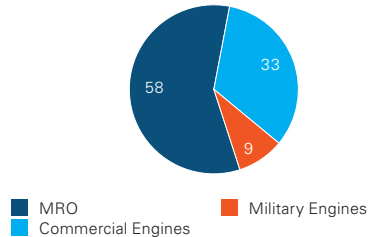
Name	%	Country
EUROJET Turbo GmbH	33%	Germany
EPI Europrop International GmbH	28%	Germany
MTU Turbomeca Rolls-Royce GmbH	33,33%	Germany
MTU Turbomeca Rolls-Royce ITP GmbH	25%	Germany
Turbo Union Ltd	39,98%	United Kingdom

KEY FIGURES (Fiscal year ended: December 31st)

€ millions	2015	2016	2017*	2018
Revenue	4 435	4 733	3 897	4 567
Δ (%)	13,31%	6,72%	-17,66%	17,19%
Defence (%)	11%	11%	11%	9%
Export (%)	89%	89%	88%	89%
Operating profit/loss	386	453	521	620
Operating margin (%)	8,70%	9,57%	13,37%	13,58%
Net income	218	312	355	447
Order book	12 494	14 172	14 893	17 573
Employees	8 334	8 368	8 846	9 731

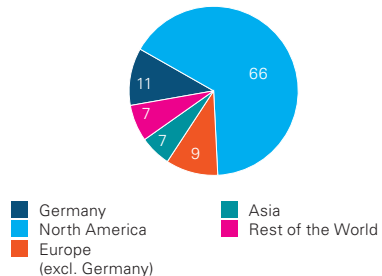
*2017 figures restated.

REVENUE BY BUSINESS LINE (%)*



*Revenue distribution based on total sales excluding eliminations.

REVENUE BY REGION (%)



MTU AERO ENGINES

MAIN PROGRAMMES, COOPERATIONS AND EXPORT PARTNERSHIPS

	Safran	ITP*	Vecor	General Electric	Rolls-Royce	Magellan Aerospace	Pratt & Whitney**	Japanese Aero Engines	Lockheed Martin	Dassault Aviation	GKN Aerospace	Avio Aero***	Airbus
Fighter aircraft engines													
Next European Fighter Engine (NEFE, NGWS programme)	●								●				●
F414 (F/A-18, EA-18G, JAS-39E)			●		●					●			
EJ200 (Eurofighter Typhoon)		●			●								●
F110 (F-15, F-16)	●			●						●		●	
Military transport aircraft engines													
TP400-D6 (A400M)	●	●		●									
IAE V2500 (KC-390)						●	●						
PW2000 (C-17)			●			●							●
Helicopter engines													
T408 (CH-53K)													
MTR390-E/2C (Tiger)	●	●		●									
Gas turbines													
LM2500 series		●		●									
LM5000 and LM6000				●									
ASE series			●										
TF series			●										
MRO and spare parts													
Tyne Mk 21/22 (C-160, Breguet Atlantic)	●			●									
Larzac 04 (Alpha Jet)	●			●									
CF6-50C2 (KC-10)								●					
MTR390 (Tiger)	●			●									
T64 (CH-53G)				●									

*Rolls-Royce group **UTC group ***General Electric group

STRATEGIC HIGHLIGHTS

Business trends

- ▶ MTU Aero Engines is a German manufacturer of propulsion systems and subsystems (including turbines and other engines) for civil and military aircraft and helicopters, as well as industrial gas turbines. It is also one of the leading players in the field of aeronautical maintenance services.
- ▶ MTU Aero Engines' revenue reached €4.6bn in 2018, up 17.2% year-on-year. Sales of commercial aircraft engines (new engines and spare parts, +24.3%) and demand for maintenance services (+22.5%) were the main growth drivers.
- ▶ Sales of military aircraft engines amounted to €431m for the year, pursuing their downward trend (-3.1% during 2018, -11.7% during 2017). The share of this business line in the group's total revenues has halved over the past decade, falling from 18% in 2008 to 8.9% in 2018.
- ▶ The group is currently strengthening its industrial capacities: extension of its Polish plant in Rzeszów, opening of a logistics centre at its German site in Ludwigsfelde, creation of a maintenance centre in Serbia.
- ▶ In October 2018, MTU Aero Engines announced that Reiner Winkler, Chairman and CEO of the group since 2014, will remain in office until September 2024.

Home market

- ▶ MTU Aero Engines generated 10.8% of its revenue in Germany in 2018, a share that has been declining in recent years (-7.8 percentage points compared with 2008).
- ▶ In February 2019, Germany ordered 33 Typhoon fighter aircraft from the Eurofighter GmbH consortium to replace the Tranche 1 Typhoon fighter aircraft delivered between 2003 and 2008. The value of the contract is estimated at €3.3bn. MTU Aero Engines is involved in the production of the Eurojet EJ200 engine powering these aircraft.

Export markets

- ▶ MTU Aero Engines' export revenue jumped 18.8% to €4.1bn in 2018, accounting for nearly 90% of the group's total turnover. The company in fact pursued its international expansion, in particular through the creation of joint ventures (e.g. MTU Maintenance Zhuhai, in partnership with China Southern Air Holding Company, for the Asian market).
- ▶ The group also benefitted from the confirmed sale of 24 Eurofighter Typhoon to Qatar in September 2018, a contract worth €6.8bn. The aircraft are scheduled for delivery at the end of 2022.
- ▶ While the group enjoyed a solid export business, it was, like other German defence manufacturers, constrained by Germany's ban on arms exports to Saudi Arabia, which was extended by 6 months in March 2019 (resulting, for example, in the blocking of a £10bn (€11.7bn) order for 48 Eurofighters).

Technology and Innovation

- ▶ MTU Aero Engines' R&D expenses reached €201.2m in 2018 (up 0.8% from the previous year), of which 88% self-financed expenses. This represented 4.4% of the group's turnover, compared to 5.1% the year before.
- ▶ As part of Europe's Future Combat Air System (FCAS) programme, MTU Aero Engines and Safran in February 2019 entered into a partnership to design the engine for the future European fighter aircraft (Next-Generation Weapon System, NGWS). MTU Aero Engines will be in charge of designing the low and high-pressure compressors and the low-pressure turbine. MTU Aero Engines will act as the main partner of Safran, which will be the programme's prime contractor.



BUSINESS AREAS

Ammunition provider, systems integrator/equipment supplier

- ▶ Ammunition (commercial, small, medium and large calibre)
- ▶ Weapon systems (shoulder fired systems, warheads and fuzes)
- ▶ Explosives and pyrotechnics (hand grenades, initiation systems)
- ▶ Rocket motors (missiles, boosters, hybrid)
- ▶ Demilitarisation services (conventional ammunition)

GOVERNANCE

Chairman

Chief Executive Officer

Acting Chief Financial Officer

D. Schjervén

M. Brandtzæg

L. Furuset

KEY FIGURES (Fiscal year ended: December 31st)

€ millions	2015	2016	2017**	2018
Revenue	423	445	478	513
Δ (%) /NOK/*	1,76%	9,22%	8,00%	10,25%
Defence (%)	80%	80%	80%	80%
Export (%)***	91%	76%	82%	80%
Operating profit/loss	32	41	39	38
Operating margin (%)	7,50%	9,29%	8,22%	7,36%
Net income	24	30	22	25
Order book	534	525	472	584
Employees	2 088	2 102	2 217	2 409

*Variation based on revenue in local currency.

See €/NOK exchange rates p.7.

**2017 figures adjusted.

***As of 2016, domestic market = Scandinavia region.

OWNERSHIP STRUCTURE

Symbol

Listed on

Unlisted group

Market Cap

Major shareholders (as of 20.11.2019)

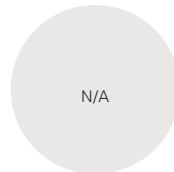
Norwegian State

50%

Patria Oyj

50%

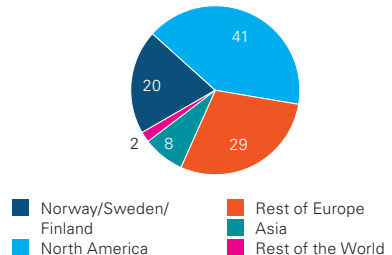
REVENUE BY BUSINESS LINE (%)



MAIN JOINT VENTURES AND ASSOCIATES

Name	%	Country
SN Technologies SA	50%	Switzerland
Komm-In AS	8%	Norway
Sintef Raufoss Manufacturing AS	14%	Norway
Raufoss Holding AS	2,5%	Norway
Nordic Additive Manufacturing	21%	Norway
MAC LLC	N/A	United States

REVENUE BY REGION (%)



MAIN PROGRAMMES, COOPERATIONS AND EXPORT PARTNERSHIPS

	BAE Systems	Forsvarets FI	Raytheon	Saab AB	Cyalume Technologies	PGZ	Thales	Diehl Defence	Kongsberg	MBDA
Ammunition										
Small calibre ammunition (4.6mm - 12.7mm)										
Medium calibre ammunition (12.7mm - 57mm)	●			●	●					
Large calibre ammunition (120mm - 155mm)	●	●	●							
Mortar rounds (60mm, 81mm and 120mm)										
Weapon systems										
Warheads (M282) and fuzes (D652, Jupiter, Mercury, Venus)										
Shoulder fired systems (M72 LAW, BDM, SMAW and SMAW-T)			●							
Explosives and pyrotechnics										
Hand grenades										
Initiation systems										
Hystrix grenades launch system										
Rocket motors										
Rocket motors for missiles (ESSM, IRIS-T SL, IDAS, Penguin, AMRAAM, Sidewinder, NSM)		●					●	●		
Auxiliary boost rocket motors (Exocet MM40, NSM)								●	●	
Booster separation motor and acceleration booster (Ariane 5)										
Hybrid rocket motors			●			●				
Altair air-launch system (demonstrator)										
Demilitarisation services										
Demilitarisation and thermal treatment										●

STRATEGIC HIGHLIGHTS

Business trends

- ▶ Nammo is a Norwegian aerospace and defence company equally controlled by the Norwegian State (50%) and Finnish defence group Patria Oyj (50%). The group is one of the world's leading providers of ammunition and weapon systems, and a major player in the ammunition demilitarisation market. It generates 80% of its turnover in defence, a share that has remained stable in recent years.
- ▶ Nammo's turnover increased again in 2018 (+10%), reaching NOK 4.9bn (€513m). The group's order book also increased strongly (+25% compared to 2017).
- ▶ Against a backdrop of weak prospects in the European ammunition demilitarisation market, Nammo continued its restructuring efforts. The group closed its Pinnow site in Germany and consolidated its defence activities in Sweden. It also reorganised manufacturing activities at its U.S. sites.
- ▶ On the other hand, the group in 2017 announced technology and industrial investments of more than NOK 1bn (€107m) over the five following years. Nammo particularly aims to create a new automated production line for medium-calibre ammunition (20 to 30mm) at its Raufoss site in Norway .
- ▶ In January 2019, the group completed the acquisition of a majority stake in MAC LLC, a U.S. manufacturer of lightweight polymer cartridge cases for small and medium calibre ammunition.
- ▶ Nammo established a 25-year partnership with Boeing to develop a wide range of guided artillery projectiles for the U.S. armed forces and its allies.

Finland, Norway, Sweden

- ▶ Created through the merger of three Scandinavian defence companies, Nammo is still very present on the Scandinavian market, where it generated 20% of its sales in 2018.
- ▶ A key player in the demilitarisation of ammunition in Europe, Nammo is currently involved in the disassembly, recycling and disposal of obsolete ammunition in Sweden and Norway.
- ▶ The group also produces 25mm APEX ammunition for the F-35 fighter aircraft, as part of an agreement with the Norwegian Defence Materiel Agency (NDMA).
- ▶ In June 2019, Nammo won a four-year contract from the Norwegian Defence Logistics Organisation to supply ammunition to the Norwegian Armed Forces, a contract worth around NOK 1.7bn (€174m).

Export markets

- ▶ Nammo generated more than three quarters of its sales in international markets in 2018. North America remains the group's largest export market, accounting for 41% of its total turnover.
- ▶ Since 2017, Nammo is benefiting from a 30-year public-private partnership with the U.S. Navy to provide solid propulsion systems, tactical warheads and ammunition demilitarisation services.
- ▶ In 2018, Nammo signed a \$135m (€113m) contract with the U.S. Army to supply shoulder-fired rocket launchers. The group was also selected by the U.S. Navy and the U.S. Army to supply 30mm ammunition in partnership with General Dynamics.

Technology and Innovation

- ▶ Nammo aims to devote 10% of its annual revenue to R&D activities, which in particular include long-range ammunition, medium-calibre ammunition (30 and 40mm), ammunition for the F-35 and hybrid rocket motors.
- ▶ Since 2015, Nammo has been participating, along with seven other European partners, in the ALTAIR microlauncher project (Air Launch space Transportation using an Automated aircraft and an Innovative Rocket) of the ONERA (France's national aerospace research centre). In 2019, the demonstrator's last flight experiments were conducted in French Guiana.

BUSINESS AREAS

Platform manufacturer and systems integrator

- ▶ Surface ships
- ▶ Submarines (SSN, SSBN, SSK)
- ▶ Underwater weapons
- ▶ Combat systems, navigation systems, naval integration of drones
- ▶ Maintenance, modernisation and associated services for naval bases
- ▶ Marine renewable energies and civil nuclear energy

GOVERNANCE

Chairman and CEO

H. Guillou

General Secretary

J.-Y. Battesti

Executive VP Programs

O. de la Bourdonnaye

OWNERSHIP STRUCTURE

Symbol

Listed on

Unlisted group

Market Cap

Major shareholders (as of 20.11.2019)

French State	62,25%
Thales	35,00%
FCPE Actions Naval Group	1,73%

MAIN JOINT VENTURES AND ASSOCIATES

Name	%	Country
Kership	45%	France
Itaguaí Construções Navais SA (ICN)	41%	Brazil
Boustead DCNS Naval Corporation Sdn Bhd (BDNC)	40%	Malaysia
Technicatome (formerly Areva TA)	20,32%	France
Les Chantiers de l'Atlantique	11,7%	France
DCNS Zamil	55%	Saudi Arabia
Naviris	50%	Italy

KEY FIGURES (Fiscal year ended: December 31st)

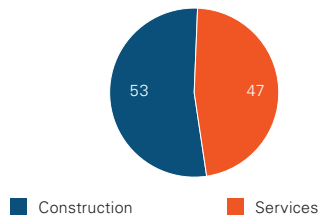
€ millions	2015	2016	2017*	2018
Revenue	3 039	3 191	3 194	3 608
Δ (%)	-0,88%	5,02%	0,09%	12,97%
Defence (%)	~95%	~95%	~95%	~95%
Export (%)	49%	38%	35%	30%
Operating profit/loss**	64	103	98	266
Operating margin (%)	2,11%	3,21%	3,07%	7,37%
Net income***	68	94	93	178
Order book	12 271	11 629	13 773	13 830
Employees	13 878	13 870	14 515	14 860

*2017 figures restated.

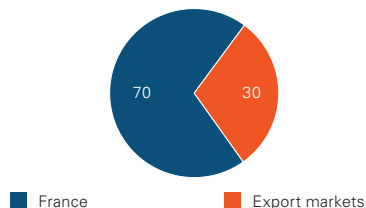
**EBITA (Earnings Before Interest, Taxes and Amortization).

***Net income attributable to shareholders.

REVENUE BY BUSINESS LINE (%)



REVENUE BY REGION (%)



MAIN PROGRAMMES, COOPERATIONS AND EXPORT PARTNERSHIPS

	Thales	Technicatome*	Fincantieri	Chantiers de l'Atlantique**	Leonardo	Mazagon Dock Limited	Odebrecht	Alexandria Shipyards	Boustead Naval Shipyard	Atlas Elektronik***	ASC Pty Ltd	Pirou
Submarines												
Le Triomphant-class ballistic missile nuclear-powered submarine (SSBN)	●	●										
Suffren-class nuclear-powered attack submarine (SSN)		●										
Scorpene-class conventionally-powered attack submarine (SSK)	●				●	●		●				
Attack-class conventionally-powered attack submarine (SSK)										●		
Surface ships												
Mistral-class Landing Helicopter Dock (LHD)				●								
FREMM ASW/FREMM AAW multi-purpose frigates	●		●		●							
OPV, patrol vessels and corvettes (Gowind, OPV 90, MPV80, B2M)	●						●	●				●
FDI / Belharrá-class frigates	●											
Future Logistic Support Ship (BRF, FLOTLOG programme)****	●		●	●								
Underwater weapons												
F21 heavyweight torpedo	●									●		
MU90 lightweight torpedo	●				●							
Systems and equipment												
SUBTICS, SETIS and POLARIS combat management systems	●					●	●	●	●			●
Sylver vertical launching system			●									
MRO and services												
Charles de Gaulle aircraft carrier mid-life upgrade*****	●	●										
Horizon-class frigates modernisation												

*Formerly Areva TA **Formerly STX France ***TKMS, ThyssenKrupp AG group ****Based on Italian Navy's Vulcano-class LSS *****Completed in November 2018

STRATEGIC HIGHLIGHTS

Business trends

- ▶ Naval Group, formerly known as DCNS, is France's leading designer, manufacturer and systems integrator of surface vessels (aircraft carriers, frigates, corvettes, multi-purpose vessels, oil replenishment vessels, etc.) and submarines (nuclear or conventional propulsion). The group is also involved in the production of underwater weapons, maintenance services for military naval vessels, as well as marine renewable energies.
- ▶ The group's turnover reached €3.6bn in 2018, up 13% over a year. Growth was mainly driven by major national programmes (Suffren-class nuclear powered-attack submarines and FREMM frigates) but also by contracts for conventionally-powered submarines in Brazil and Australia.
- ▶ Announced at Euronaval 2018, the alliance between France's Naval Group and Fincantieri (Poseidon project) was formalised in June 2019. The alliance should in particular enable the two groups to carry out common R&D projects and jointly prepare surface vessel bids for binational programmes and export markets. A 50:50 joint venture, called Naviris, was created at the end of the year, with its headquarters in Genoa (Italy) and a site in France (Ollioules).

Home market

- ▶ Naval Group generates about 70% of its sales on its domestic market. The group is the prime contractor for the main construction and modernisation programmes of the French Navy.
- ▶ As part of the FLOTLOG (Logistics Fleet) programme, the Organisation for Joint Armament Co-operation (OCCAR) in January 2019 awarded a €1.7bn contract to Naval Group, Chantiers de l'Atlantique and Thales to build four new Logistic Support Ships (LSS) and provide operational readiness services for six years. The design of the ships will be based on that of the Vulcano-class LSS built by Fincantieri for the Italian Navy. Naval Group will in particular provide the combat system for these vessels.
- ▶ In July 2019, Naval Group delivered the 6th FREMM frigate (Normandie) to the French Navy. The group is meanwhile completing the FREMM-AAW frigate Alsace, the first multi-mission frigate with enhanced anti-aircraft warfare (AAW) capabilities, and is continuing assembly work on the second frigate of the same class (Lorraine). The two ships are scheduled for delivery in 2021 and 2022.
- ▶ A month later, the group launched the Suffren, the first of its latest-generation nuclear-powered attack submarine. This class of submarines (stemming from the Barracuda programme) is intended to replace the Rubis-class submarines, which were commissioned in the 1980s. The first sea trials will start in early 2020.

Export markets

- ▶ With only 30% of its turnover generated from exports in 2018, the group aims to strengthen its international presence. In addition to the alliance concluded with Fincantieri (Poseidon project), Naval Group in December 2018 opened an Egyptian subsidiary, Alexandria Naval for Maintenance and Industry (ANMI), and signed a memorandum of understanding with state-owned defence company Saudi Arabian State Military Industries (SAMI) in early 2019 to create a joint venture for the development and production of warships in the region.
- ▶ In 2018-2019, Naval Group won several export contracts: a €319m contract in Argentina for four Gowind patrol vessels; a €2bn contract for 12 mine-hunting vessels in Belgium and the Netherlands via Belgium Naval & Robotics (Naval Group/ECA Group). Greece also signed a letter of intent for two Belharra frigates.
- ▶ Naval Group signed a strategic partnership agreement with the Australian government to supply 12 Attack-class conventionally-powered submarines, which are based on the Barracuda programme. In March 2019, the company signed a first €361m contract for the design of the future submarines, which will be built by ASC Pty Ltd at the Osborne shipyard in Australia.

Technology and Innovation

- ▶ The group's self-financed R&D expenditure amounted to €82.5m in 2018, representing 2.3% of revenue.



BUSINESS AREAS

Platform manufacturer and systems integrator

- ▶ Military shipbuilding (patrol vessels, corvettes, frigates, Landing Helicopter Dock (LHD) ships, submarines)
- ▶ Commercial shipbuilding
- ▶ Systems and equipment
- ▶ Propulsion systems
- ▶ MRO and modernisation
- ▶ Marine energies

GOVERNANCE

Chairwoman and CEO

S. de Sarriá Sopeña

Chief Financial Officer

J. Bagüés Oliver

OWNERSHIP STRUCTURE

Symbol

Listed on

Unlisted group

Market Cap

Major shareholders (as of 20.11.2019)

Spanish State (via SEPI)

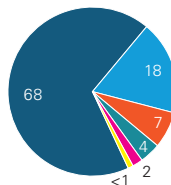
100%

KEY FIGURES (Fiscal year ended: December 31st)

€ millions	2015	2016	2017	2018
Revenue*	705	710	851	1 083
Δ (%)	26,59%	0,71%	19,81%	27,30%
Defence (%)	N/A	N/A	N/A	N/A
Export (%)	58%	41%	35%	38%
Operating profit/loss	-212	-276	-367	-221
Operating margin (%)	-30,03%	-38,90%	-43,08%	-20,41%
Net income	-166	-229	-297	-226
Order book*	1 876	2 163	1 680	4 671
Employees	5 348	5 296	5 172	4 953

*Excluding "Subsidiaries" division.

REVENUE BY BUSINESS LINE (%)*



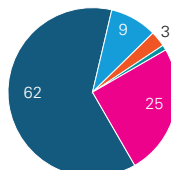
■ Shipbuilding ■ Systems
■ MRO et modernisation ■ Propulsion and energy
■ Engineering ■ Other

*Excluding "Subsidiaries" division.

MAIN JOINT VENTURES AND ASSOCIATES

Name	%	Country
Sociber Ltda.	50%	Chile
Inmize Capital S.L	20%	Spain
SAES Capital	51%	Spain
Surveillance Maritime S.A.	10%	Spain

REVENUE BY REGION (%)



■ Spain ■ Europe (excl. EU)
■ EU (excl. Spain) ■ Rest of the World
■ Americas

MAIN PROGRAMMES, COOPERATIONS AND EXPORT PARTNERSHIPS

	UTC	MTU*	SEDEF	Lockheed Martin	General Dynamics	Indra Sistemas	BAE Systems	Larsen & Toubro	Avio Aero**	ASC Pty Ltd	Elbit Systems	GE Aviation	Raytheon	EXPAL
Submarines														
S-80-class attack submarines	●	●		●	●	●			●					
Frigates and patrol vessels														
Future F110-class frigate					●									
F-100-class frigate (Álvaro de Bazán)				●	●									
F-310-class frigate (Fridtjof Nansen)				●										
Hobart-class Air Warfare Destroyer (AWD)				●	●				●				●	
Avante-class corvette		●												
Buque de Acción Marítima (BAM)-class patrol vessel					●									
LHD and logistics ships														
Juan Carlos I-class LHD			●		●	●	●							
Canberra-class LHD						●								
Supply-class auxiliary oiler replenishment (derived from the Cantabria)														
Systems and equipment														
Dorna fire control system (LCS-class frigates)			●											
SCOMBA naval combat management system (Juan Carlos I-class LHD, BAM-class patrol vessels, F-100-class frigates)			●											
Propulsion systems														
MTU series 396, 956 and 1163 marine engines (under licence)		●												
Weapon systems														
Tizona 30mm turret (VCR 8x8)										●			●	

*Rolls-Royce group **GE Aviation group

STRATEGIC HIGHLIGHTS

Business trends

- ▶ Navantia is a Spanish state-owned shipbuilding company that operates both in the civil and military sectors. Although it generates the majority of its revenue from defence activities, the company has been diversifying its activities in the civil sector, particularly in the field of marine energies.
- ▶ The group's turnover increased for the fourth consecutive year in 2018 (+27.3%), to €1.1bn, partly driven by strong growth in the Shipbuilding division. However, the company continued to report losses, of €221m (equivalent to a net margin of -20.41%), despite a restructuring plan launched in July 2017.
- ▶ Navantia's order book increased from €1.7bn in 2017 to €4.7bn in 2018, in particular thanks to the Spanish Navy's S-80 submarine programme and Saudi Arabia's Avante 2200 corvettes programme.

Home market

- ▶ The group remains very dependent on its domestic market, with nearly two-thirds of its sales made to the Spanish Navy.
- ▶ The first of the four S-80 submarines is now scheduled for delivery in 2022 instead of 2015, a seven-year delay related to major technical difficulties encountered by Navantia during construction. The additional cost of the programme is estimated at between €1.5 to €1.8bn and is weighing on operational performance.
- ▶ In January 2019, the Spanish Navy took delivery of the Furor, the sixth and last BAM-class offshore patrol vessel. A few months later, Navantia won a new contract from the Spanish Ministry of Defence to build five new F110-class frigates to replace the current six Santa Maria-class units. The value of the contract is estimated at €4.33bn.

Export markets

- ▶ 38% of the group's turnover was generated from exports in 2018, a share slightly higher than in 2017 (34%).
- ▶ Navantia won several contracts from Australia in recent years, including for the construction of Canberra-class helicopter carriers, Hobart-class destroyers, as well as logistics support vessels based on the Cantabria-class oil replenisher, making the country a strategic partner for the company. After the launch of HMAS Supply in November 2018, Navantia in August 2019 launched the second of two new logistics vessels for the Australian Navy. Named HMAS Stalwart, it is scheduled to enter service in 2020.
- ▶ In January 2019, Navantia began construction of the first of five Avante 2200 corvettes ordered by Saudi Arabia in 2017 for €1.8bn. The first unit is scheduled to be delivered in 2022.
- ▶ Navantia, Naval Group, the Saab AB-Damen consortium and TKMS are competing on the replacement programme for the Dutch Navy's four Walrus-class submarines. As part of this call for tenders, Navantia is proposing a version of the S-80.
- ▶ In September 2019, Navantia and Britain's BMT Group joined forces to make a proposal for the British Ministry of Defence's Fleet Solid Support (FSS) programme for the supply of three support ships tasked with supplying dry stores (ammunition, food etc.) to new Royal Navy aircraft carriers.

Technology and Innovation

- ▶ At the FEINDEF 2019 defence exhibition in Madrid, Navantia, EXPAL and Elbit Systems unveiled their Tizona 30mm unmanned turret. Developed as part of a cooperation agreement signed at the end of 2018, the turret is intended to equip the Spanish Army's 8x8 Piranha 5 Infantry Fighting Vehicle (IFV), supplied by General Dynamics European Land Systems.



BUSINESS AREAS

Platform manufacturer, systems integrator/
equipment supplier

- ▶ Military aircraft and unmanned aircraft systems
- ▶ Electronic warfare
- ▶ Space systems (equipment, payloads) and C4ISR
- ▶ Weapon and missile systems
- ▶ Cybersecurity
- ▶ Modernisation and logistic services

GOVERNANCE

Chairwoman and CEO
Chief Financial Officer

Kathy J. Warden
K. L. Bedingfield

OWNERSHIP STRUCTURE (as of 20.11.2019)

Symbol	NOC
Listed on	NYSE
Market Cap (\$m)	60 856

Major shareholders (as of 20.11.2019)

Capital Research & Management Co.	18,70%
SSgA Funds Management, Inc.	10,50%
The Vanguard Group, Inc.	7,68%
T. Rowe Price Associates, Inc.	6,15%
BlackRock Fund Advisors	5,37%

MAIN JOINT VENTURES AND ASSOCIATES

Name	%	Country
Longbow LLC	50%	United States
NSTec LLC	N/A	United States
Northrop Grumman Mission Systems Arabia Co. Ltd	N/A	Saudi Arabia
EuroHawk GmbH	50%	Germany

KEY FIGURES (Fiscal year ended: December 31st)

€ millions	2015	2016**	2017**	2018***
Revenue	21 195	22 318	23 012	25 483
Δ (%) / \$*	-1,89%	5,08%	5,25%	15,73%
Defence (%)	75%	82%	86%	85%
Export (%)	14%	13%	13%	15%
Operating profit/loss	2 688	2 960	2 848	3 201
Operating margin (%)	12,68%	13,26%	12,38%	12,56%
Net income	1 909	1 846	2 539	2 734
Order book	32 987	43 016	35 554	46 725
Employees	65 000	67 000	70 000	85 000

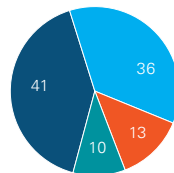
*Variation based on revenue in local currency.

See €/\$ exchange rates p.7

**2016 and 2017 figures restated.

***Including Orbital ATK ("Innovation Systems" new division).

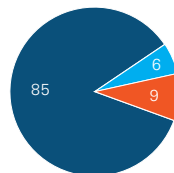
REVENUE BY BUSINESS LINE (%)*



- Aerospace Systems
- Mission Systems
- Innovation Systems (formerly Orbital ATK)
- Technology Services

*Revenue distribution based on total sales excluding eliminations.

REVENUE BY REGION (%)



- United States
- Asia/Pacific
- Other

MAIN PROGRAMMES, COOPERATIONS AND EXPORT PARTNERSHIPS

	Boeing	MBDA	Rolls-Royce	Lockheed Martin	General Electric	Bell Helicopter**	L3Harris Technologies***	Pratt & Whitney***	Collins Aerospace***	Honeywell International	BAE Systems	Raytheon
Unmanned Aircraft Systems (UAS)												
RQ-4 Global Hawk HALE UAS	●		●			●						●
MQ-4C Triton HALE UAS			●			●				●	●	
MQ-8 Fire Scout VTOL UAS			●	●	●				●			
Military aircraft												
E-2C/D Hawkeye surveillance aircraft			●	●		●		●		●	●	●
B-2 Spirit strategic bomber	●			●	●			●				●
B-21 Raider future strategic bomber							●	●		●		
E-8C JSTARS (Joint Surveillance Target Attack Radar Systems) surveillance aircraft	●											
F-35 Lightning II (fuselage, radar, etc.)				●						●		
F/A-18 E/F Super Hornet (fuselage) and EA-18G Growler (electronic warfare suite)	●											
Space systems												
Advanced Extremely High Frequency (AEHF) payloads				●								
Omega future launcher												
C4ISR												
Integrated Air and Missile Defense Battle Command System (IBCS) control-and-command (C2) system	●			●								
Battlefield Airborne Communications Node (BACN) system						●		●				●
Missile systems and artillery systems												
Advanced Anti-Radiation Guided Missiles AARGM and AARGM-ER		●										
Bushmaster cannons (M242, Mk44, M230)										●		

*Textron group **Merger of L3 Technologies and Harris Corporation ***Formerly Rockwell Collins, UTC group

STRATEGIC HIGHLIGHTS

Business trends

- ▶ Northrop Grumman is an American platform manufacturer and systems integrator with a highly diversified portfolio of defence activities, including UAVs, military aircraft, radars and C4ISR, missiles and weapons, and space systems. The group is the world's 3rd-largest defence contractor, with sales of \$30.1bn (€25.5bn) in 2018.
- ▶ Northrop Grumman's revenue increased 15.8% year-on-year in 2018, mainly thanks to the acquisition of Orbital ATK, completed in June 2018, which was renamed Northrop Grumman Innovation Systems and became the group's 4th branch (compared with 3 previously). The group's workforce now stands at 85,000, compared to 70,000 in 2017.
- ▶ As of August 1, 2019, Kathy J. Warden, the group's Chief Executive Officer, was appointed as Chairwoman of the Board of Directors, replacing Wesley Bush.
- ▶ Over the past years, Northrop Grumman has been increasing investments in its production sites. As part of its integration into the group, Orbital ATK is also expanding its industrial capacities, particularly at its Mesa (Arizona) plant, to double the production of Bushmaster guns.

Home market

- ▶ The United States remains Northrop Grumman's most important market, accounting for 85% of the group's revenue in 2018 (including FMS procedures).
- ▶ The group participates in several strategic programmes of the U.S. Army. Among others, it was chosen in 2015 to develop the future USAF strategic bomber, and is also one of the main national players in the military UAV (MQ-4C Triton) and surveillance aircraft (E-2C/D Hawkeye) segments.
- ▶ With the acquisition of Orbital ATK, Northrop Grumman has strengthened its position as a key supplier to the U.S. Department of Defense, in particular by continuing the development of the Omega space launcher, a \$792m (€698m) contract which it signed in October 2018 with the U.S. Air Force.
- ▶ The group won two major contracts with the U.S. Navy in 2019: a \$12.6bn (€11.2bn) contract to provide maintenance, modernisation and related services for its aircraft, as well as a \$3.2bn (€2.8bn) five-year contract to supply 24 E-2D Advanced Hawkeye aircraft.
- ▶ In July 2019, following Boeing's withdrawal, Northrop Grumman became the only contractor to make an offer for the GBSD (Ground Based Strategic Deterrent) intercontinental ballistic missile programme, intended to replace the U.S. Air Force's Minuteman III missiles from 2027 onwards.

Export markets

- ▶ Northrop Grumman has strengthened its international presence in recent years. The group generated 15% of its revenue from exports in 2018, a share that has increased by 7 percentage points since 2011.
- ▶ In February 2018, Northrop Grumman won a \$75m (€63m) contract to supply the Joint Threat Emitter (JTE) system to Saudi Arabia.
- ▶ In late 2018, Japan announced an order for nine E-2D Advanced Hawkeye aircraft, in addition to the four aircraft ordered in 2015, for \$3.1bn (€2.8bn). The Japanese Air Self-Defense Force also ordered three RQ-4 Global Hawk UAVs as part of a FMS (Foreign Military Sales) procedure.
- ▶ After a first order in June 2018, Australia in April 2019 announced its intention to purchase a second MQ-4C Triton UAV. The country could order up to five additional aircraft in a contract potentially worth AUD\$ 6.9bn (€4.5bn), including lifetime maintenance services for the drones.

Technology and Innovation

- ▶ The group's self-financed R&D expenditure reached \$764m (€647m) in 2018.

**BUSINESS AREAS**

Platform manufacturer and systems integrator

- ▶ Space systems (satellites, payloads)
- ▶ Structures, components, propulsion systems

GOVERNANCE

Chairman of the Supervisory Board	Robert Wethmar
Chairman and CEO	Marco R. Fuchs
Chief Financial Officer	Kurt Melching

OWNERSHIP STRUCTURE (as of 20.11.2019)

Symbol	OHB
Listed on	XETRA
Market Cap (€m)	675

Major shareholders (as of 20.11.2019)

Marco R. Fuchs*	34,60%
VOLPAIA Beteiligungs GmbH*	21,40%
Christa Fuchs*	8,03%
Romana Fuchs Mayrhofer*	7,89%

*Fuchs Family.

MAIN JOINT VENTURES AND ASSOCIATES

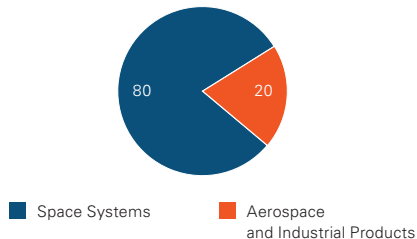
Name	%	Country
Arianespace Participation	8,3%	France
RST Radar Systemtechnik GmbH	22,7%	Germany
Antares Scarl	24%	Italy
COSMOS International Launch Services GmbH	49,9%	Germany
MT Aerospace Holding GmbH	70%	Germany
COSMOS Space Systems AG	66,6%	Germany

KEY FIGURES (Fiscal year ended: December 31st)

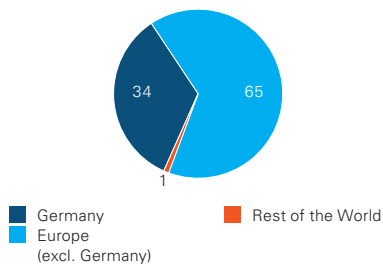
€ millions	2015*	2016	2017	2018
Revenue	730	728	860	1 000
Δ (%)	-5,51%	-0,27%	18,03%	16,37%
Defence (%)	N/A	N/A	N/A	N/A
Export (%)	62%	66%	63%	66%
Operating profit/loss	40	43	44	48
Operating margin (%)	5,51%	5,87%	5,14%	4,78%
Net income**	21	22	23	25
Order book	1 684	1 560	2 439	2 399
Employees	2 056	2 298	2 420	2 769

*Non-consolidated figures until 2015.

**Net income attributable to shareholders.

REVENUE BY BUSINESS LINE (%)*

*Revenue distribution based on total sales excluding eliminations.

REVENUE BY REGION (%)*

*Distribution based on sales by geographical areas. The difference between sales by geographical areas and revenue reached €23.8m in 2018.

MAIN PROGRAMMES, COOPERATIONS AND EXPORT PARTNERSHIPS

	Airbus	Tesat	Spacecom	Avio	Arianespace*	Collins Aerospace**	Surrey Satellite Technology***	Thales Alenia Space	RUAG	Stemme	Boeing	Leonardo
Satellites												
European Data Relay System (EDRS-C)	●	●	●	●								
Electra communications satellite	●				●							
Prisma earth observation satellite				●								●
NAOS (National Advanced Optical System) military reconnaissance satellite				●								
Heinrich Hertz (H2Sat) communications satellite		●		●								
Galileo European global navigation satellite system	●			●	●	●		●				
SARah satellite-based reconnaissance system	●											
SAR-Lupe satellite-based reconnaissance system	●	●						●	●			
Aerial systems												
OMCoSS multi-mission communication & surveillance system										●		
Aerial Reconnaissance Data System (ARDS)	●											
Structures, components, propulsion systems												
Ariane 5 and Ariane 6 structure parts and components	●		●	●								
Antennas and mechatronics (ALMA programme)							●					
Propulsion systems (electrical, cold-gas, monopropellant and bipropellant systems)			●									●
Aircraft components (A400M)	●											

*ArianeGroup

**Formerly Rockwell Collins, UTC group

***Airbus subsidiary

STRATEGIC HIGHLIGHTS

Business trends

- ▶ OHB is Germany's leading aerospace company and the third-largest in Europe, in particular through its two main subsidiaries OHB Systems and MT Aerospace AG. Supported by the German State, which is eager to develop national expertise in the strategic space sector, OHB has seen rapid growth over the past years, reaching a turnover of €1bn in 2018. Revenue grew by 16.4% year-on-year, driven by the ramp-up of the Galileo programme and continued development work for the Ariane 6 programme.
- ▶ Operating income again increased, to €47.8m (+8% year-on-year), but at a slightly slower pace than revenue. As a result, the company's operating margin slightly declined (4.8% in 2018 compared to 5.1% in 2017 and 5.9% in 2016).
- ▶ In June 2019, OHB inaugurated new facilities at its Bremen site (Germany), including clean rooms and laboratories (a new Satellite Test Center, for example). The investment amounted to €6m out of a total budget of €20m earmarked to upgrade the site and enable the group to strengthen its capabilities in the satellite segment. Another clean room of about 1,500 m² is currently under construction and should be operational in the spring of 2020.

Home market

- ▶ OHB generated 34% of its revenue in Germany in 2018, a share that has remained stable over the past years.
- ▶ In early 2018, the group signed a three-year, €13m contract to continue operating the SAR-Lupe satellite-based reconnaissance system (including a constellation of satellites) for the German Army. The programme will later be extended by the SARah satellite-based reconnaissance system.
- ▶ As part of the SARah programme, for which OHB is the prime contractor, the Federal Office of Bundeswehr Equipment, Information Technology and In-Service Support (BAAINBw) awarded a new €91m contract to OHB System AG, a OHB subsidiary, to integrate cybersecurity solutions into the satellite-based reconnaissance system.

Export markets

- ▶ OHB's export sales amounted to €645m in 2018, up 23% over the year, and were almost exclusively related to space programmes. The weight of export turnover has exceeded 60% since 2014 and reached 66% in 2018.
- ▶ In late 2018, OHB Italia won a €168m contract from the Directorate of Defence of Luxembourg's Ministry of Foreign and European Affairs to supply a very high-resolution military observation satellite. The launch of the satellite, called Naos, is scheduled for 2022.
- ▶ The group has a 23% stake (out of the 26% German share) in the Ariane 6 programme, the successor to Ariane 5, whose inaugural flight is scheduled for July 2020. In May 2019, MT Aerospace AG and ArianeGroup signed two contracts with the European Space Agency (ESA) to develop and test the PHOEBUS (Prototype of a Highly Optimised Black Upper Stage) upper deck prototype. MT Aerospace AG is responsible for designing the materials for the prototype's tanks and composite structures.

Technology and Innovation

- ▶ OHB's R&D expenditure reached €25.4m in 2018, representing 2.5% of revenue. More than 90% of the Group's R&D expenses are related to the activities of the Space Systems division.
- ▶ OHB has been multiplying development partnerships. At the beginning of 2019, OHB System AG joined forces with Airbus Defence & Space Netherlands in the field of thermal components for satellites. A few months later, MT Aerospace AG entered into an alliance with Swiss company Oerlikon AM (Additive Manufacturing) to develop 3D printing solutions for the aerospace and defence industries.



BUSINESS AREAS

Platform manufacturer and systems integrator

- ▶ Armoured wheeled vehicles
- ▶ Weapon systems (turrets, mortar systems)
- ▶ C4ISTAR (ELINT systems, IT systems, antennas)
- ▶ Aerostructures
- ▶ MRO, services and logistics support

GOVERNANCE

Chairman	Petri Vihervuori
Chief Executive Officer	Esa Rautalinko
Chief Financial Officer	Ville Jaakonsalo

OWNERSHIP STRUCTURE

Symbol	
Listed on	Unlisted group
Market Cap	

Major shareholders (as of 20.11.2019)

Finnish State	50,1%
Kongsberg Defence & Aerospace AS	49,9%

MAIN JOINT VENTURES AND ASSOCIATES

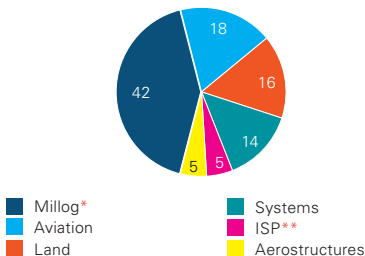
Name	%	Country
Millog Oy	61,8%	Finland
Nammo AS	50%	Norway
Svensk Försvarslogistik AB	50%	Sweden
Silverskin Information Security Oy	25%	Finland
Milrem LCM OÜ	60%	Estonia
AIM Norway	49,9%	Norway

KEY FIGURES (Fiscal year ended: December 31st)

€ millions	2015	2016	2017	2018
Revenue	428	490	467	476
Δ (%)	-10,17%	14,54%	-4,63%	1,90%
Defence (%)	93%	95%	99%	96%
Export (%)	31%	41%	33%	27%
Operating profit/loss	47	75	35	36
Operating margin (%)	10,94%	15,23%	7,41%	7,54%
Net income	38	63	27	26
Order book	1 056	858	692	687
Employees*	2 806	2 765	2 792	2 791

*Average annual workforce.

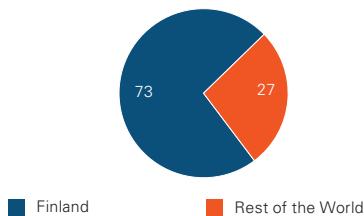
REVENUE BY BUSINESS LINE (%)



*61,8% Patria-owned.

**International Support Partnerships.

REVENUE BY REGION (%)



MAIN PROGRAMMES, COOPERATIONS AND EXPORT PARTNERSHIPS

	Seab AB	Airbus	Rotis	PGZ	Diehl Defence	Kongsberg	Gorenje	Konstrukta Defence	Duro Drakovic	BAE Systems	Oy Western Shipyard Ltd	LMT Defence	Bell Helicopter	Leonardo	NHI
Armoured wheeled vehicles															
8x8 AMV, AMVXP and AMV28A		●	●	●	●	●	●	●	●						
6x6 Patria															
Weapon systems															
NEMO container and NEMO Navy turreted remote-controlled 120mm mortar systems															
Advanced MOrtar System (AMOS) 120mm mortar turret									●						
C4ISTAR															
Advanced Real-time Intelligence System (ARIS) and ARIS ELINT (ARIS-E) systems															
Compact Airborne Networking Data Link (CANDL)															
Aerostructures															
Composite components (A400M, NH90)		●													
MRO, services, logistics support															
Pilot training															
MRO for aircraft (F/A-18 C/D, Hawk Mk51/51A, Fokker F27, C-295M) and helicopters (NH90, Hkp16 Black Hawk, AWW 169)		●							●			●	●	●	
Aircraft engine MRO (F100)															
Hamina-class fast attack craft MRO	●									●					
Military vehicle MRO (XA-180, XA-188, BV206)															
Automatic weapon MRO														●	

STRATEGIC HIGHLIGHTS

Business trends

- ▶ Patria Oyj, 50.1% owned by the Finnish State and 49.9% by Norway's Kongsberg Defence & Aerospace, is a Finnish defence and security company mainly involved in the supply of wheeled armoured vehicles (8x8 AMV vehicles) and weapons systems (mortar turrets); pilot training programmes; as well as the maintenance of land, air and naval platforms. The group is also active in the ammunition segment via Nammo AS, in which it owns a 50% capital stake alongside the Norwegian State. Patria's turnover increased 1.9% to €476m in 2018, with defence activities accounting for 96% of its sales.
- ▶ Patria pursued its internationalisation strategy with the May 2019 acquisition of a minority interest (49.9%) in Aerospace Industrial Maintenance Norway (AIM Norway), a company providing maintenance services for Norwegian Air Force aircraft. The remaining 50.1% are held by Kongsberg Defence & Aerospace. Patria also took control of Belgium Engine Center (BEC), a MRO company that provides maintenance services for Pratt & Whitney's F100 engines (used on F-15 and F-16 fighter aircraft) and which was previously owned by AIM Norway.
- ▶ In July 2019, Esa Rautalinko, previously Managing Director of Örum Group and Chairman of Patria's Board of Directors since November 2018, was appointed Managing Director of the group. Petri Vihervuori replaced him as Chairman of the Board.

Home market

- ▶ With nearly three-quarters of its sales generated in Finland in 2018, Patria remains highly dependent on its domestic market. The group is in particular responsible for the maintenance and modernisation of Hamina-class fast attack craft as well as the supply of land bridging systems (including for four Leopard 2A4 tanks) for the Finnish Defence Forces.
- ▶ In January 2019, the group won a pilot training contract from the Finnish Defence Forces. The contract also covers the maintenance of training aircraft. A few months later, Senop, a Patria subsidiary, signed a letter of intent with the Finnish Defence Forces for the development of laser sights and helmet-mounted image amplifiers.
- ▶ As part of the replacement of the Finnish F/A-18 Hornet fleet (planned retirement by 2030), Patria is preparing to participate in the new Finnish fighter programme (HX Fighter Programme, whose cost is estimated between €7 and €10bn). The Finnish government's decision is expected in 2021.

Export markets

- ▶ Outside its domestic market, the group operates mainly in Europe (Sweden, Norway, Estonia and Poland), the United Arab Emirates, and South Africa.
- ▶ Milrem LCM, 60% owned by Patria and 40% by Estonian company Mootor Grupp, continued to expand its activities in Estonia. The group opened a third site for the maintenance of Estonian Army vehicles.
- ▶ The Swedish Armed Forces exercised an option to continue the maintenance contract for the Hkp16 Black Hawk helicopters, which now runs until 2020. The maintenance contract for the Norwegian Armed forces' fleet of NH90 helicopters was also extended until April 2020.
- ▶ In June 2019, Patria Belgium Engine Center (formerly BEC) won a seven-year contract for the maintenance of the F100 engines (Pratt & Whitney) of the Royal Danish Air Force's (RDAF) F-16 fighter aircraft.
- ▶ In September 2019, the Japanese Army acquired two AMVXP armoured vehicles (the latest version of the 8x8 AMV vehicle, originally developed for the Finnish Army and now used by the Armed Forces of seven countries). After a year-long test period, Patria could be chosen as part of an extended collaboration agreement that includes technology transfer and the creation of an assembly line in Japan.

Technology and Innovation

- ▶ The group's R&D expenditure amounted to €9.1m in 2018, representing 1.9% of 2018 revenue.



BUSINESS AREAS

Platform manufacturer and systems integrator

- ▶ Tracked and wheeled armoured vehicles
- ▶ Weapon systems and artillery systems
- ▶ Missile systems
- ▶ Aircraft systems (attack helicopters, UAS, MRO, modernisation)
- ▶ Defence electronics
- ▶ Military shipbuilding and naval MRO
- ▶ Energy and offshore (platform modules and metallic structures)

GOVERNANCE

Chairman of the Supervisory Board Wojciech Dabrowski
 Chief Executive Officer Witold Slowik

OWNERSHIP STRUCTURE

Symbol
 Listed on Unlisted group
 Market Cap

Major shareholders (as of 20.11.2019)

Polish Department of the Treasury	37,13%
Polski Holding Obronny sp. z.o.o. (formerly Bumar)	33,50%
Agencja Rozwoju Przemyslu S.A.	29,36%

MAIN JOINT VENTURES AND ASSOCIATES

Name	%	Country
Cenzin sp. z.o.o.	~70%	Poland
Nano Carbon sp. z.o.o.	51%	Poland
Huta Stalowa Wola S.A.	85,1%	Poland
Zaklady Mechaniczne Bumar - Labedy S.A.	94,3%	Poland

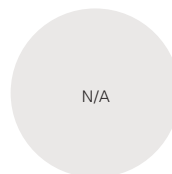
KEY FIGURES (Fiscal year ended: December 31st)

€ millions	2015	2016	2017	2018
Revenue	N/A	N/A	~1 175	1 056
Δ (%)	N/A	N/A	N/A	N/A
Defence (%)	N/A	N/A	N/A	N/A
Export (%)	N/A	N/A	~16%	N/A
Operating profit/loss	N/A	N/A	N/A	N/A
Operating margin (%)	N/A	N/A	N/A	N/A
Net income	N/A	N/A	N/A	N/A
Order book	N/A	N/A	N/A	N/A
Employees	N/A	N/A	~17 500	~ 17 500

REVENUE BY BUSINESS LINE (%)



REVENUE BY REGION (%)



MAIN PROGRAMMES, COOPERATIONS AND EXPORT PARTNERSHIPS

	Patricia	Rheinmetall Defence	Hanwha Land Systems*	Pratt & Whitney**	Lockheed Martin	WB Electronics	Leonardo	OBRUM	Raytheon	Kongsberg	Saab AB
Armoured vehicles											
8x8 KTO Rosomak armoured wheeled vehicle	●										
6x6 KTO Rosomak armoured wheeled vehicle		●					●				
Armoured vehicles modernisation (Leopard 2A4/2A5, BWP-1 PUMA, TUMAK-4, KTO Rosomak)		●									
Weapon systems, artillery systems, missiles											
KRAB 155mm self-propelled tracked howitzer		●									
RAK 120mm self-propelled mortar system					●						
PATRIOT air defence system (including PAC-3 MSE interceptors) (WISLA programme)				●					●		
Naval Strike Missile (NSM)										●	
Mk-82 bomb	●										
Aircraft systems											
Aircraft and turbofan engine MRO and modernisation (Su-22, MiG-29, F-16, F100)			●	●							●
AW249 attack helicopter project						●					
W-3 next-generation military helicopter project						●					
Defence electronics											
TRS-15 mobile medium-range 3D surveillance radar											
Military shipbuilding											
Ratownik-class submarine rescue and salvage vessel											
Kormoran II-class mine-hunting vessel											●
HMS Artemis SIGINT vessel											●

*Hanwha Techwin group

**UTC group

STRATEGIC HIGHLIGHTS

Business trends

- ▶ Polska Grupa Zbrojeniowa (PGZ) is a conglomerate of more than 60 Polish companies operating in the fields of defence, shipbuilding, offshore and new technologies.
- ▶ The group's turnover remained stable at around PLN 4.5bn (around €1.1bn). By 2030, PGZ aims to achieve a turnover of around PLN 12bn (€2.9bn).
- ▶ In August 2019, Wojskowe Zakłady Elektroniczne, a subsidiary of PGZ, inaugurated a new production and maintenance centre for naval strike missiles (NSM). The investment is part of an offset agreement signed with Kongsberg for the supply of NSM missiles to the Polish Army.

Home market

- ▶ The group remains highly dependent on its domestic market. It is the main beneficiary of the extensive programme to modernise the Polish Armed Forces and is an essential partner for foreign players wishing to enter the Polish defence market.
- ▶ In September 2018, PGZ and Boeing signed a letter of intent to collaborate on the latter's Apache AH-64 helicopters, which could be selected by the Polish Ministry of Defence as part of the Kruk programme (acquisition of 32 attack helicopters).
- ▶ PGZ is also collaborating with Leonardo on the new AW249 attack helicopter, initially intended to replace the Italian Army's AW129 and which could also be chosen as part of the Kruk programme.
- ▶ In March 2019, Lockheed Martin signed an offset agreement of PLN 724.8m (€168.4m) with PGZ as part of the Polish Army's Wisla programme (acquisition of Raytheon's Patriot defence system, which integrates Lockheed Martin's PAC-3 MSE interceptor missiles). The agreement in particular includes technology transfers in the field of missile production.
- ▶ In April 2019, the Polish Ministry of Defence signed a €90m offset agreement with Leonardo MW (Leonardo's British subsidiary) for the acquisition of four AW101 helicopters dedicated to anti-submarine warfare. The offset obligations include the installation of a maintenance centre for AW101 helicopters at the site of Military Aviation Works No.1, a subsidiary of PGZ.
- ▶ In August 2019, Huta Stalowa Wola, a PGZ subsidiary, also won a contract worth more than PLN 1bn (€235m) to supply 24 artillery ammunition supply vehicles to the Polish Army.

Export markets

- ▶ South America, the Middle East and Southeast Asia are PGZ's target export markets.
- ▶ In November 2018, PCO, a subsidiary of PGZ, signed a cooperation agreement with Indonesian state-owned defence company PT Pindad. As part of the agreement, PCO and PT Pindad will jointly develop optronic systems for armoured vehicles produced by the Indonesian group.
- ▶ In 2019, PGZ for the first time participated in the IDEX (International Defence Exhibition and Conference) in Abu Dhabi. The group also participated in the SITDEF conference in Peru. PGZ intends to play a key role in the modernisation programmes of the South American Armed Forces.
- ▶ As a subcontractor of Saab AB, Polish Nauta Shiprepair Yard (a subsidiary of PGZ) is involved in the construction of the Swedish Navy's future electronic intelligence vessel, the HMS Artemis (with delivery scheduled for 2020).

Technology and Innovation

- ▶ At the end of 2019, PGZ and PZL Swidnik, the Polish subsidiary of Italian defence group Leonardo, unveiled a next-generation military helicopter concept called W-3, based on the PZL W-3 Sokół model.



BUSINESS AREAS

Engineering support services and systems integrator

- ▶ Aerospace (aerostructures, propulsion)
- ▶ Engineering services and naval systems development/integration
- ▶ Site and test centre management
- ▶ C4ISR
- ▶ Robotics
- ▶ Cybersecurity

GOVERNANCE

Chairman	Neil Johnson
Chief Executive Officer	Steve Wadey
Chief Financial Officer	David Smith

OWNERSHIP STRUCTURE (as of 20.11.2019)

Symbol	QQ
Listed on	London Stock Exchange
Market Cap (£m)	1 910

Major shareholders (as of 20.11.2019)

Schroder Investment Management Ltd.	9,56%
DWS Investment Management Americas, Inc.	5,81%
Silchester International Investors LLP	4,96%
Investec Asset Management Ltd.	4,95%

MAIN JOINT VENTURES AND ASSOCIATES

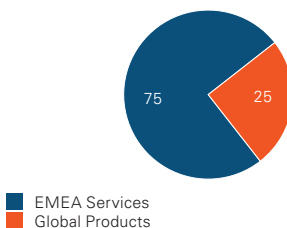
Name	%	Country
Inzpire Group Limited	85%	United Kingdom
BQ Solutions QSTP-LLC	49%	Qatar
Houbara Defence & Security LLC	49%	UAE
QinetiQ Dar Massader QDM Ltd	49%	Saudi Arabia
Redu Space Services S.A	48%	Belgium

KEY FIGURES (Fiscal year ended: March 31st)

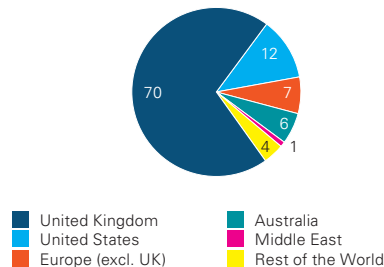
€ millions	2015-16	2016-17	2017-18	2018-19
Revenue	1 032	931	943	1 033
Δ (%) (£)**	-7,79%	3,63%	6,37%	9,38%
Defence (%)	N/A	N/A	N/A	N/A
Export (%)	21%	22%	27%	30%
Operating profit/loss	103	158	160	129
Operating margin (%)	9,96%	16,95%	16,93%	12,49%
Net income**	145	147	156	129
Order book	1 595	2 545	2 292	3 652
Employees	6 207	6 154	6 065	6 061

*Variation based on revenue in local currency. See €/£ exchange rates p.7.
 **Net income attributable to shareholders.

REVENUE BY BUSINESS LINE (%)



REVENUE BY REGION (%)



MAIN PROGRAMMES, COOPERATIONS AND EXPORT PARTNERSHIPS

	BAE Systems	General Atomics	Thales	Lockheed Martin	L3Harris Technologies*	Sierra Nevada Corp.	Leonardo	L3WESCAM	SES	RUAG
Military aircraft										
UCAV Taranis demonstrator	●									
Canadian Armed Forces' Unmanned Aircraft System Service programme**						●	●			
Avionics (Royal Air Force's Eurofighter Typhoon and F-35 fighter aircraft)	●		●							
Naval platform and systems										
Type 26 frigate (Global Combat Ship programme)	●									
Queen-Elizabeth aircraft carriers (electronic systems)	●									
Naval systems integration (C4ISR and combat systems)	●		●	●						
Electromagnetic Aircraft Launch System (EMALS)		●								
Advanced Arrestor Gear (AAG)		●								
Services										
Aeronautics services (engineering, test centre management, training)										
Naval Combat Systems Engineering Course	●		●							
Target systems (Banshee, Rattler)										
C4ISR										
OBSIDIAN counter drone system										
Modular Electronic Warfare System (MEWS)					●					
Space systems										
International Berthing and Docking Mechanism (IBDM)					●					●
Communication satellite systems and maintenance and operation services for ground-based equipment								●		
Robotics										
Reconnaissance, security and counter-IED operations robots (Dragon Runner, TALON, Spartacus, MAARS)										

* Merger of L3 Technologies and Harris Corporation

** Based on Skeldar V-200 UAV (UMS Skeldar, joint venture between Saab AB and UMS Aero)

STRATEGIC HIGHLIGHTS

Business trends

- ▶ QinetiQ, a former research agency of the British Ministry of Defence (MoD) that became a public-private partnership in 2002 and was listed on the stock exchange in 2006, is a British technology company mainly active in the defence and security sectors. The group generates more than 70% of its turnover with the British and U.S. governments. Its turnover increased by 9.4% to £911m (€1.03bn) during fiscal year 2018/2019, driven by its Global Products division.
- ▶ QinetiQ strengthened its position in training solutions for armed forces with the October 2018 acquisition of German airborne training services company EIS Aircraft Operations (renamed QinetiQ Germany) for €53m, as well as the purchase of 85% of UK-based Inzpire Group Ltd for £23m (€26m), with an option to increase its stake to 100% within two years.
- ▶ In October 2019, the group announced the acquisition of Manufacturing Techniques Inc. (MTEQ), an American supplier of sensors for the U.S. Army, for \$105m (€96m). The operation will enable QinetiQ to double its turnover in the United States.
- ▶ In partnership with the Royal Navy, QinetiQ is investing £18m (€20m) at its Portsmouth Technology Park site in the United Kingdom to create a research centre (Centre of Excellence for Maritime Mission Systems).

Home market

- ▶ The British government is the group's main customer. QinetiQ is a partner of BAE Systems on the Queen Elizabeth aircraft carrier programme as well as the Royal Navy's T26 frigates. At the end of 2018, the group joined a consortium led by Cobham for the future ASDOT (Air Support to Defence Operational Training) programme of the British Ministry of Defence. However, the programme was postponed due to the excessive costs of the bids submitted by the four competing groups led by Cobham, Babcock, Thales UK and Leonardo.
- ▶ In April 2019, QinetiQ signed a £1.3bn (€1.5bn) contract with the MoD to upgrade 16 critical defence infrastructures in the United Kingdom until 2028.
- ▶ As part of the MoD's R-GNS (Robust Global Navigation System) programme, QinetiQ is responsible for developing secure satellite receivers by 2022 (a contract worth €67m, or €75m).
- ▶ QinetiQ is involved in the Royal Navy's Operational Assessment of Signatures Informing Susceptibility (OASIS) programme to reduce acoustic and electromagnetic signals from ships and submarines, a contract worth £18.7m (€20.4m). In June 2019, the group also signed a five-year contract with the Royal Navy to develop a training version of its POINTER guidance system.

Export markets

- ▶ QinetiQ generated 30% of its turnover from exports in 2018/2019 (up 9 percentage points in three years), a share that the group aims to raise to 50%.
- ▶ In the United States, the group's second-largest market, the QinetiQ North America subsidiary was chosen by the U.S. Army to provide small ground robots (\$164m, or €126m, over seven years) and support services for TALON robots until 2023 (\$90m, or €79m).
- ▶ In partnership with Canadian UAVs, Leonardo, UMS SKELDAR (a joint venture between Saab AB and UMS AERO) and L3 WESCAM, QinetiQ was awarded a CAD\$ 51m (€34m) contract to supply the Canadian Armed Forces' new surveillance drones, which will be based on the UMS SKELDAR V-200 UAVs.
- ▶ In early 2019, the group opened an office in Kuala Lumpur (Malaysia) to strengthen its presence in Asia.

Technology and Innovation

- ▶ QinetiQ is leading a three-year research project (with a budget of £3.2m, or €3.6m) to develop electric propulsion systems for future British combat vehicles.



BUSINESS AREAS

Systems integrator/equipment supplier

- ▶ Missile systems, air and maritime defence systems
- ▶ Unmanned systems
- ▶ C4ISR
- ▶ Weapon systems and artillery systems (land and naval)
- ▶ Defence electronics (countermeasures, protection systems)
- ▶ Space (microsatellites, propulsion systems, structures)

GOVERNANCE

Chairman

Uzi Landau

Chief Executive Officer

Yoav Har-Even

Chief Financial Officer

David Vaish

OWNERSHIP STRUCTURE

Symbol

Listed on

Unlisted group

Market Cap

Major shareholders (as of 20.11.2019)

Israeli State

100%

MAIN JOINT VENTURES AND ASSOCIATES

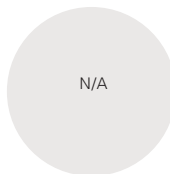
Name	%	Country
Shilat Optronics Ltd	50%	Israel
Opgal Optronic Industries Ltd	49,9%	Israel
GESPI Defense Systems	40%	Brazil
EuroSpike GmbH	20%	Germany
Controp Precision Technologies Ltd	50%	Israel
Kalyani Rafael Advanced Systems Pvt Ltd (KRAS)	49%	India
Varley Rafael Australia (VRA)	N/A	Australia
Astra Rafael Comsys Pvt Ltd	N/A	India

KEY FIGURES (Fiscal year ended: December 31st)

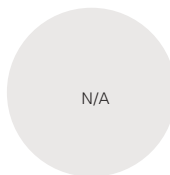
€ millions	2015	2016	2017	2018
Revenue	1 819	1 834	1 999	2 195
Δ (%)/(\$)*	2,96%	0,59%	11,23%	14,79%
Defence (%)	100%	100%	100%	100%
Export (%)	61%	45%	46%	45%
Operating profit/loss	112	103	N/A	N/A
Operating margin (%)	6,13%	5,59%	N/A	N/A
Net income	106	111	110	113
Order book	4 555	5 366	5 753	5 921
Employees	6 926	7 151	~7 500	~7 500

*Variation établie sur la base du CA en dollar américain.
See €/€ exchange rates p. 7.

REVENUE BY BUSINESS LINE (%)



REVENUE BY REGION (%)



RAFAEL ADVANCED DEFENSE SYSTEMS

MAIN PROGRAMMES, COOPERATIONS AND EXPORT PARTNERSHIPS

	IAI	Lockheed Martin	BAE Systems	Northrop Grumman	Raytheon	Diehl Defence	Rheinmetall Defence	Astra Microwave Products	Kalyani Strategic Systems	General Dynamics	Elbit Systems	Leonardo
Missile systems and air defence systems												
David's Sling long-range air defence system and Stunner interceptor					●							
Iron Dome short-range air defence system	●				●							
Tamir interceptor (Iron Dome, C-Dome)					●							
SPYDER SR and SPYDER MR-ADS air defence systems	●											
Barak 1 and Barak 8 surface-to-air defence systems	●							●				
C-Dome and MIC4AD defence systems												
Typhoon stabilized naval remotely-controlled weapon station family			●									
Spike family of missile systems (Spike ER/LR and ER2/LR2 anti-tank missile systems, Spike NLOS multi-purpose missile system)						●	●		●			
SPICE 250/1000/2000 guidance kit		●				●						
Trophy Active Protection System (APS)	●								●		●	
Drone Dome anti-UAV system												
Defence electronics												
Electro-optical seekers											●	
LITENING advanced targeting pod				●								
Unmanned system												
Protector USV		●	●									
Weapon systems and artillery systems												
SAMSON remote control weapon station family									●			
Communication systems												
BNET software defined radio family								●				

STRATEGIC HIGHLIGHTS

Business trends

- ▶ Rafael is an Israeli defence technology company 100% owned by the Israeli State, and one of Israel's leading defence contractors alongside Elbit Systems and Israel Aerospace Industries (IAI). The group mainly provides air defence systems, defence electronics solutions, communication solutions, UAVs and weapons, and artillery systems. It generates 100% of its sales in the military sector.
- ▶ Rafael's turnover increased 14.8% to \$2.6bn (€2.2bn) in 2018.
- ▶ In September 2019, Rafael and Israeli businessman Avichai Stolero jointly completed the 50:50 acquisition of Israeli drone manufacturer Aeronautics Ltd. The acquisition is part of Rafael's diversification strategy, which the group has been pursuing for several years.

Home market

- ▶ In 2018, Rafael generated a little more than half of its turnover (55%) on its domestic market. A key partner of the Israeli Army, the group provides the Iron Dome anti-missile system and the TROPHY active protection system for the Israel Defense Forces' Merkava MK IV tanks.
- ▶ In early 2018, Rafael was selected by the Israeli Army to supply new shoulder-fired missile launchers, which had been under development for two years in order to reduce their weight by 40%.

Export markets

- ▶ Asia, Europe, the Americas and Australia are the group's main export markets. Rafael generated about 45% of its sales in these markets in 2018.
- ▶ In May 2019, Rafael partnered with Lockheed Martin to develop, manufacture and maintain its SPICE air-to-surface guidance kits for the U.S. market. A month later, the group teamed with Britain's Cobham to market its I-Derby missiles in combination with Cobham's Fox-10 launchers.
- ▶ In June 2019, Eurospike GmbH, a joint venture between Rafael, Diehl Defence and Rheinmetall Defence, signed a €40m contract with Estonia to supply Spike LR anti-tank missiles, making Estonia the 32nd customer country of the Spike missile.
- ▶ India is a key target market for Rafael, which has been investing in the country for several years. In early 2019, Astra Rafael Comsys (ARC), a joint venture between Rafael and India's Astra Microwave Products, won its first contract to supply BNET software radios (\$30m, or €26.8m). A few months later, a \$100m contract was awarded to the Kalyani Rafael Advanced Systems joint venture (KRAS, 51% owned by Kalyani Strategic Systems and 49% by Rafael) to supply 1,000 Barak 8 MR-SAM missiles to Indian ammunition and missile systems manufacturer Bharat Dynamics, which will be in charge of their integration. Rafael's offer to supply Spike missiles, on the other hand, was once again rejected by the Indian government (a contract estimated at \$500m, or €446m).
- ▶ In October 2019, Rafael and its partner Leonardo DRS (Leonardo's U.S. subsidiary) delivered the first TROPHY active protection system to the U.S. Army. Developed by Rafael and Elta Systems (a subsidiary of IAI), the TROPHY system, which is produced in Israel by Rafael and in the United States by Leonardo DRS, will equip the U.S. Army's Abrams tanks under a contract worth approximately \$500m (€446m). In 2019, the U.S. Army also acquired two Iron Dome anti-missile systems jointly developed by Rafael and Raytheon.

Technology and Innovation

- ▶ The group's R&D expenses remained stable at 8% of sales in 2018.
- ▶ In June 2019, the group unveiled a new artificial intelligence technology integrated into the SPICE-250 guidance kit, which allows for automatic target recognition. At the Aero India 2019 exhibition, Rafael also unveiled Rocks, a new long-range air-to-surface missile.



BUSINESS AREAS

Missiles producer, systems integrator/equipment supplier

- ▶ Missile systems
- ▶ Integrated defence systems (radar systems, electronic suites, air defence)
- ▶ C5ISR systems
- ▶ Cybersecurity
- ▶ Space and airborne systems
- ▶ Training and support services

GOVERNANCE

Chairman and CEO	Thomas A. Kennedy
VP Integrated Defense Systems	Ralph Acaba
VP Space & Airborne Systems	Roy Azevedo

OWNERSHIP STRUCTURE (as of 20.11.2019)

Symbol	RTN
Listed on	NYSE
Market Cap (\$m)	61 523

Major shareholders (as of 20.11.2019)

The Vanguard Group, Inc.	8,19%
Capital Research & Management Co.	5,46%
SSgA Funds Management, Inc.	4,19%
BlackRock Fund Advisors	2,59%
Copeland Capital Management LLC	2,56%

MAIN JOINT VENTURES AND ASSOCIATES

Name	%	Country
NetFires LLC	50%	United States
Forcepoint LLC	88,5%	United States
Raytheon-Lockheed Martin Javelin JV	50%	United States
TRS AMDC2	50%	France
RGNNext	50%	United States

KEY FIGURES (Fiscal year ended: December 31st)

€ millions	2015**	2016**	2017	2018
Revenue	21 010	21 792	22 432	22 911
Δ (%) / (\$) *	2,17%	3,44%	5,07%	6,75%
Defence (%)	95%	95%	96%	95%
Export (%)	31%	32%	32%	30%
Operating profit/loss	3 352	3 519	3 744	3 843
Operating margin (%)	15,96%	16,15%	16,69%	16,77%
Net income***	1 901	2 027	1 791	2 463
Order book	31 073	34 828	31 868	37 048
Employees	61 000	63 000	64 000	67 000

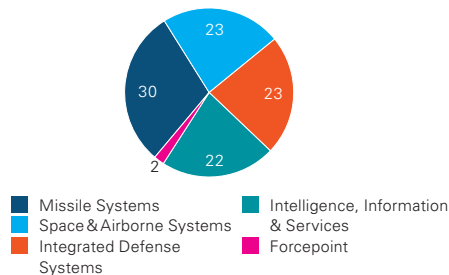
*Variation based on revenue in local currency.

See €/€ exchange rates p.7

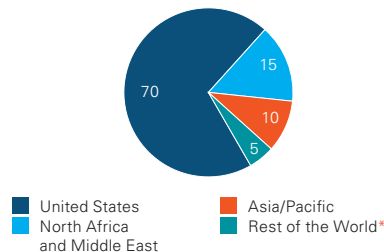
**2015 and 2016 figures restated.

***Net income attributable to shareholders.

REVENUE BY BUSINESS LINE (%)



REVENUE BY REGION (%)



*Mainly Europe.

MAIN PROGRAMMES, COOPERATIONS AND EXPORT PARTNERSHIPS

	Rafael	Nammo	L3Harris Technologies*	Northrop Grumman	Hill**	BAE Systems	General Dynamics	Lockheed Martin	Kongsberg	Diehl Defence	MBDA	Thales	M/HI
Integrated defence systems													
AMDR AESA naval radar (AEGIS)													
AN/TPY-2 ground-based surveillance radar (THAAD)													
PATRIOT missile defence system (integrator)							●						●
Iron Dome air defence system and Stunner interceptor (David's Sling)	●												
Norwegian Advanced SAM System (NASAMS)								●					
DDG-1000 Zumwalt-class (prime mission systems equipment integrator for all electronic and combat systems)			●	●	●	●	●						
Weapon systems													
NSM / JSM anti-ship missiles								●					
FMG-148 JAVELIN anti-tank missile			●				●						
AIM-9 Sidewinder air-to-air missiles family	●												●
SM-2, SM-3, SM-6 interceptors family													
AIM-120 AMRAAM air-to-air missile	●	●	●			●							
Rolling Airframe Missile (RAM) Block 2A								●	●				
TOMAHAWK cruise missile													
TOW anti-tank missile												●	
GBU-53/B Stormbreaker guided glide bomb													
EXCALIBUR artillery projectile	●					●							
Aerospace systems													
Enhanced Integrator Sensor Suite (EISS) of the Global Hawk HALE UAS		●	●										
Next Generation Jammer Mid-Band (NGJ-MB) advanced electronic attack system													

*Merger of L3 Technologies and Harris Corporation **Huntington Ingalls Industries

STRATEGIC HIGHLIGHTS

Business trends

- ▶ Raytheon is an American defence contractor specialised in missile systems and military electronics. It is the world's fourth-largest arms manufacturer by sales, with total revenue of \$27.1bn (€22.9bn) in 2018, up 6.7% year-on-year.
- ▶ The group generates 95% of its revenue from defence activities, a share that has remained relatively stable over the past years. Its four main divisions (Integrated Defense Systems; Intelligence, Information and Services; Missile Systems; Space and Airborne Systems) generate almost all of their sales in the military sector.
- ▶ In June 2019, Raytheon and United Technologies Corporation (UTC) announced a plan for a merger of equals. The agreement, which remains subject to approval by competition authorities, should be completed during the first half of 2020. UTC's Otis (elevators) and Carrier (air conditioning and refrigeration equipment) divisions are expected to be separated as part of the merger process. The new entity, named Raytheon Technologies Corporation, 57% owned by UTC and 43% by Raytheon, is expected to generate revenues of approximately \$74bn (€62.7bn), over half of which from defence activities.

Home market

- ▶ Raytheon generates about 70% of its turnover on the American market. The group is a preferred partner of the U.S. Department of Defense, of which it is the third-largest supplier, behind Lockheed Martin and Boeing.
- ▶ In June 2018, Raytheon was among the players chosen by the U.S. Army Contracting Command (ACC) for the Enterprise Training Services Contract (ETSC), a 5-year, \$2.4bn (€2.1bn) programme to provide training services to the U.S. Army.
- ▶ In February 2019, Raytheon signed a 5-year, \$406m (€358m) contract with the U.S. Army to supply ARC-231A radios for several helicopter types, including the Sikorsky UH-60 Black Hawk (Lockheed Martin), the Eurocopter UH-72 Lakota (Airbus Helicopters) and the AH-64 Apache (Boeing).
- ▶ Raytheon and Germany's Rheinmetall Defence, which have been partners since late 2018 to supply the Lynx armoured fighting vehicle to the U.S. Armed Forces, in August 2019 joined forces with U.S.-based Pratt & Miller Defence as part of the U.S. Army's programme to replace the Bradley infantry fighting vehicle with an Optionally Manned Fighting Vehicle (OMFV).

Export markets

- ▶ The share of export sales (including through FMS procedures) reached 30% in 2018, slightly down compared to 2017, but still significantly higher than in 2010 (+7 percentage points over the period). The Integrated Defense Systems division has around 50 foreign customers.
- ▶ In December 2018, the British Ministry of Defence awarded Raytheon UK a £250m (€282m) contract for support services to the Royal Air Force's fleet of Shadow surveillance aircraft. Raytheon's local subsidiary will also be in charge of upgrading the aircraft fleet to its Mk2 version.
- ▶ Raytheon signed two contracts with Qatar in July 2019, for a total amount of \$2.2bn (€2bn), to supply its Advanced Medium-Range Air-to-Air Missile (AMRAAM) system, the upgraded AMRAAM-ER (Extended Range) system, as well as additional Patriot surface-to-air missile systems.
- ▶ In August 2019, Bahrain officially became the 17th customer country of the Patriot air defence system. The \$2.5bn (€2.2bn) contract, approved by the U.S. government via a FMS procedure, includes the sale of 60 Patriot PAC-3 missiles, 36 MIM-104E Patriot GEM-T (Guidance Enhanced Missiles), nine M903 launching stations and two AN/MPQ-65 radars.

Technology and Innovation

- ▶ Raytheon's self-financed R&D expenses amounted to \$841m (€712mn) in 2018, up 20.1% over the year.



BUSINESS AREAS

Platform manufacturer and systems integrator/
equipment supplier

Defence division of German Rheinmetall AG

- ▶ Armoured vehicles
- ▶ Turret systems and weapon systems
- ▶ Air defence systems
- ▶ Ammunition
- ▶ Defence electronics and C4ISR
- ▶ Simulation and training solutions

GOVERNANCE

Chairman and CEO	Armin Papperger
Head of Vehicle Systems	Ben Hudson
Head of Weapon & Ammunition	Alexander Sagel

OWNERSHIP STRUCTURE

Symbol	
Listed on	Unlisted division
Market Cap	

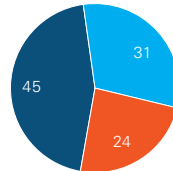
Major shareholders (as of 20.11.2019)

Rheinmetall AG	100%
----------------	------

KEY FIGURES (Fiscal year ended: December 31st)

€ millions	2015	2016	2017	2018
Revenue	2 591	2 946	3 036	3 221
Δ (%)	15,67%	13,70%	3,05%	6,09%
Defence (%)	100%	100%	100%	100%
Export (%)	68%	73%	71%	65%
Operating profit/loss	90	147	174	254
Operating margin (%)	3,47%	4,99%	5,73%	7,89%
Net income	32	74	100	N/A
Order book	6 422	6 656	6 416	8 577
Employees	9 581	10 002	10 251	10 948

REVENUE BY BUSINESS LINE (%)*



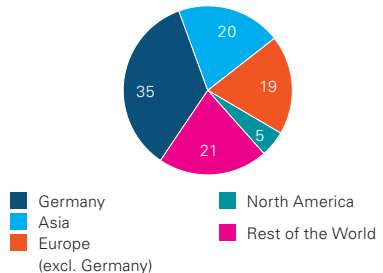
■ Vehicle Systems
 ■ Weapon & Ammunition
 ■ Electronic Solutions

*Revenue distribution based on total sales excluding eliminations.

MAIN JOINT VENTURES AND ASSOCIATES

Name	%	Country
ARTEC GmbH	64%	Germany
Rheinmetall BAE Systems Land	55%	United Kingdom
Rheinmetall MAN Military Vehicles GmbH	51%	Germany
Projekt System & Management GmbH	50%	Germany
EuroSpike GmbH	40%	Germany

REVENUE BY REGION (%)



RHEINMETALL DEFENCE

MAIN PROGRAMMES, COOPERATIONS AND EXPORT PARTNERSHIPS

	KMW*	Nexter*	MAN	Raytheon	General Dynamics	Supacat**	Supashock	NIOA	UAC	Eurofighter GmbH	Thales	NHIndustries	Airbus
Armoured vehicles													
8x8 Boxer infantry fighting vehicle	●	●			●	●							
Fuchs/Fox armoured personnel carrier													
4x4 AMPV light armoured vehicle	●												
Main Ground Combat System (MGCS) project	●	●											
Lynx infantry fighting vehicle				●									
Puma infantry fighting vehicle	●												
HX and SX high mobility logistic vehicles			●			●							
Turret systems and weapon systems													
PzH 2000 155mm self-propelled howitzer	●												
L44 and L55 120mm tank guns (Leopard 2, M1 Abrams)	●				●								
LANCE and LANCE RC turret systems													
Ammunition													
Large-calibre (120mm, 155mm) and medium-calibre (20mm, 25mm, 27mm and 30mm) artillery ammunition													
Air defence systems													
Oerlikon Skyshield / MANTIS short range ground-based air defence system													
Simulation and training solutions													
Flight simulators (MiG-29K, Eurofighter Typhoon, NH90, A400M)									●	●	●	●	●
Future soldier systems													
Gladius / Argus soldier systems													

*KNDS group **SC Group

STRATEGIC HIGHLIGHTS

Business trends

- ▶ Rheinmetall AG (€6.1bn in revenue in 2018) is a German industrial conglomerate specialised in defence and automotive equipment through its two divisions Rheinmetall Defence and Rheinmetall Automotive.
- ▶ Rheinmetall Defence's turnover reached €3.2bn in 2018, up 6.1% year-on-year. Growth was driven by the Vehicle Systems (+5.9%) and Electronic Solutions (+21.4%) activities.
- ▶ In November 2018, Rheinmetall Defence announced it was in talks to acquire German defence company Krauss-Maffei Wegmann GmbH & Co., which owns 50% of KNDS (a joint venture with France's Nexter), in view of merging its own defence assets with KNDS. To succeed, the transaction would require the agreement of the French government, which owns the 50% share in KNDS through state-owned Nexter and is keen to maintain a balance between the French and the German part of KNDS.
- ▶ In January 2019, Rheinmetall AG acquired 55% of BAE Systems' Land UK tank and combat vehicle division for €29m (€33m) in view of creating a joint venture named Rheinmetall BAE Systems Land (RBSL). BAE Systems' land business in the U.S. is not affected by the agreement. The merger allows ARTEC GmbH, a joint venture between Rheinmetall Defence and KMW (KNDS) to be selected for the Mechanised Infantry Vehicle (MIV) programme involving the supply of 500 vehicles, most of which will be produced in the United Kingdom.

Home market

- ▶ Germany is an important market for Rheinmetall Defence, which generated 35% of its turnover in the country in 2018 (compared to 29% in 2017). The planned increase in Germany's defence budget (€44.9bn in 2020 and over €48bn in 2023) offers opportunities for the Rheinmetall AG division.
- ▶ Rheinmetall Defence has partnered with Raytheon to provide the Patriot system as part of the German Army's TLVS programme. Their offer is in competition with Lockheed Martin's, which has partnered with MBDA Deutschland and Diehl Defence. The contract might be awarded in 2020.
- ▶ Rheinmetall Defence signed several contracts with the German Army in 2019, including a €92m contract in June 2019 to supply 252 high mobility military trucks of the HX range, and a €470m contract in July 2019 to upgrade 41 Puma armoured infantry fighting vehicles (IFV), among others.

Export markets

- ▶ Rheinmetall Defence has a strong international presence (65% of revenue in 2018). The division intends to strengthen its international presence, in particular in Eastern Europe, the Middle East / North Africa region, Asia and Australia.
- ▶ During the summer of 2018, Rheinmetall Defence won two contracts with the Australian Army: a €2.1bn contract to supply 211 Boxer armoured fighting vehicles to the ARTEC GmbH consortium (in partnership with KMW) by 2026 (LAND 400 phase 2 programme), and a €890m contract to supply 1,044 logistics trucks by 2024 (LAND 121 phase 5B programme).
- ▶ Because of their failure to deliver their prototype of the Lynx KF41 armoured fighting vehicle by October 1, 2019, Rheinmetall Defence and Raytheon (partners in the programme since October 2018) were excluded from the call for tenders for the future OMFV (Optionally Manned Fighting Vehicle) of the U.S. Army's Next-Generation Combat Vehicle (NGCV) programme (replacement of the Bradley armoured infantry fighting vehicles).

Technology and Innovation

- ▶ R&D expenditure increased by 31.2% in 2018, reaching €143m (4.4% of total revenue).
- ▶ A contract for a system architecture study of the future French-German Main Ground Combat System (MGCS) could be awarded in early 2020 to the three contractors involved in the programme (Rheinmetall Defence, KMW and Nexter).



BUSINESS AREAS

Systems integrator/equipment supplier

- ▶ Test and measurement systems
- ▶ Broadcast solutions
- ▶ Communication systems for ground, air and naval forces
- ▶ ISR and defence electronics
- ▶ Cybersecurity

GOVERNANCE

Chairman and CEO Christian Leicher
 President and Chief Operating Officer Peter Riedel

KEY FIGURES (Fiscal year ended: June 30th)

€ millions	2014-15	2015-16	2016-17	2017-18
Revenue	~1 850	~1 920	~1 950	~2 040
Δ (%)	N/A	N/A	N/A	N/A
Defence (%)	N/A	N/A	N/A	N/A
Export (%)	N/A	N/A	N/A	~85%
Operating profit/loss	N/A	N/A	N/A	N/A
Operating margin (%)	N/A	N/A	N/A	N/A
Net income	N/A	N/A	N/A	N/A
Order book	N/A	N/A	N/A	N/A
Employees	9 900	10 000	10 500	11 500

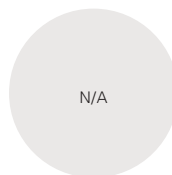
OWNERSHIP STRUCTURE

Symbol Listed on Unlisted group
 Market Cap

Major shareholders (as of 20.11.2019)

Family shareholders | N/A

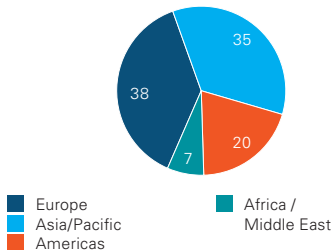
REVENUE BY BUSINESS LINE (%)



MAIN JOINT VENTURES AND ASSOCIATES

Name	%	Country
RRS-MITCOS	25,1%	Germany
DICOM	N/A	Czech Republic

REVENUE BY REGION (%)



MAIN PROGRAMMES, COOPERATIONS AND EXPORT PARTNERSHIPS

	Diehl Defence	ESG	MESIT	Hensoldt	Airbus	Naval Group	Rheinmetall Defence
Software defined radios							
German Armed Forces' joint radio system (SVFuA programme)							●
SOVERON VR tactical radio for vehicular and semi-mobile communications			●				
SOVERON AR software defined airborne radio			●				
R&S SDAR software defined airborne radio (CH-47)							
R&S M3SR Series4100 radio family for stationary and shipborne communications							
R&S M3AR VHF/UHF transceiver family for airborne communications (Eurofighter, NH90)							
R&S MR6000A transceiver (A400M)							
Shipboard communication systems							
NAVICs system for internal and external communications (Type 26, F125, K130)							
RIFAN 2 IP network for the French Navy					●	●	
ISR and defence electronics							
R&S Wideband Processing Unit (WPU) 2000 next-generation ELINT processor							
R&S RAMON COMINT/CESM softwares							
NGWS' defence electronics (FCAS programme)	●	●	●				
Encryption system							
ELCRODAT 4-2 encryption system							
Anti-UAV system							
R&S ARDRONIS solution for automated radio-controlled drone protection (part of the GUARDION anti-UAV system)	●	●					
Message handling systems							
R&S STANAG 5066 and R&S MMHS message handling systems							

STRATEGIC HIGHLIGHTS

Business trends

- ▶ Rohde & Schwarz, a German family-owned group, is a leading provider of test and measurement, broadcasting and secure communications solutions. In the defence sector, the group offers communication systems, including software radios, ISR systems and defence electronics systems. Its turnover reached €2.04bn for the 2017/2018 fiscal year.
- ▶ In 2018, Rohde & Schwarz and Rheinmetall formed a joint venture, RRS-MITCOS (Rheinmetall - Rohde & Schwarz - Military IT and Communications Solutions), which will participate in the tender for the Bundeswehr's Digitisation of Land-based Operations (D-LBO) programme. Rheinmetall owns 74.9% of the joint venture, Rohde & Schwarz the remaining 25.1%.
- ▶ A year later, Rohde & Schwarz joined forces with Czech electronics company MESIT to create the DICOM joint venture (majority-owned by MESIT), which initially will be dedicated to R&D in the field of SOVERON software radios.

Home market

- ▶ Rohde & Schwarz is participating, as an electronic equipment manufacturer, in various programmes of the German Army (renewal of the Sea KING Mk.41s helicopter fleet, D-LBO programme, etc.). It has also teamed with Hensoldt, Diehl Defence and ESG within the German FCMS (Future Combat Mission System) consortium to participate on the defence electronics part of the European Next-Generation Weapon System (NGWS) as part of the Future Combat Air System (FCAS) programme.
- ▶ The group is responsible for the supply of software radios for the 18 Airbus NH90 Sea LION helicopters of the German Navy, which will replace the ageing fleet of Sea KING Mk.41s helicopters. The first units are expected to be delivered by the end of 2019.
- ▶ As part of the D-LBO programme, Rohde & Schwarz is providing the German Armed Forces' joint radio system (also known as SVFuA) for the Bundeswehr's PUMA and BOXER armoured vehicles. As a subcontractor of Rheinmetall Electronics, the group also supplies the latest generation of software radios for PUMA vehicles.

Export markets

- ▶ In April 2018, Rohde & Schwarz was selected by Boeing to equip the latter's CH-47 Chinook helicopters with its latest-generation software radios (R&S SDAR).
- ▶ In March 2019, the French defence procurement agency (DGA) awarded the Industry Grouping led by Airbus and composed of Naval Group and Rohde & Schwarz the €150m RIFAN 2.1 contract for the maintenance and modernisation of the French Navy's current IP network. The RIFAN 2 network will have to meet the new needs of the French Navy (network integration of new vessels, including future FDI frigates; modernisation of the surveillance and detection system for cybersecurity incidents, etc.).
- ▶ As a subcontractor of BAE Systems, Rohde & Schwarz is supplying the SOVERON family of software-defined radios (SDR) for the Royal Navy's River-class offshore patrol vessels. The group is also participating in the Type 26 frigate programme, for which it is designing the integrated communications system (based on its NAVICS systems).

Technology and Innovation

- ▶ At the 2019 Defence & Security Equipment International (DSEI) exhibition in London, Rohde & Schwarz unveiled new solutions, including the next-generation ELINT R&S WPU2000 processor and COMINT/CSEM R&S RAMON software.
- ▶ In partnership with ESG and Diehl Defence, Rohde & Schwarz also presented the GUARDION UAV countermeasures system, which integrates its R&S ARDRONIS UAV countermeasures system.



BUSINESS AREAS

Engine manufacturer

- ▶ Aircraft, helicopter and UAS propulsion
- ▶ Naval propulsion (gas turbines, nuclear reactors, diesel engines)
- ▶ Civil nuclear energy
- ▶ Distributed generation system
- ▶ Services and MRO

GOVERNANCE

Chairman	Ian Davis
Chief Executive Officer	Warren East
President, Defence	Tom Bell

OWNERSHIP STRUCTURE (as of 20.11.2019)

Symbol	RR
Listed on	LSE
Market Cap (£m)	14 036

Major shareholders (as of 20.11.2019)

ValueAct Capital Management LP	9,35%
Baillie Gifford & Co.	5,26%
Harris Associates LP	5,01%
Causeway Capital Management LLC	4,04%

MAIN JOINT VENTURES AND ASSOCIATES

Name	%	Country
AirTanker Holdings Ltd	20%	United Kingdom
EUROJET Turbo GmbH	46%	Germany
EPI Europop International GmbH	44%	Germany
LHTEC	50%	United States
MTU Turbomeca Rolls-Royce GmbH	33,3%	Germany
TAEC Aircraft Engine Industry Corporation	49%	Turkey

KEY FIGURES (Fiscal year ended: December 31st)

€ millions	2015	2016	2017***	2018
Revenue*	18 394	16 809	15 588	17 025
Δ (%) [E]**	-3,68%	3,21%	-0,81%	10,21%
Defence (%)	23%	25%	23%	21%
Export (%)	87%	88%	88%	90%
Résultat d'exploitation*	2 055	1 116	349	696
Operating margin (%)*	11,17%	6,64%	2,24%	4,09%
Net income*	1 489	673	50	345
Order book	104 086	94 521	62 007	70 503
Employees	50 500	49 900	50 000	54 500

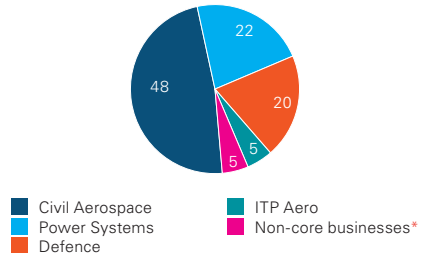
*Underlying and after eliminations.

**Variation based on revenue in local currency.

See €/£ exchange rates p.7

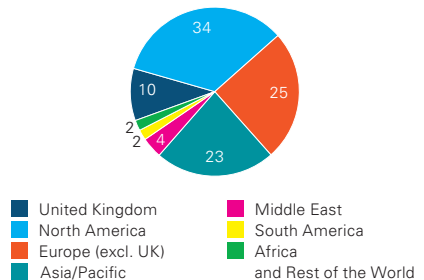
***2017 figures restated.

REVENUE BY BUSINESS LINE (%)



*Including L'Orange (Rolls-Royce Power Systems subsidiary) and Commercial Marine, businesses respectively sold on 2018 and 2019.

REVENUE BY REGION (%)*



*Revenue distribution based on total sales excluding eliminations.

MAIN PROGRAMMES, COOPERATIONS AND EXPORT PARTNERSHIPS

	Safran	MTU Aero	Avio Aero*	Pratt & Whitney**	Honeywell	Standard Aero	Naval Group	Jiangsu A-Star	Embraer	Reaction Engines	BAE Systems	GRSE
Aircraft engines												
RB199 turbojet engine (Tornado)	●	●										
EJ200 turbojet engine (Eurofighter)	●	●										
LiftSystem (F-35B)				●								
Adour turbojet engine (BAE Hawk AJT)	●											
TP400-D6 turboprop engine (A400M)	●	●										
T56 and AE2100 turboprop engines (C-130)					●							
AE3007 turbojet engine (EMB145 AEW&C)					●			●				
Tempest fighter aircraft programme											●	
Hypersonic propulsion systems project									●		●	
Helicopter engines												
MTR390-E turboshaft engine (Tiger)	●	●										
CTS800 turboshaft engine (Dhruv, A129, UH-1Y, AW159 Wildcat)				●								
AE1107 turboshaft engine (V-22 Osprey)					●							
M250 turboshaft engine (OH-58D, AH-6, RQ-8A)					●		●					
UAS propulsion												
AE3007 turbojet engine (RQ-4 Global Hawk, MQ-25 Stingray and MQ-4C Triton)												
Naval and submarines propulsion												
MT30 gas turbine (Queen Elizabeth-class aircraft carriers, T26-class frigates, Hunter-class frigates)												
WR-21 gas turbine (T45-class destroyers)							●					
PWR-2 (Vanguard, Astute) and PWR-3 (Successor programme) nuclear reactors												
MTU 12V/16V 4000 M90 diesel engine												●

*General Electric group **UTC group

STRATEGIC HIGHLIGHTS

Business trends

- ▶ Rolls-Royce is a British engine manufacturer and one of the world's main suppliers of aeronautical and naval propulsion systems for both civil and military applications.
- ▶ Excluding equity investments and other participations, the group's revenue increased 10% to \$15bn (€17bn) in 2018, driven by the Power Systems and Civil Aerospace divisions. Defence revenues accounted for 21% of revenue, a slight decrease compared to 2017 (23%).
- ▶ Faced with difficulties in recent years, Rolls-Royce has been implementing a restructuring plan since 2015. In 2018, the group again reduced its non-manufacturing staff (support functions in particular). 1,300 jobs are affected and a total of about 4,600 jobs could be cut by 2020.
- ▶ After the 2018 sale of L'Orange, a manufacturer of injection systems for diesel engines, to U.S.-based Woodward Inc., Rolls-Royce sold its Commercial Marine division to Kongsberg in April 2019. The divestments came as part of the company's objective to focus on its 3 main activities: Civil Aerospace, Power Systems and Defence.

Home market

- ▶ The group generated 10% of its turnover on the British market in 2018. Rolls-Royce is the undisputed leader in the British market for military ship engines and turbines, a position it has further strengthened with the recent launch of the Royal Navy's T26 frigate programme, of which BAE Systems is the prime contractor and for which Rolls-Royce supplies the MT30 turbines.
- ▶ Rolls-Royce (engines) has partnered with BAE Systems, Leonardo (advanced sensors, electronics, avionics) and MBDA (weapons systems), since then joined by the Swedish Ministry of Defence and several Italian companies (Elettronica, Leonardo Italy, Avio Aero and MBDA Italy) to develop the Tempest future fighter aircraft that will replace the Royal Air Force's Eurofighter Typhoon. The British Ministry of Defence (MoD) could invest about £2bn (€2.26bn) in this programme by 2025.
- ▶ The group was selected by the British Ministry of Defence for a £350m (€396m) contract to maintain the EJ200 turbojet engines that power the Royal Air Force's Eurofighter Typhoon.

Export markets

- ▶ The United States accounted for over 30% of Rolls-Royce's turnover and remains the group's largest market. In 2018, the group won a 6-year, \$420m (€356m) maintenance contract for the Rolls-Royce engines of the U.S. Air Force and U.S. Navy Global Hawk and Triton UAVs. Rolls-Royce was also selected by Boeing to equip the future U.S. Navy MQ-25 Stingray UAVs with its AE3007N turbojet engine.
- ▶ In June 2019, the Royal Thai Air Force became the first export customer for Rolls-Royce's upgraded T56 Series 3.5 turboprop engine, which will update the country's fleet of C-130H Hercules transport aircraft.
- ▶ In September 2019, the group completed the production of its 50th MT30 turbine. The turbine will be delivered to Japan's Kawasaki Heavy Industries (KHI), with which Rolls-Royce has been partnering for more than 50 years to equip the Japanese Navy's fleet.

Technology and Innovation

- ▶ Defence R&D expenditure amounted to £100m (€113m) in 2018, a 12% increase in local currency compared to 2017 (£89m or €101m).
- ▶ Rolls-Royce is partnering with Reaction Engines and BAE Systems to develop a hypersonic propulsion system. A £10m (€11.3m) contract was signed in July 2019 by the three partners with the British Ministry of Defence to launch studies (design, research, etc.) for the future engine.



BUSINESS AREAS

Platform manufacturer and systems integrator

- ▶ Commercial aeronautics (fuselage sections, assembly, equipment)
- ▶ Defence (land and aircraft systems, simulation systems, C4I systems)
- ▶ Small-calibre ammunition
- ▶ Space (structures, equipment)
- ▶ Aerostructures

GOVERNANCE

Chairman

Chief Executive Officer

Chief Financial Officer

Remo Lütolf
Urs Breitmeier
Urs Kiener

OWNERSHIP STRUCTURE

Symbol

Listed on

Market Cap

Unlisted group

Major shareholders (as of 20.11.2019)

Federal Authorities of the Swiss Confederation

100%

MAIN JOINT VENTURES AND ASSOCIATES

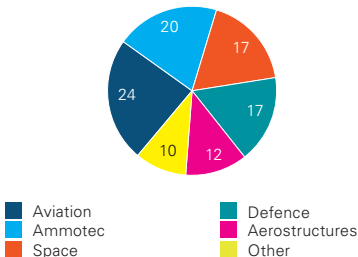
Name	%	Country
RUAG Aviation Malaysia SDN BHD	65%	Malaysia
Nitrochemie AG	49%	Switzerland
RUAG Simulation Company LLC	49%	UAE
Arianespace Participation	3,5%	France

KEY FIGURES (Fiscal year ended: December 31st)

€ millions	2015	2016	2017	2018
Revenue	1 633	1 705	1 758	1 730
Δ (%) [CHF]*	-2,08%	6,54%	5,22%	2,20%
Defence (%)	45%	43%	44%	44%
Export (%)	62%	63%	62%	63%
Operating profit/loss	128	139	107	92
Operating margin (%)	7,86%	8,13%	6,09%	5,31%
Net income	110	106	80	64
Order book	1 271	1 449	1 371	1 592
Employees	8 163	8 734	9 189	9 127

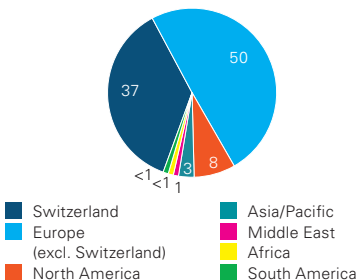
*Variation based on revenue in local currency. See €/CHF exchange rates p.7.

REVENUE BY BUSINESS LINE (%)*



*Revenue distribution based on total sales excluding eliminations. Unbundling of defence activities is ongoing.

REVENUE BY REGION (%)



MAIN PROGRAMMES, COOPERATIONS AND EXPORT PARTNERSHIPS

	HAL	Elbit Systems	United Launch Alliance*	Rheinmetall Defence	Saab AB	KMW**	Dassault Aviation	BAE Systems	Arianespace***	Safran	Thales
Aeronautics											
Dornier 228NG aircraft	●										
Aerostructures (F/A-18, F-5 Tiger, Gripen, PC-21)				●							
900 Starliner/HFE Hermes UAS	●										
nEUROnUCAV demonstrator (wind tunnel tests and weapons interface unit)						●					
OPATS laser-based automatic landing system for UAS											
ISSYS-Pod integrated self-protection system				●							
Flight simulators (F/A-18 SHOTS and SAMT, PC-7, MISIM ADS 95 Ranger UAV)											
Land systems											
COBRA 120mm mortar system											
IFV 2000 / CV90 infantry fighting vehicle							●				
Leopard 2 main battle tank mid-life upgrade			●		●						
M109 artillery system upgrade							●				
SidePRO, RoofPRO and MinePRO passive side protection solutions											
CERBERE programme (upgrade of the instrumentation for the French Army's live combat training centres)										●	
Gladiator personal harness for training											
C4ISR											
ARANEA tactical communications system											
Space systems											
Launcher fairings (Ariane 5 et 6, Atlas V-400, V-500)		●						●			
Missile guidance systems (S19 and GCS families)											

*Boeing/Lockheed Martin **KNDSS group ***ArianeGroup

STRATEGIC HIGHLIGHTS

Business trends

- ▶ Wholly owned by the Swiss State, RUAG is Switzerland's leading defence group and a major European player in small-calibre ammunition and aerospace. The group's main activities include MRO services as well as modernisation of the Swiss Army's fleets (aircraft, helicopters, armoured vehicles, etc.) and artillery systems. In 2018, it generated a turnover of CHF 2bn (€1.7bn).
- ▶ In late 2018, RUAG and Elbit Systems signed a memorandum of understanding for the creation of a Swiss joint venture designed to meet the military needs of the DDPS (Federal Department of Defence, Civil Protection and Sport).
- ▶ In 2019, RUAG began a restructuring process aimed at separating its national military activities from its civilian and international activities. As from January 1 2020, the group will be split into two independent entities: "MRO Switzerland", dedicated to providing services to the Swiss Army and controlled by the Swiss State, and which will mainly include the Aviation and Defence branches; and "RUAG International", which will include the Aerostructures and Space divisions and should be fully privatised in the medium term (possible IPO around 2021-2022).
- ▶ At the same time, RUAG divested its business jet operations with the July 2019 sale of its sites located at the Swiss airports of Geneva-Cointrin and Lugano-Agno to Dassault Aviation. The ammunition (Ammotec) and civil cybersecurity activities are also expected to be divested.

Home market

- ▶ RUAG achieved 44% of its turnover in the defence sector in 2018, 30% of which with DDPS, its main customer.
- ▶ At the end of 2018, the group signed a contract for the modernisation of eight Cougar transport helicopters of the Swiss Air Force (modernisation of electronic and navigation systems, etc.) by mid-2022.
- ▶ As part of the DDPS's Armed Forces' Voice System (VSdA) project, RUAG was chosen to provide and maintain the TTEL secure telephony solution.
- ▶ In September 2019, Switzerland's Council of States voted in favour of the purchase of new fighter aircraft for a maximum of CHF 6bn (€5.2bn) but asked that acquisitions made abroad be 100% offset (against 60% required by the Federal Council) by orders to Swiss companies, primarily RUAG. Airbus, Boeing, Dassault Aviation, Lockheed Martin and Saab AB are in competition for the programme. A decision is expected by early 2021.

Export markets

- ▶ The group generated 63% of its turnover from exports in 2018. RUAG Space extended its Austrian site dedicated to thermal insulation products, in particular for the Ariane 6 rocket. On the other hand, the project to set up an ammunition factory in Brazil was cancelled by the Swiss government, which feared that Swiss arms export rules would be circumvented in this way.
- ▶ In 2019, RUAG will carry out the maintenance of three Dornier 228 aircraft of the Italian Army and in particular upgrade their avionics systems. In April 2019, the group also signed a six-year MRO contract for two Dornier 228 of the Bangladeshi Navy.
- ▶ As part of a contract signed in autumn 2018, RUAG in May 2019 completed the maintenance of NH90 helicopters for the German Army.
- ▶ After new ammunition orders in 2018, RUAG Ammotec strengthened its cooperation with the Austrian Army by signing a knowledge and know-how sharing agreement.

Technology and Innovation

- ▶ The Group's R&D expenditure amounted to CHF 179m (€155m) in 2018, representing 9% of sales.



BUSINESS AREAS

Platform manufacturer, systems integrator/
equipment supplier

- ▶ Military aircraft
- ▶ Naval platform and systems
- ▶ Missile systems and weapon systems
- ▶ Defence electronics
- ▶ C4ISR and early warning systems
- ▶ Information security and system integration
- ▶ Simulation

GOVERNANCE

Chairman M. Wallenberg

President and CEO M. Johansson*

Directeur branche Aeronautics J. Hjelm

*Appointed President and CEO in October 2019, replacing Håkan Buskhe.

OWNERSHIP STRUCTURE (as of 20.11.2019)

Symbol	SAAB B
Listed on	Nasdaq OMX Stockholm
Market Cap (SEKm)	43 669

Major shareholders (as of 20.11.2019)

Investor AB	28,90%
Knut and Alice Wallenberg Foundation	8,98%
Första AP Fonden	6,51%
Swedbank Robur Fonder AB	4,62%
AFA Sjukförsäkringsaktiebolag	3,17%

MAIN JOINT VENTURES AND ASSOCIATES

Name	%	Country
TAURUS Systems GmbH	33%	Germany
Akaer Participações S.A.	28,2%	Brazil
Gripen International KB	50%	Sweden
Fortis Marine Solutions	49%	Singapore
Vricon Inc.	50%	United States
UMS Skeldar AG	47%	Switzerland

KEY FIGURES (Fiscal year ended: December 31st)

€ millions	2015	2016	2017**	2018
Revenue	2 906	3 024	3 287	3 232
Δ (%)/ISEK [†] *	15,55%	5,32%	10,60%	4,71%
Defence (%)	82%	83%	84%	85%
Export (%)	58%	57%	58%	59%
Operating profit/loss	203	190	234	221
Operating margin (%)	6,98%	6,28%	7,12%	6,84%
Net income***	146	120	153	128
Order book	12 387	11 264	10 893	9 964
Employees	14 685	15 465	16 427	17 096

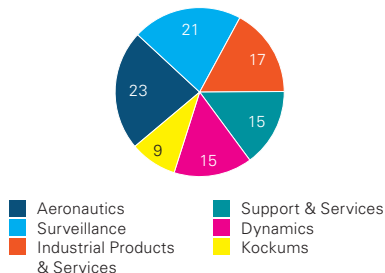
*Variation based on revenue in local currency.

See E/SEK exchange rates p. 7.

**2017 figures restated.

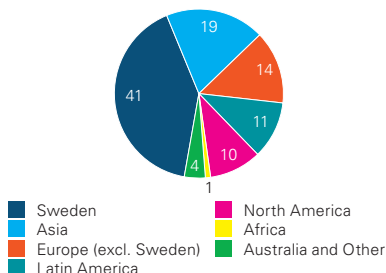
***Net income attributable to shareholders.

REVENUE BY BUSINESS LINE (%)



*Revenue distribution based on total sales excluding eliminations.

REVENUE BY REGION (%)



MAIN PROGRAMMES, COOPERATIONS AND EXPORT PARTNERSHIPS

	RUAG	Thales	MBDA	Embraer	BAE Systems	Dassault Aviation	Leonardo	AEL Systemas*	Bombardier	Diehl Defence	UMS Aero AG	Boeing	Denel
Military aircraft													
T7-A Red Hawk trainer aircraft**													●
Gripen JAS-39 E/F fighter aircraft	●	●	●			●	●						
Swordfish Maritime Patrol Aircraft (MPA) (embedded system)								●					
Saab 2000 GlobalEye and Erieye AEW&C solutions				●				●					
Skeldar V-200 VTOL UAV										●			
nEUROn UCAV demonstrator (main fuselage, landing gear doors, etc.)					●								
Missile systems and weapon systems													
AT4 and Carl Gustaf M4 man-portable support weapons													
Next generation Light Anti-tank Weapon (NLAW)													
RBS 70 NG very short range air defence missile system													
RBS15 Mk3 anti-ship missile system									●				
IRIS-T short range air-to-air missile									●				
METEOR beyond visual range air-to-air missile system			●										
TAURUS KEPD 350 modular stand-off missile system		●											
Defence and security solutions													
Giraffe and Sea Giraffe radars (AMB, 1X, 4A, 8A)													
A26-class attack submarines													
Defence electronics													
BOL advanced countermeasure dispenser				●									
Integrated Defensive Aids System (IDAS)	●												

*Elbit Systems group **FX programme

STRATEGIC HIGHLIGHTS

Business trends

- ▶ Saab AB is Sweden's leading defence group and the main supplier to the Swedish Army. In 2018, its revenue reached SEK 33.2bn (€3.2bn), up 4.7% in local currency. Growth was mainly driven by the acquisition, in late 2017, of two Swedish shipyards (N. Sundin Dockstarvarvet AB and Muskövarvet AB), following the acquisition of the Swedish shipyard TKMS AB (now Kockums) in 2014.
- ▶ In October 2018, Saab AB completed a capital increase of approximately SEK 6bn (€580m) as the group wishes to strengthen its financial capacities to ensure the development of its flagship programmes (Gripen fighter aircraft, A26 submarines, etc.), invest in R&D and position itself on new calls for tenders.
- ▶ In February 2019, Saab AB sold its South African subsidiary Saab Grintek Technologies to African Equity Empowerment Investments Ltd (AEEI), which offers radio communications and cybersecurity solutions, particularly for military applications. The amount of the transaction was not disclosed.
- ▶ The group announced the appointment of Micael Johansson as Chief Executive Officer and Executive Chairman, replacing Håkan Buskhe. The replacement is effective from the end of October 2019.

Home market

- ▶ Saab AB generated 41% of its turnover on the Swedish market in 2018. The group is a preferred partner of the Swedish Defence Materiel Administration (FMV), particularly in the combat aircraft and naval defence segments, and participates in all of the country's military programmes. Saab AB will notably deliver 60 Gripen E fighter aircraft (single-seat version) ordered by Sweden in 2014.
- ▶ Following the signing, in June 2019, of a 10-year contract for the supply of Carl-Gustaf rocket launchers to the Swedish Army, a first order of approximately SEK 330m (€31m) was placed.

Export markets

- ▶ Saab AB strengthened its international presence with the opening of a research centre in London (initial investment of £3.5m, or €3.9m), which will focus on radar, electronic warfare and cybersecurity. The group also plans to build a site in the United States from 2020, dedicated to the production and assembly of the T-7A Red Hawk trainer aircraft (T-X programme) co-developed with Boeing.
- ▶ The Sea Giraffe naval radar was selected by the U.S. Navy to be integrated on Independence-class LCS frigates (LCS 36 and LCS 38) and to equip the U.S. Coast Guard's Heritage-class offshore patrol vessels. Lockheed Martin Canada also chose the radar for the Canadian Navy's future Joint Support Ships (JSS).
- ▶ In September 2019, the Finnish Navy awarded Saab AB a €412m, eight-year contract for the supply and integration of combat systems on the Finnish Navy's four future Pohjanmaa-class corvettes, as part of the 2020 Squadron programme.
- ▶ During the same month, the company completed the assembly of the first of 36 Gripen fighter aircraft ordered by Brazil (including 28 single-seater and 8 two-seater versions, as part of the FX-2 fighter aircraft programme). The aircraft is expected to be delivered to Brazil by the end of 2020, once flight tests have been completed.

Technology and Innovation

- ▶ Total R&D expenditure amounted to SEK 7.6bn (€737m) in 2018, equivalent to 22.8% of revenue. Self-financed expenses represented 6.7% of revenue.
- ▶ Despite a memorandum of understanding between the British and Swedish Ministries of Defence, Saab AB is not yet joining the Team Tempest consortium, which is responsible for developing the future 6th-generation Tempest fighter aircraft. However, the group will be involved in the development of joint Swedish-British programmes, bringing its expertise in the integration of air combat systems.

BUSINESS AREAS

Engine manufacturer and systems integrator/
equipment supplier

- ▶ Aircraft engines, satellite and missile propulsion
- ▶ Aerospace equipment and systems
- ▶ Optronics, avionics, navigation systems, defence electronics and critical software
- ▶ UAV systems
- ▶ Security systems

GOVERNANCE

Chairman	Ross McInnes
Chief Executive Officer	Philippe Petitcolin
Chief Financial Officer	Bernard Delpit
CEO Safran Electronics & Defense	Martin Sion

OWNERSHIP STRUCTURE (as of 20.11.2019)

Symbol	SAF
Listed on	Euronext Paris
Market Cap (€m)	64 777

Major shareholders (as of 20.11.2019)

French State	11,70%
Employees	7,32%
Capital Research & Management Co. (World Investors)	4,38%
TCI Fund Management Ltd.	4,06%

MAIN JOINT VENTURES AND ASSOCIATES

Name	%	Country
ArianeGroup	50%	France
Roxel	50%	France
Sofradir	50%	France
CFM International SA	50%	France
EuroProp International GmbH	32,2%	Germany
Initium Aerospace	50%	United States

KEY FIGURES (Fiscal year ended: December 31**)

€ millions	2015**	2016	2017**	2018
Revenue	15 536	15 781	15 953	21 050
Δ (%)	1,18%	1,58%	1,09%	31,95%
Defence (%)***	~20%	~20%	~20%	~17%
Export (%)	76%	79%	83%	84%
Operating profit/loss	1 601	2 386	2 102	2 908
Operating margin (%)	10,31%	15,12%	13,18%	13,81%
Net income****	1 482	1 804	2 393	1 981
Order book	58 718	62 320	68 583	N/A
Employees*****	61 420	57 542	58 324	92 639

* Figures adjusted.

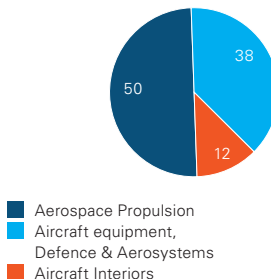
** 2015 and 2017 figures restated.

*** Estimated.

**** Net income attributable to shareholders.

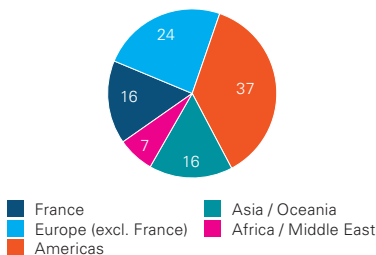
***** Excluding Security division since 2015.

REVENUE BY BUSINESS LINE (%)*



* Following the integration of Zodiac Aerospace in July 2019, a new operational organization has been set up.

REVENUE BY REGION (%)*



* Adjusted figures, including 10 months of Zodiac Aerospace revenue, consolidated since March 2018.

MAIN PROGRAMMES, COOPERATIONS AND EXPORT PARTNERSHIPS

	ITP	MTU Aero Engines	Rolls-Royce	MBDA	Diehl Defence	Ecrans	Thales	AVIC	Hensoldt	Mades	Nexter*	HAL
Aircraft engines												
M88 afterburning turbofan engine (Rafale)												
TP400 turboprop engine (A400M)	●	●	●									
RTM322 engine family (NH90, EH 101, AH Mk.1)												
Ardiden turboshaft family (Druhv, LCH, LUH, Ka-62, AC352)							●					●
MTR390-2C (Tiger HAP, ARH, UHT) and MTR390-E (Tiger HAD) turboshaft engines	●	●	●									
Next European Fighter Engine (NEFE, NGWS programme)		●										
Space propulsion												
Plasma propulsion (PPS 1350-G, PPS 1350-E, PPS 5000, TMA)												
Missile propulsion												
TR 60-30 (Apache, STORM SHADOW / SCALP EG) and TR 50 (MdCN / SCALP Naval) turbojet engines												
Navigation systems and optronics												
Geonyx™ inertial navigation system											●	
Euroflir™ 610 multispectral electro-optical targeting and observation system								●	●			
Missile systems and weapon systems												
Missile seekers (MICA IR, Mistral, MMP)			●									
HUSSAR air-to-ground missile				●								
UAV systems												
Patroller tactical drone					●							
Infantry												
NeoFelis integrated system for dismounted soldiers (upgrade of the FELIN system)												

*KNDS group

STRATEGIC HIGHLIGHTS

Business trends

- ▶ Safran is a leading French engine manufacturer and equipment supplier, particularly in the civil and military aeronautics sector. The group's defence activities include designing and producing aircraft engines (M88 for the Rafale), helicopter turbines (RTM322 for the NH90), avionics equipment, optronics equipment as well as sights and sensors. It also operates in the UAV segment and in activities related to space launchers (via ArianeGroup, its joint venture with Airbus).
- ▶ In early 2018, Safran completed the acquisition of Zodiac Aerospace, making it the world's second-largest manufacturer of aeronautical equipment (including propulsion systems) behind UTC (via Collins Aerospace, formerly Rockwell Collins). Following the acquisition, the group was reorganised into three business groups (Aerospace Propulsion, Aircraft Equipment, and Defence) compared to five previously. With the acquisition of Zodiac Aerospace, whose activities are more focused on civil aviation, the estimated share of defence activities in Safran's total revenue slightly declined, to 17% (20% before the transaction).
- ▶ Safran's adjusted revenue reached €21bn in 2018, a record high for the group. Revenue jumped 32% year-on-year, thanks to the integration of Zodiac Aerospace as well as good performances in all of the group's divisions. Safran now has more than 92,000 employees, compared to approximately 58,000 in 2017.
- ▶ In early 2019, Safran acquired ElectroMechanical Systems, previously controlled by Collins Aerospace, thus strengthening its position in the fields of aircraft flight control systems and cockpit equipment.

Home market

- ▶ For the Next European Fighter Engine (NEFE) that will power the future NGWS fighter aircraft, Safran will be the programme's prime contractor and German MTU Aero Engines will act as the main partner.
- ▶ Safran is also the prime contractor for the development of the Patroller airborne UAV demonstrator, a surveillance UAV designed for long endurance missions (more than 20 hours).

Export markets

- ▶ In order to secure new growth drivers, Safran has been pursuing a strategy of international expansion over the past years. In 2018, export sales accounted for more than 80% of the group's turnover.
- ▶ In 2018, the Netherlands Defence Materiel Organisation (DMO) chose Safran Vectronix to supply more than a thousand of its latest-generation Moskito TI binoculars. Additionally, Safran signed a framework contract enabling it to offer, in partnership with Nexter (KNDS group), its new Geonyx inertial navigation system, both in France and on export markets.
- ▶ In September 2018, Safran Electronics & Defense Australasia (SEDA) was selected by Saab Australia to supply its Vigy Engage electro-optical sensor for the surveillance systems of the 12 future RAN patrol vessels.
- ▶ In late 2018, the Danish Air Force awarded Safran Helicopter Engines the MCO (Maintenance in Operational Condition) contract for the Arirel 1D1 engines of 11 AS550C2 Fennec helicopters.
- ▶ In June 2019, Saab AB selected Safran's Auxiliary Power System to power the Boeing T-7A Red Hawk (T-X programme), a military training aircraft jointly developed by Boeing and Saab AB for the U.S. Air Force.

Technology and Innovation

- ▶ The group's self-financed R&D expenses amounted to €1.2bn in 2018, representing 5.8% of revenue.
- ▶ In early 2019 the group received funding from France's defence procurement agency (DGA), to carry out a five-year study programme (Turenne 2), in particular regarding the design of the hot section of engines.

BUSINESS AREAS

- Compact nuclear reactors designer
- ▶ Naval nuclear propulsion
- ▶ Support engineering for defence infrastructure
- ▶ Design and production engineering
- ▶ Reactors simulation and modelling physical phenomena
- ▶ MRO and services
- ▶ Civil nuclear energy

GOVERNANCE

Chairman and CEO	Loïc Rocard
Deputy CEO & Chief Operating Officer	Olivier Huet
Director of Defence Reactors	Bernard Gauducheau

OWNERSHIP STRUCTURE

Symbol	
Listed on	Unlisted group
Market Cap	

Major shareholders (as of 20.11.2019)

French State Holdings Agency (APE)	50,32%
Naval Group	20,32%
CEA	20,32%
EDF	9,03%

MAIN JOINT VENTURES AND ASSOCIATES*

Name	%	Country

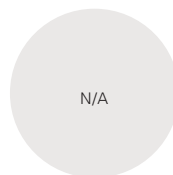
*No information available.

KEY FIGURES (Fiscal year ended: December 31st)

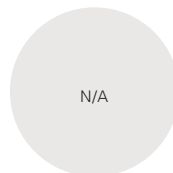
€ millions	2015	2016*	2017	2018
Revenue	N/A	353	372	398
Δ (%)	N/A	N/A	5,27%	7,10%
Defence (%)	N/A	N/A	N/A	N/A
Export (%)	N/A	N/A	N/A	N/A
Operating profit/loss	N/A	46	48	57
Operating margin (%)	N/A	13,03%	12,92%	14,32%
Net income	N/A	31	N/A	N/A
Order book	N/A	N/A	N/A	~1 000
Employees	N/A	N/A	N/A	1 625

*AREVA TA's financial statements.

REVENUE BY BUSINESS LINE (%)



REVENUE BY REGION (%)



MAIN PROGRAMMES, COOPERATIONS AND EXPORT PARTNERSHIPS

	CEA	Naval Group	Thales	Safran	MBDA
Naval nuclear propulsion					
Barracuda programme (Suffren-class nuclear-powered attack submarines)	●	●	●	●	●
RES programme (shore-based nuclear test reactor for French naval propulsion and its related facilities construction and operation)	●				
MRO and services					
Operational maintenance for Charles de Gaulle aircraft carrier nuclear steam supply systems		●	●	●	
Support engineering for defence infrastructure					
Assistance with the infrastructure transformation of Toulon and Brest naval bases					
Assistance with the engineering and operation of Laser MegaJoule	●				

STRATEGIC HIGHLIGHTS

Business trends

- ▶ TechnicAtome (formerly Technicatome and later Areva TA) is a specialist in the design, construction and maintenance of compact nuclear reactors. The group was formed in March 2017 following the sale by Areva of its majority shareholding in Areva TA to a consortium led by the French State Holdings Agency (APE, 50.32% of the capital) and composed of the French Alternative Energies and Atomic Energy Commission (CEA, 20.32% of the capital) and Naval Group (20.32% of the capital). French electric utility company EDF will retain its initial stake of 9.03% of the capital.
- ▶ In France, TechnicAtome is a major player in nuclear marine propulsion (propulsion of French Navy submarines as well as the Charles de Gaulle aircraft carrier). In the civil nuclear sector, TechnicAtome is involved in major French and international projects, such as the SMR (Small Modular Reactor) project, which involves the design of a small modular power reactor in partnership with EDF, the CEA and Naval Group.
- ▶ The group's turnover increased 7.1% to €398m in 2018. The order book stands at nearly €1bn, representing approximately three years of revenue. In 2018, the group's workforce increased by 10% to support its growing activity. TechnicAtome now has more than 1,600 employees.
- ▶ In March 2019, TechnicAtome inaugurated a training centre on the Cadarache site, one of CEA's nine research centres. In 2019, TechnicAtome will have welcomed approximately 1,600 trainees at its centre.
- ▶ TechnicAtome should continue to grow in the context of the French Military Programming Law for the 2019-2025 period, which provides for the renewal of the two components (maritime and airborne) of France's nuclear deterrence.

Home market

- ▶ A key player in the maintenance of nuclear boiler rooms, TechnicAtome participated, from 2016 to 2018 and under the management of Naval Group, in the renovation of the Charles de Gaulle aircraft carrier during the vessel's second major technical shutdown (ATM2). During the 18 months of intervention, the nuclear boiler rooms were controlled and the reactor cores recharged with new fuel. The renovation of the French nuclear-powered aircraft carrier was completed in November 2018.
- ▶ TechnicAtome has been working for over a decade on the Barracuda programme (next-generation nuclear attack submarines) alongside Naval Group (project management) and under the aegis of the French defence procurement agency (project management of the entire programme) and the CEA (project management of the boiler room and nuclear cores). Under the programme, TechnicAtome is responsible for the design and construction of the nuclear boiler room, as well as the manufacture of nuclear cores and the supply of equipment. In July 2019, the first of the six submarines of the programme, called Suffren, was launched. Sea trials will begin in the first quarter of 2020 and the remaining five vessels are expected to be delivered to the French Navy by 2030.
- ▶ TechnicAtome is also providing project management assistance for the infrastructures of the Toulon and Brest naval bases that will house the Barracuda programme's nuclear-powered attack submarines. The group is in particular responsible for the development of adaptation programmes for the infrastructures (basins).

Technology and Innovation

- ▶ TechnicAtome is participating, alongside Naval Group, Thales, MBDA, Dassault Aviation and Chantiers de l'Atlantique, in the study phase of the future French nuclear carrier programme. TechnicAtome is working on the boiler rooms that could equip the vessel in case the option for nuclear propulsion is chosen. The study programme, worth €40m, will last 18 months.
- ▶ The group is also participating, in partnership with its co-contractor Naval Group, in the preliminary design studies for the third-generation nuclear ballistic missile submarine programme (SNLE 3G). The study phase of the programme is expected to be launched in 2020 and construction of the first of the four vessels is expected to start in 2023.

BUSINESS AREAS

- Systems integrator/equipment supplier
 - ▶ Aerospace equipment and systems
 - ▶ Sensors, systems and communications
 - ▶ Weapon systems and ammunition
 - ▶ Training and simulation
 - ▶ Space (see also Thales Alenia Space)
 - ▶ Cybersecurity

GOVERNANCE

Chairman and CEO	Patrice Caine
Group Secretary & General Counsel	Isabelle Simon
Executive VP, Land and Air Systems	Alex Cresswell

OWNERSHIP STRUCTURE (as of 20.11.2019)

Symbol	HO
Listed on	NYSE Euronext
Market Cap (€m)	19 278

Major shareholders (as of 20.11.2019)

French State	25,70%
Dassault Aviation SA	24,70%
Employees	2,62%
DNCA Finance SA	1,96%
DWS Investments (UK) Ltd.	1,88%

MAIN JOINT VENTURES AND ASSOCIATES

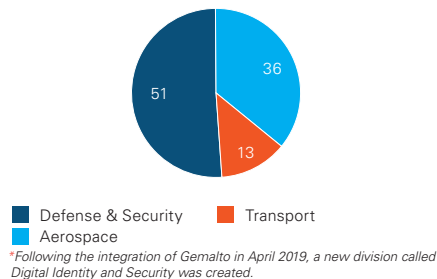
Name	%	Country
Naval Group	35%	France
Thales Alenia Space	67%	France
Telespazio S.p.A	33%	Italy
Electronica S.p.A.	33%	Italy
Diehl Aerospace GmbH	49%	Germany
Sofradir	50%	France
TRS AMDC2	50%	France
AirTanker Holdings Ltd	13%	United Kingdom

KEY FIGURES (Fiscal year ended: December 31st)

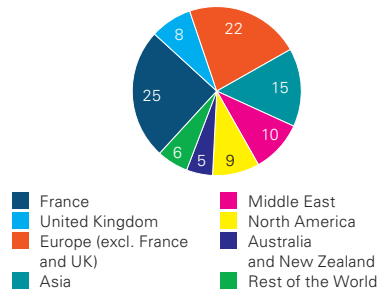
€ millions	2015	2016	2017*	2018
Revenue	14 063	14 885	15 228	15 855
Δ (%)	8,39%	5,85%	2,30%	4,12%
Defence (%)**	50%	50%	51%	51%
Export (%)	76%	76%	76%	75%
Operating profit/loss	1 216	1 354	1 365	1 685
Operating margin (%)	8,65%	9,10%	8,96%	10,63%
Net income***	809	897	840	1 178
Order book	32 292	33 530	32 064	32 239
Employees	62 194	64 071	64 860	66 135

*2017 figures restated.
 **Defence & Security division only.
 ***Net income attributable to shareholders.

REVENUE BY BUSINESS LINE (%)*



REVENUE BY REGION (%)



MAIN PROGRAMMES, COOPERATIONS AND EXPORT PARTNERSHIPS

	Elbit Systems	MBDA	Dassault Aviation	Nexter*	Indra Sistemas	Hensoldt	Naval Group	Raytheon	Boeing	Airbus
Combat systems and embedded electronics										
SPECTRA electronic warfare suite	●	●								
RBE-2 AESA radar		●								
Targeting Long-range Identification Optronic System (TALIOS)		●								
TopOwl and Scorpion helmet mounted display										
NGWS future fighter aircraft (defence electronics)				●	●					
Man Machine Teaming advanced study programme		●								
Mission and surveillance systems										
CONTACT and SYNAPS software defined radio										
Watchkeeper WK450 UAV	●									
ARCHANGE programme (payload sensor development)		●								
Radar and sonar systems										
Ground Master (200 and 400) and Ground Fire radars								●		
Sea Fire radar						●				
Missile, weapon systems, ammunition										
RAPIDFire and RAPIDFire Naval air defence systems			●							
Missile guidance systems (Aster, MICA)	●									
SAMP/T surface-to-air missile defence system	●									
Military vehicles										
4X4 Bushmaster infantry mobility vehicle										
4X4 Hawkei light armoured vehicle									●	
Cybersecurity										
Stormshield Data Security										●

*KNDS group

STRATEGIC HIGHLIGHTS

Business trends

- ▶ Thales is a French group involved in dual activities and a key supplier of defence equipment and systems. It also operates in the fields of aviation, security, transportation and space (via Thales Alenia Space). Its turnover reached €15.9bn in 2018, up 4.1% from 2017.
- ▶ Sales in the Defense and Security division, the group's largest (more than 50% of total revenue), increased by 4.3% (+5.6% in organic terms) thanks to a good performance in the fields of surface radars, fighter aircraft systems, military radiocommunications, and cybersecurity.
- ▶ In April 2019, Thales completed the acquisition of Gemalto, a Dutch-based digital security company, for €4.8bn. The transaction involved a reorganisation of the group's operations, with the creation of a new Security and Digital Identity division, the group's fourth, which combines Gemalto's activities and some of Thales' IT activities.

Home market

- ▶ Thales generates about 25% of its sales in France, a share that has remained relatively stable in recent years. The group is a key partner of Dassault Aviation (Rafale fighter aircraft, Epicure Falcon surveillance aircraft, etc.) and Naval Group (FDI / Belharra frigates, FREMM frigates, etc.).
- ▶ At the end of 2018, the French defence procurement agency (DGA) ordered the modernisation of six ATL2 maritime patrol aircraft in addition to the 12 already planned in order to extend their lifespan until 2030. Dassault Aviation and Thales will be responsible for the modernisation programme, which should be completed by 2025, while Naval Group will work on the aircraft information processing software. The first modernised aircraft are scheduled to enter service in 2021.
- ▶ In January 2019, at France's request, the Organisation for Joint Armament Co-operation (OCCAR) awarded a €1.7bn contract to Naval Group, Chantiers de l'Atlantique and Thales to build four Force Supply Vessels (FSS) for the French Navy (FLOTLOG programme) and provide related MCO services for six years.
- ▶ At the end of 2019, Thales and Airbus Cybersecurity, an Airbus Defence & Space business, joined forces in the French cybersecurity market to make a joint offer to France's 200 "operators of vital importance" (OIV) in the fields of energy, banking, defence, telecommunications and networks.

Export markets

- ▶ Thales generates about three quarters of its turnover in international markets. The group pursued its multi-domestic strategy with the March 2019 opening of an engineering skills centre in Bucharest (Romania) to support the local development of certain activities, such as space, aeronautics and defence.
- ▶ At AerolIndia 2019, Thales received an order from Hindustan Aeronautics Limited (HAL) to supply 135 70-mm 12-tube rocket launchers. Thales' rocket launchers will be integrated on 18 Avanced Light Helicopters (ALH) and 15 Light Combat Helicopters (LCH).
- ▶ As part of the Belgian Army's CaMo (Motorised Capacity) programme, France's DGA in June 2019 awarded Nexter a €1.6bn contract to supply 60 Jaguar EBRCs and 382 Griffon VBMRs from 2025 onwards. Thales is one of Nexter's main partners in this programme, which will also include Arquus and Belgian manufacturers FN Herstal and John Cockerill (formerly CMI Defence).

Technology and Innovation

- ▶ The group's self-financed R&D expenditure amounted to €879m in 2018, up 9.6% year-on-year. The R&D ratio reached 5.6%, in line with the objectives of Thales' Ambition 10 strategic plan, which was launched in 2014.
- ▶ A few months after Thales' integration into the development of the Rafale F4 standard, France's Minister of the Armed Forces confirmed the group's participation in the future European fighter aircraft (NGWS). The French company will be in charge of defence electronics alongside Germany's Hensoldt and Spain's Indra Sistemas.



BUSINESS AREAS

Platform manufacturer and systems integrator/
equipment supplier

- ▶ Satellite platforms (satellite buses)
- ▶ Ground control segment
- ▶ Electronics, propulsion systems, recovery systems
- ▶ Payloads
- ▶ Manned space systems
- ▶ Space transport

GOVERNANCE

Chairman and CEO Jean-Loïc Galle
Chief Financial Officer Évrard Decourcelle

KEY FIGURES (Fiscal year ended: December 31st)

€ millions	2015	2016	2017	2018
Revenue	~2 100	~2 400	~2 600	~2 500
Δ (%)	=	~14%	~8%	~-3,8%
Defence (%)	N/A	N/A	N/A	N/A
Export (%)	N/A	N/A	N/A	N/A
Operating profit/loss	N/A	N/A	N/A	N/A
Operating margin (%)	N/A	N/A	N/A	N/A
Net income	N/A	N/A	N/A	N/A
Order book	N/A	N/A	N/A	N/A
Employees	~7 500	7 980	7 980	~8 000

OWNERSHIP STRUCTURE

Symbol
Listed on Unlisted group
Market Cap

Major shareholders (as of 20.11.2019)

Thales	66,66%
Leonardo	33,33%

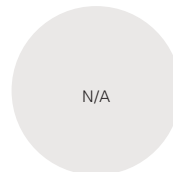
REVENUE BY BUSINESS LINE (%)



MAIN JOINT VENTURES AND ASSOCIATES

Name	%	Country
Pyxalis	15,53%	France
AirStar Aerospace	8,61%	France
Altec SpA	63,75%	Italy
RASCOMSTAR QAF	12,36%	Mauritius
Universum Space Technologies	40%	Russia
LeoStella LLC	50%	United States
Spaceflight	N/A	United States

REVENUE BY REGION (%)



MAIN PROGRAMMES, COOPERATIONS AND EXPORT PARTNERSHIPS

	Airbus	Safran	Visiona TE	Indra Sistemas	Leonardo	Thales	OHB Group	Northrop	Grumman*	AirStar Aerospace	Groupe CNIM	ATR**	Cenac
Satellite platforms (satellite buses)													
Spacebus NEO (Syracuse 4) platform	●	●			●								
Proteus (Göktürk 1) and ELiTeBus (Iridium-NEXT) platform					●		●						
Stratobus project								●		●			
Payloads													
Sensor electronics units (SAR-Lupe)													
Communications satellite													
SGDC Geostationary Defense and Strategic Communications Satellite			●										●
Ital-GovsatCom communication satellite													
Spainsat NG new generation satellite	●												
Manned space systems and space transport													
Cygnus pressurized cargo module (PCM)							●						
Earth observation													
Cosmo-SkyMed 2G dual radar observation system				●	●								
CSO optical earth observation satellite	●												
Meteosat3G meteorological satellite					●	●							
Satellite navigation systems													
GALILEO							●						
EGNOS			●	●	●	●							
EDG ² E project					●						●		
Propulsion system													
XPS subsystem (plasma propulsion system)		●											

*Innovation Systems division, formerly Orbital ATK **Joint venture between Airbus and Leonardo

STRATEGIC HIGHLIGHTS

Business trends

- ▶ Thales Alenia Space, 67% owned by France's Thales and 33% by Italy's Leonardo, is a European and worldwide leader in satellites, space infrastructure and navigation systems. In the military sector, the group provides telecommunications and observation systems, optical payloads, as well as high-resolution radars.
- ▶ Thales Alenia Space is part of the Space Alliance, alongside Telespazio (satellite systems, connectivity solutions and services, etc.). The group also has two main joint ventures: LeoStella LLC (design and manufacture of small satellites, held in equal ownership with U.S. aerospace company Spaceflight) and Altec (engineering services associated with space infrastructure, 63.75% owned by Thales Alenia Space Italy and 36.25% owned by the Italian Space Agency).
- ▶ In 2018, the group's turnover reached €2.5bn. After two years of growth, activity declined by around 4%, mainly due to sluggish orders for observation and telecommunications satellites.
- ▶ In September 2019, Thales Alenia Space inaugurated an automated production site in Hasselt (Belgium). Representing an investment of €20m, this "4.0" industrial centre is dedicated to the assembly of photovoltaic cells for satellite solar panels. On the other hand, the group is considering cutting around 450 full-time equivalent positions (through redundancies or non-replacement) at its Cannes and Toulouse sites, in particular due to uncertainties surrounding future satellite orders in the coming years.

Home market

- ▶ Thales Alenia Space is a key partner of the French defence procurement agency (DGA), and as such, is involved in the Ministry of the Armed Forces' main space programmes (Syracuse 4, CSO, etc.)
- ▶ In 2019, the DGA awarded Thales Group the contract to design and build the ground segment of the Syracuse 4 programme, the next-generation satellite communication system of the French Armed Forces. Thales Alenia Space will participate in the programme's design phase. The contract provides for the delivery of the first ground stations in 2021.
- ▶ In June 2019, the group signed a collaboration agreement with Germany's DLR GfR for the maintenance of the Galileo Mission Segment (GMS, European satellite navigation system).

Export markets

- ▶ At the end of 2018, Thales Alenia Space announced the signing of two contracts, one with Korea Aerospace Industries (KAI) and the other with Hanwha Systems Corporation (HSC), to develop a constellation of four observation satellites as part of the Korea 425 project on behalf of the Agency for Defence Development (ADD), the agency responsible for defence programmes in Korea.
- ▶ In May 2019, Hisdesat Servicios Estratégicos selected the consortium composed of Thales Alenia Space and Airbus in Spain and France to design and produce two next-generation Spainsat satellites. These latter are intended to replace the Spainsat and XTar-EU satellites, which currently power the country's government communications. The first of these satellites will be launched in 2023.
- ▶ The Space Alliance (Thales Alenia Space and Telespazio) signed a contract with the Italian Space Agency for the first phase of development of the Ital-GovSatCom satellite system, which will provide Italy with communication services, in particular for defence applications.

Technology and Innovation

- ▶ At the end of 2019, Thales Alenia Space presented Space Inspire (Instant Space In-Orbit Reconfiguration), a new range of reprogrammable satellites capable of adjusting their mission while in orbit and their geographical coverage, thanks in particular to innovative digital equipment.



BUSINESS AREAS

Platform manufacturer and systems integrator
German conglomerate Thyssenkrupp AG's naval division

- ▶ Surface ships
- ▶ Submarines
- ▶ Ammunition
- ▶ Unmanned vehicles (surface and underwater)
- ▶ Maritime security systems and mine warfare systems
- ▶ Sonar and acoustic systems
- ▶ Equipment and maintenance

GOVERNANCE

Chief Executive Officer
Chief Financial Officer
Chief Project Officer

Dr. Rolf Wirtz
Dr. S. C. Schulte
Andreas Burmester

OWNERSHIP STRUCTURE

Symbol
Listed on
Market Cap

Unlisted division

Major shareholders (as of 20.11.2019)

ThyssenKrupp AG	100%
-----------------	------

MAIN JOINT VENTURES AND ASSOCIATES

Name	%	Country
Kta Naval Systems	50%	Norway
ThyssenKrupp Tata Steel B.V	50%	Netherlands
ThyssenKrupp Marin Sistem Gemi Sanayi ve Ticaret A.S.	60%	Turkey
MTG Marinetechnik GmbH	49%	Germany
Lisnave-Estaleiros Navais S.A.	20%	Portugal
Blohm & Voss	40%	Qatar
German Naval Technology		

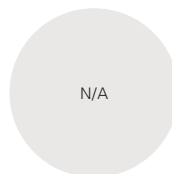
KEY FIGURES (Fiscal year ended: September 30th)*

€ millions	2014-15	2015-16	2016-17	2017-18**
Revenue	~1 700	~1 600	~1 700	~1 400
Δ (%)	-2,47%	-5,88%	6,25%	-17,65%
Defence (%)	N/A	N/A	N/A	N/A
Export (%)	N/A	N/A	N/A	N/A
Operating profit/loss	N/A	N/A	N/A	-128
Operating margin (%)**	N/A	N/A	N/A	-9,14%
Net income	N/A	N/A	N/A	N/A
Order book	N/A	N/A	N/A	N/A
Employees	~3 200	~3 200	~3 500	~3 400

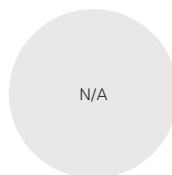
*Main figures excluding Atlas Elektronik, consolidated subsidiary since April 2017

**Operating profit/loss adjusted (EBIT).

REVENUE BY BUSINESS LINE (%)



REVENUE BY REGION (%)



THYSSENKRUPP MARINE SYSTEMS (TKMS)

MAIN PROGRAMMES, COOPERATIONS AND EXPORT PARTNERSHIPS

	Roketsan	Embraer	Fincantieri	Diehl Defence	Lürssen	HHL*	ST Engineering	Kongsberg	Golçuk Shipyards	SMW Gdynia**	GNV***	Nammo	DSME
Conventionally-powered attack submarines													
TKMS								•					•
Atlas Elektronik			•										
TKMS				•				•					•
TKMS					•			•					•
TKMS						•							
TKMS							•						
TKMS								•					
Surface ships													
TKMS				•									
TKMS								•					
TKMS				•					•				
TKMS		•											
Naval systems, equipment, ammunition													
TKMS	•		•				•						•
TKMS							•						
Atlas Elektronik													
Atlas Elektronik													
Atlas Elektronik													
Unmanned systems													
Atlas Elektronik													
Atlas Elektronik													

*Hyundai Heavy Industries **PGZ group ***German Naval Yards Kiel

STRATEGIC HIGHLIGHTS

Business trends

- ▶ ThyssenKrupp Marine Systems (TKMS) is the naval division of German industrial conglomerate ThyssenKrupp AG (€42.7bn in revenue in 2017/2018, over 161,000 employees), through the latter's Industrial Solutions activities. Excluding Atlas Elektronik (sonars and acoustic systems, ammunition, surface and underwater drone systems, combat and demining systems), a subsidiary consolidated within TKMS since April 2017, the company represents around 4% of ThyssenKrupp's revenue and 2% of its workforce.
- ▶ In May 2019, ThyssenKrupp AG abandoned its plan to split into two listed entities: ThyssenKrupp Industrials (elevators, plant engineering and car parts) and ThyssenKrupp Materials (materials trading and shipbuilding). The industrial conglomerate, which is now considering divesting its elevator activities (€7.6bn in 2017/2018, or 16.9% of revenue) through an initial public offering, is also looking to sell all or parts of these activities.
- ▶ At SubCon 2019, Kta Naval Systems, a joint venture of TKMS, Atlas Elektronik and Kongsberg, unveiled a new conventional submarine combat system called ORCCA. The system will be installed on HDW-class 212 submarines ordered by Norway from TKMS.

Home market

- ▶ The TKMS division remains dependent on orders from the German Navy, in particular via the F125 frigate programme (four-unit contract worth €2bn). In June 2019, the first of the four frigates, named Baden-Württemberg, initially delivered at the end of 2016 with quality issues, was officially put into service. The second unit is scheduled to be delivered by the end of 2019, with the other two to be delivered within two years.
- ▶ The construction of the first of the five new Braunschweig-class corvettes, called Köln, was launched in February 2019. Under this €2.4bn contract, involving the ARGE K130 consortium (composed of TKMS, Lürssen Defence and German Naval Yards Kiel), the last corvette is scheduled to be delivered by 2025. The combat systems will be provided by Atlas Elektronik, a TKMS subsidiary, which is associated with Thales Deutschland as part of the FüWES K130 consortium.
- ▶ TKMS is participating, alongside German Naval Yards Kiel, in the German Navy's call for tenders for the supply of MKS 180 multi-mission vessels, which will replace the Type 143 fast attack crafts and F123 Brandenburg-class frigates from 2023. A decision should be taken by the first quarter of 2020 at the latest.

Export markets

- ▶ TKMS is currently positioned in several tenders, notably in India (P75I programme for six submarines) and the Netherlands (four Walrus-class submarines).
- ▶ The company won a maintenance contract for the Indian Navy's Type 209 Shishumar-class submarine (built by TKMS), in partnership with India's Mazagon Dock Shipbuilders (MDL). The contract, worth several tens of millions of euros, runs until 2021.
- ▶ The Águas Azuis consortium (comprising TKMS and Embraer Defence & Security) was selected by the Brazilian Navy to supply four escort corvettes (CCT programme valued at \$1.6bn, or €1.4bn). The contract was won against three other consortia: Damen/Saab Tamandaré, Fincantieri/Vard, and Naval Group/Enseada.
- ▶ The Bundestag Budget Committee authorised the sale of six MEKO A-200 frigates to Egypt, following a contract signed between the two countries in 2018. The German Security Council has yet to approve the supply of five of them. At the same time, TKMS in May 2019 began construction of the third Type 209/1440 submarine (out of the four ordered by the Egyptian Navy) at the Kiel shipyard.

Technology and Innovation

- ▶ In February 2019, TKMS and the Singapore-based Defence Science Technology Agency (DSTA) signed a memorandum of understanding to collaborate on the development of new technologies for naval applications.



UNITED AIRCRAFT CORPORATION (UAC)

BUSINESS AREAS

Platform manufacturer and systems integrator

- ▶ Fighter aircraft (MiG, Sukhoi)
- ▶ Trainer aircraft (Yakovlev)
- ▶ Strategic bombers (Tupolev)
- ▶ Transport and special purpose aircraft (Antonov, Beriev, Ilyushin)
- ▶ Unmanned aircraft systems

GOVERNANCE

Chairman

A.Serdyukov

Chief Executive Officer

Y. B. Slyusar

Chief Financial Officer

A.Demidov

KEY FIGURES (Fiscal year ended: December 31st)

€ millions	2015	2016	2017	2018
Revenue	5 085	5 623	6 852	5 559
Δ (%) / [RUB]*	17,51%	20,46%	8,36%	-8,90%
Defence (%) **	79%	73%	71%	N/A
Export (%) **	25%	30%	30%	N/A
Operating profit/loss	-9	181	328	290
Operating margin (%)	-0,17%	3,22%	4,78%	5,23%
Net income	-1 210	1	N/A	-4
Order book	22 261	N/A	N/A	N/A
Employees	96 545	96 787	~102 000	N/A

*Variation based on revenue in local currency. See €/RUB exchange rates p.7.

**Based on the number of delivered units.

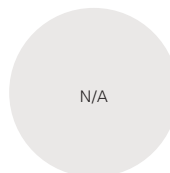
OWNERSHIP STRUCTURE

Symbol	UNAC
Listed on	CJSC MICEX
Market Cap	N/A

Major shareholders (as of 20.11.2019)

Russian State	76,24%
Federal Agency for State Property Management	8,17%

REVENUE BY BUSINESS LINE (%)



MAIN JOINT VENTURES AND ASSOCIATES

Name	%	Country
Indo-Russian Aviation Ltd	31%	India
PJSC Company Sukhoi	81,25%	Russia
PJSC « Irkut »	86,95%	Russia
ATSC	25%	Malaysia

REVENUE BY REGION (%)



UNITED AIRCRAFT CORPORATION (UAC)

MAIN PROGRAMMES, COOPERATIONS AND EXPORT PARTNERSHIPS

	NADI (Malaysia)	UEC Saturn ^{**}	HAL	Kimov ^{**}	Aviastar	TAPC	Kapo	Kuznetsov ^{**}	SOKOL	Omsk Engine	TsAGI
Transport and special purpose aircraft											
Ilyushin Il-76MD-90A and Il-78M-90A transport/tanker aircraft				●	●						
Il-276/MTA tactical transport aircraft				●							
Il-112V light transport aircraft			●								
Strategic bombers											
Tupolev Tu-160 strategic bomber						●	●				
Tupolev Tu-95 strategic bomber							●				
Tupolev Tu-22M3 strategic bomber											
PAK DA long-range strategic bomber project											
Training aircraft											
Yak-130 training aircraft								●	●		
Yak-152 training aircraft											
Fighter aircraft											
MiG-29K and MiG-29KUB fighter aircraft	●			●							●
MiG-35 and MiG-35D fighter aircraft				●							
Sukhoi Su-27SK (Su-33) fighter aircraft		●									
Sukhoi Su-30MK multi-role fighter aircraft		●	●								
Sukhoi Su-30SM multi-role fighter aircraft											
Sukhoi Su-35 fighter aircraft (modernised version of the Su-27 fighter aircraft)		●									
Sukhoi Su-57 (T-50 PAK-FA/FGFA) 5th generation fighter aircraft		●									

^{*}Formerly NPO Saturn

^{**}United Engine Corporation (UEC) group

STRATEGIC HIGHLIGHTS

Business trends

- ▶ United Aircraft Corporation (UAC) is a Russian conglomerate comprising Russia's major civil and military aircraft manufacturers (Sukhoi, MiG, Tupolev, Ilyushin, Yakovlev, Beriev and Irkut). The group's turnover reached RUB 411.6bn (around €5.5bn) in 2018, down 8.9% compared to the previous financial year.
- ▶ In October 2018, the Russian President signed a decree authorising the takeover of UAC by the Rostec conglomerate (Kalashnikov Group, Russian Helicopters, etc.), a major player in the Russian defence industry, which accounts for almost two-thirds of the country's military production. The deal is expected to be completed in the first half of 2020.
- ▶ As part of the reorganisation of its commercial activities, UAC intends to merge all its subsidiaries dedicated to civil aviation. As a consequence, Sukhoi Civil Aircraft Company, UAC-Integration Center and New Civil Technologies will be combined into a single division, which in turn will be merged with Irkut Corporation, another UAC entity.
- ▶ In May 2019, Anatoly Serdyukov, former Russian Minister of Defence and Director of Rostec's Aviation division, became Chairman of UAC.

Home market

- ▶ The group remains highly dependent on its domestic market, with approximately 70% of the aircraft delivered coming from Russian orders.
- ▶ UAC is in charge of developing the Il-112V light transport aircraft, which will replace the Russian Air Force's ageing fleet of Antonov An-26 transport aircraft. In March 2019, the Il-112V prototype completed its first flight test.
- ▶ UAC is also in charge of developing Russia's 5th-generation Su-57 (formerly T-50) fighter aircraft. In May 2019, the Russian President announced the acquisition of 76 Su-57 by 2028, for an estimated amount of \$2.6bn (approximately €2.2bn). Two prototypes of the Su-57 are expected to be delivered to the Russian Air Force by the end of 2019, followed by two additional units in 2020.

Export markets

- ▶ After India's withdrawal from the MTA tactical transport aircraft (2017) and Su-57 fighter aircraft co-development projects that were part of India's Fifth Generation Fighter Aircraft (FGFA) programme of 2018, the country also reduced its orders for Sukhoi Su-30MKI fighter aircraft. Assembled locally by India's HAL, about 12 units are produced each year. Production is expected to be completed by March 2020. In the end, India could order 18 additional Su-30MKI.
- ▶ UAC was selected by Egypt to supply more than 20 Sukhoi Su-35 fighter aircraft under a contract worth approximately \$2bn (approximately €1.8bn). The group is also finalising the delivery of China's 24 Su-35s.
- ▶ Following Turkey's eviction from the F-35 programme in July 2019, as part of U.S. sanctions over Ankara's acquisition of the Russian S-400 air defence system, discussions are ongoing between the Russian and Turkish governments for the acquisition of Su-35 and Su-57 fighter aircraft.
- ▶ At the Russian MAKS 2019 exhibition, UAC, which aims to develop its export sales (particularly in the Middle East, Southeast Asia and Latin America), unveiled the Su-57E, the export version of the Su-57. The Su-57E was also presented at the Dubai Air Show in November 2019. Discussions for possible orders are reportedly ongoing with India, Vietnam and Myanmar. The Middle East might also be a target market.

Technology and Innovation

- ▶ The group is continuing its work on the PAK DA next-generation long-range strategic bomber, which could replace all Russian Air Force bombers. UAC also aims to develop a new fighter aircraft, the MiG-41, which would succeed the Su-57.



BUSINESS AREAS

Systems integrator/equipment supplier

- ▶ Commercial and military aircraft and helicopter engines (turbofan and turboprop engines), auxiliary power units
- ▶ ISR systems and communication systems
- ▶ Aerostructures and aircraft equipment (landing gears, propeller systems, wheels, carbon brakes, actuation systems, etc.)

GOVERNANCE

Chairman and CEO	Gregory J. Hayes
Chief Financial Officer	Akhil Johri
President of Pratt & Whitney*	Robert F. Leduc

*To be replaced by Christopher Calio as of 2020.

OWNERSHIP STRUCTURE (as of 20.11.2019)

Symbol	UTX
Listed on	NYSE
Market Cap (\$m)	127 818

Major shareholders (as of 20.11.2019)

SSgA Funds Management, Inc.	10,80%
The Vanguard Group, Inc.	7,93%
Capital Research & Management Co.	6,73%
Wellington Management Co. LLP	2,60%
BlackRock Fund Advisors	2,27%

MAIN JOINT VENTURES AND ASSOCIATES

Name	%	Country
Advanced Turbine Engine Company LLC	50%	United States
Engine Alliance LLC	50%	United States
International Aero Engines AG	61%	Switzerland

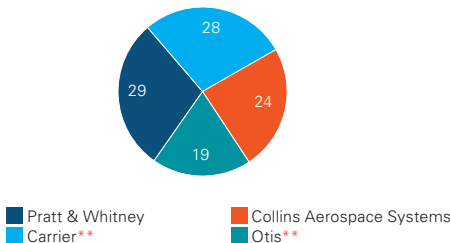
KEY FIGURES (Fiscal year ended: December 31**)

€ millions	2015	2016	2017	2018
Revenue	50 539	51 711	52 953	56 309
Δ (%)/[\$]*	-3,11%	2,04%	4,53%	11,14%
Defence (%)	12%	12%	13%	14%
Export (%)	62%	62%	63%	63%
Operating profit/loss	6 568	7 426	7 202	7 242
Operating margin (%)	13,00%	14,36%	13,60%	12,86%
Net income**	3 600	4 575	4 028	4 461
Order book	76 951	87 856	82 402	100 873
Employees	197 200	201 600	204 700	240 200

*Variation based on revenue in local currency. See €/\$ exchange rates p.7.

**Net income attributable to shareholders.

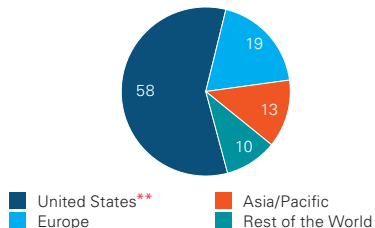
REVENUE BY BUSINESS LINE (%)*



*Revenue distribution based on total sales excluding eliminations.

**Otis and Carrier are expected to be separated as part of the merger between UTC and Raytheon.

REVENUE BY REGION (%)*



*Revenue distribution based on total sales excluding eliminations.

**Including re-exports.

UNITED TECHNOLOGIES CORPORATION (UTC)

MAIN PROGRAMMES, COOPERATIONS AND EXPORT PARTNERSHIPS

	GKN	Honeywell International	Magellan	Rolls-Royce	MTU Aero Engines	Woodward	Avio Aero*	Cobham	IHI	Standard Aero	Meggitt
Military aircraft and helicopter engines											
F135 turbofan engine (F-35)	●		●	●		●		●	●		●
F100 turbofan engine (F-16, F-15)	●								●	●	
F119-PW-100 turbofan engine (F-22)	●				●		●				●
F117-PW-100 turbofan engine (C-17)	●	●		●		●		●			
PW4062 turbofan engine (KC-46)											
PT6A turboprop engine (EMB-314, T-6, PC-21, HeronTP)		●	●		●					●	
T900 turboshaft engine (AH-64, UH-60)		●									
Auxiliary power units											
APU (V-22, CH-53K, UH-60, CH-47, F-16, A400M, KC-390)											
Systems and equipment											
SYERS-2, SYERS-3, DB-110, MS-177 multispectral imaging sensors											
TERPROM digital terrain system											
Landing gears (F-15, C-17, AH-64E)											
Wheels & carbon brakes (F-15, C-130)											
Propeller systems** (A400M)											
PRC-162 software-defined ground radio											

*General Electric

**Produced by French Ratier-Figeac subsidiary

STRATEGIC HIGHLIGHTS

Business trends

- ▶ United Technologies Corporation (UTC) is a U.S.-based conglomerate that includes Pratt & Whitney (aircraft engines), Otis (elevators and escalators), Carrier (heating and cooling solutions) and Collins Aerospace Systems (aircraft equipment, formerly Rockwell Collins, acquired in November 2018).
- ▶ UTC reported sustained growth in 2018 (+11.4%), with revenue reaching \$66.5bn (€56.3bn). The Pratt & Whitney branch posted the strongest performance, with 14% organic growth. UTC's other division involved in defence activities, Collins Aerospace Systems, also posted solid growth (+8% organic growth).
- ▶ In June 2019, UTC and Raytheon announced an agreement for an all-share merger of equals that should be completed during the first half of 2020. With combined revenues of approximately \$74bn (€62.7bn) in 2019, the new structure renamed Raytheon Technologies Corporation would become the world's second-largest defence group by revenues behind Lockheed Martin. Otis and Carrier, UTC divisions, are expected to be separated as part of the merger process. However, the transaction remains subject to the approval of U.S. competition authorities.
- ▶ The group continued to expand its industrial capacities, in particular with the extension of its international network of MCO service centres.

Home market

- ▶ UTC generated 58% of its revenue in the United States in 2018 (38% excluding re-exports). Sales to the U.S. Department of Defense, the Group's main customer, accounted for 11% of total revenue, or \$7.4bn (€6.3bn), an increase of 28% compared to 2017.
- ▶ In June 2019, the Department of Defense awarded Pratt & Whitney a \$3.2bn (€2.8bn) contract to produce 233 F135 engines for U.S. armed forces and international customers' F-35 fighter aircraft (56 for the U.S. Air Force, 10 for the U.S. Navy, 24 for the Marine Corps, 143 for international customers).
- ▶ In July 2019, Pratt & Whitney announced it had signed a 10-year agreement to supply new PT6A engines to Blackhawk Modifications Inc., a specialist in aircraft engine upgrades. More than 1,500 PT6A engines have been delivered to Blackhawk over the past 20 years.
- ▶ At the same time, Collins Aerospace received a sixth order from the U.S. Army for the supply of PRC-162 networked communications ground radios. The order is part of a \$12.7bn (€10.75bn) contract signed in 2016. UTC's aerospace division was also selected by the U.S. Army to participate as a systems integrator in the Future Vertical Lift program, which aims to develop a new family of military helicopters for the United States by 2030.

Export markets

- ▶ International sales accounted for 42% of revenue in 2018 and mainly concerned civil activities. In the military field, UTC benefitted from international demand for F135 engines, which power the F-35 Lightning II fighter aircraft.
- ▶ In 2019, Collins Aerospace completed the cockpit modernisation of the first of 14 Lockheed Martin C-130H Hercules aircraft for the French Air Force. The company was also selected by the Portuguese Air Force to upgrade its fleet of C-130H aircraft. Collins Aerospace's GPS anti-jamming system was also chosen by the Royal Canadian Navy.

Technology and Innovation

- ▶ UTC's R&D expenses amounted to \$4bn (€3.4bn) in 2018, representing 6% of revenue.

PROJECT TEAM (Xerfi MCI)

Marine Cassou (MCI Projects Manager)

Eline Maurel (Research Director)

Jérémy Robiolle (Head of Xerfi MCI)

STEERING COMMITTEE DGA/S2IE

Michel Midon, Valérie Latrémouille and Lorenzo Levera

LAYOUT & GRAPHICS

Xerfi MCI

DGA institutional website www.defense.gouv.fr/dga

State public procurement portal www.achats.defense.gouv.fr

The armaments portal www.ixarm.com

French defence procurement agency (DGA)

Industrial Affairs and Economic Intelligence Department

60, bd du général Martial Valin - CS 21 623 - 75 509 Paris Cedex 15

xerfi | MCI

