

BOARDING PASS



NAME OF PASSENGER:
URTEKO TXOSTENA

DEPARTURE:
Annual Report

ARRIVAL:
INFORME ANUAL

FLIGHT: Ready for a Reliable Future
DATE:
TIME:

GATE: **2020**



The Aeronautics and Space Cluster Association of the Basque Country - HEGAN is...



...Member of



...Member of



...Member of



...Member of



...Collaborator of



...Registered at





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1. Presentation of the 2020 Annual Report



It is time to present the Cluster's Annual Report for another year. This year, for the first time in many years, with figures that none of us would have liked to see and that we would not have imagined after more than 20 years on a path of growth.

In last year's Annual Report, we presented record numbers with 15,000 people employed in Cluster companies. It was already 2020 when we were editing and publishing that Annual Report, and we could foresee a crisis from which we have not yet recovered. In this 2020 Annual Report, we present figures that reflect a 28% reduction in turnover from the 2019 financial year but, despite this, 13,766 people remained employed by this Cluster during the past year.

We can therefore say that the entities that make up the Basque Country Aeronautics and Space Cluster – HEGAN, have made a great effort to keep people (that is: talent and knowledge) on, despite the terrible decline in activity. At the same time, we are striving to ensure our competitiveness in a more sustainable future and to promote recovery.

Because recovery is on its way. The need to fly will come back; connecting, meeting, learning, relating, working and the need for entrepreneurship cannot be replaced. This recovery will be accompanied by new, more efficient and sustainable aircraft; a new paradigm in the Sector, to which we must all contribute. With this vision, and thinking of the recovery, the Basque industry is committed to diversification, internal improvement, the integration of supply and the commitment to R&D and innovation, fundamentally understood as digitisation and sustainability.

It is time to take initiatives to support the aviation sector, preferably applied to industrial projects that ensure continued economic growth in the medium and long term. We recall the important role of the sector as an inducer of technical development and a vector of technological transfer to other sectors at a time when innovation is key to the recovery of the economy as a whole. For this reason, we claim our role as a key strategic sector as a source of value creation for society, of quality employment and of R&D&I stimulation. We are part of the solution in the fight against climate change as a developer of clean technologies for the future.

We are already working on this path of sustained and sustainable growth.

Carlos ALZOLA ELIZONDO
Chairman of HEGAN

1. 2020ko Urteko Txostenaren aurkezpena

Iritsi da berriro ere Klusterraren Urteko Txostena aurkezteko unea. Aurten, azken urte askoan ez bezala, inork ikusi nahi ez genituen zifrak ditugu aurrean, 20 urte baino gehiagoan izan dugun hazkunde-ibilbide horretan inork imajinatuko ez genituen zifrak, hain zuzen.

Iazko Urteko Txostenean, errekorrezko zifrak aurkeztu genituen: 15.000 lagun ari ziren lanean klusterreko enpresetan, esaterako. Dagoeneko 2020. urtea zen Urteko Txostena editatzen eta argitaratzen ari ginenean, eta ordurako jada ikus genezakeen krisia, oraindik gaintu ez duguna. 2020ko Urteko Txosten honetan, 2019ko ekitaldiarekin alderatuta % 28ko murrizketa islatzen duten zifrak aurkeztu ditugu, baina, hala ere, iaz 13.766 langile aritu dira lanean klusterrean.

Beraz, esan dezakegu HEGAN Euskadiko Aeronautika eta Espazioko Klusterra osatzen dugun erakundeok ahalegin handia egin dugula pertsoneri (hau da, talentuari eta ezagutzari) eusteko, nahiz eta jarduera izugarri jaitsi den. Aldi berean, lanean ari gara etorkizun iraunkorrago batean gure lehiakortasuna bermatzeko eta susperraldia bultzatzeko.

Susperraldia bidean baita. Hegan egiteko beharra itzuliko da; konektatzea, biltzea, ikastea, harremanak izatea, lan egitea eta ekitea ezin dira ordezkatu. Eta susperraldi horrekin batera, hegazkin eraginkorragoak eta iraunkorragoak izango ditugu; paradigma berria izango da sektorean, eta guztiok esku hartu behar dugu. Ikuspegi horrekin, eta susperraldi horri begira, euskal industriak dibertsifikazioaren, barne-hobekuntzaren, eskaintzaren integrazioaren eta I+G eta berrikuntzaren aldeko apustua egin nahi du, batez ere digitalizazioa eta iraunkortasuna kontuan hartuta.

Aeronautikaren sektorea babesteko ekimenak abian jartzeko unea da, batez ere epe ertain eta luzerako hazkunde ekonomiko jarraitua bermatzen duten industria-proiektuei aplikatutako ekimenak. Gogoan izan behar dugu sektoreak garapen teknikoaren eragile gisa eta beste sektore batzuetarako transferentzia teknologikoaren bektore gisa duen garrantzia, une honetan berrikuntza funtsezkoa baita oro har ekonomia suspertzeko. Horregatik, funtsezko sektore estrategiko gisa dugun zeregina aldarrikatzen dugu, gizartearentzat balioa sortzeko, kalitatezko enplegua sortzeko eta I+G+b dinamizatzeko iturri garen heinean. Irtenbidearen parte gara klima-aldaketaren borrokan, etorkizuneko teknologia garbien garatzaileak baikara.

Dagoeneko ari gara lanean, etengabeko hazkunde iraunkorraren bide horretan.

Carlos ALZOLA ELIZONDO
HEGANeko lehendakaria

1. Presentación Informe Anual 2020

Es momento de presentar un año más el Informe Anual del Cluster. Este año, por primera vez desde hace muchos, con unas cifras que a ninguno nos hubiera gustado ver y que tampoco hubiéramos imaginado después de más de 20 años en la senda del crecimiento.

En el Informe Anual del pasado año, presentábamos cifras récord con 15.000 personas empleadas en las empresas del Cluster. Era ya 2020 cuando estábamos editando y publicando aquel Informe Anual, y podíamos vislumbrar una crisis de la que aún no nos hemos recuperado. En este Informe Anual 2020, presentamos unas cifras que reflejan una reducción de la facturación del 28% respecto al ejercicio de 2019 pero, a pesar de ello, se han mantenido 13.766 personas empleadas en este Cluster durante el pasado año.

Podemos decir, por tanto, que las entidades que conformamos el Cluster de Aeronáutica y Espacio del País Vasco – HEGAN, hemos hecho un gran esfuerzo por mantener las personas (es decir, el talento y el conocimiento) a pesar de la terrible bajada de actividad. Al mismo tiempo, trabajamos para asegurar nuestra competitividad en un futuro más sostenible y promover la recuperación.

Porque la recuperación está de camino. La necesidad de volar volverá; conectar, reunirse, aprender, relacionarse, trabajar y emprender no pueden substituirse. Esta recuperación vendrá acompañada con nuevos aviones más eficientes, y sostenibles; un nuevo paradigma en el Sector, al que tenemos que contribuir entre todos. Con esta visión, y con vistas a esa recuperación, la industria vasca proyecta apostar por la diversificación, la mejora interna, la integración de la oferta y la apuesta por la I+D y la innovación, fundamentalmente entendida como digitalización y sostenibilidad.

Es el momento de adoptar iniciativas para apoyar el sector aeronáutico, preferentemente aplicadas a proyectos industriales que garanticen crecimiento económico continuado a medio y largo plazo. Recordamos el relevante papel del sector como inductor de desarrollo técnico y vector de transferencia tecnológica a otros sectores, en un momento en el que la innovación resulta clave para la recuperación de la economía en su conjunto. Por esta razón, reivindicamos nuestro papel de sector estratégico clave como fuente de creación de valor para la sociedad, de empleo de calidad y dinamización de I+D+i. Somos parte de la solución en la lucha contra el cambio climático como desarrollador de tecnologías limpias de futuro

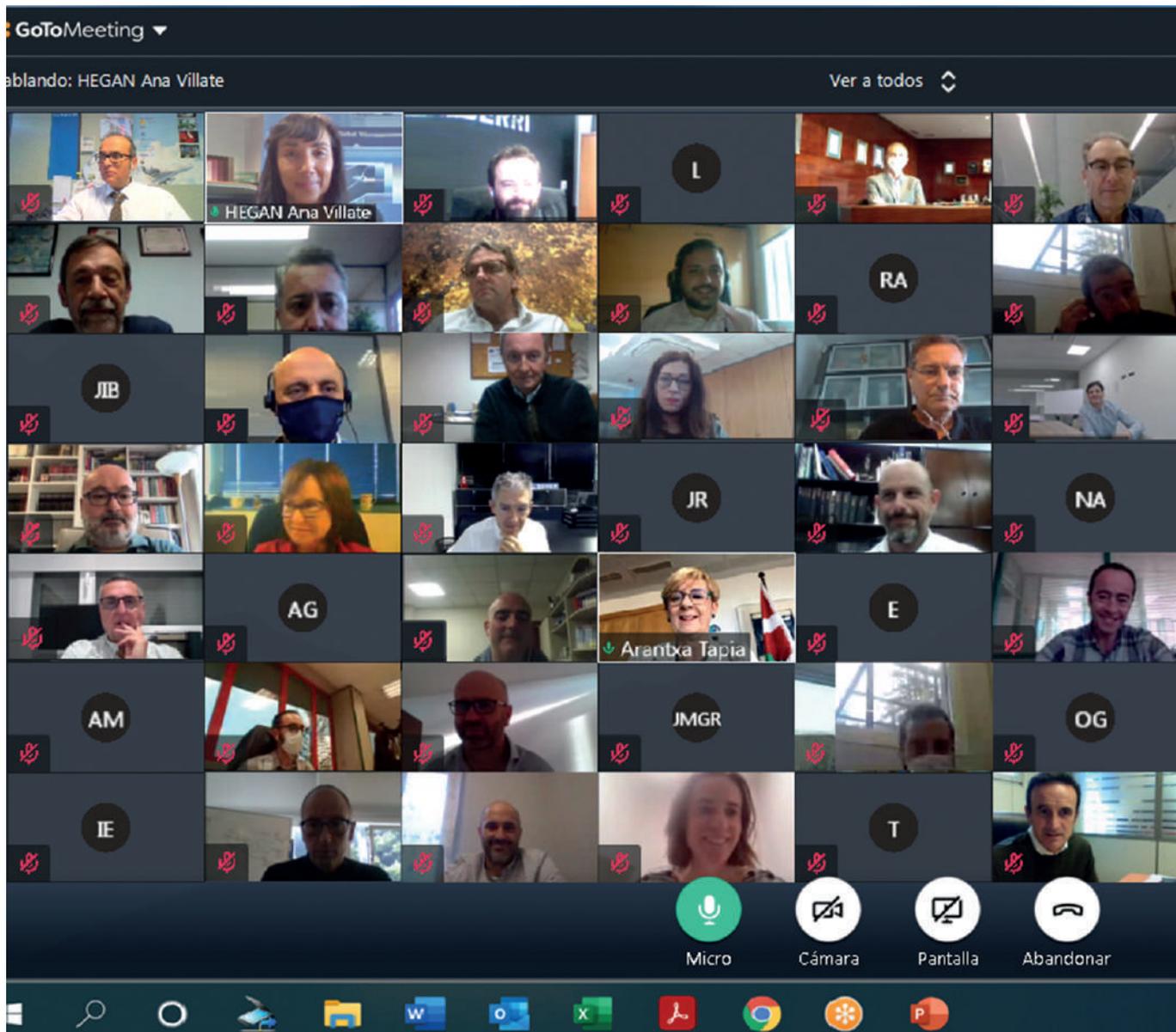
Estamos trabajando ya en esta senda de crecimiento sostenido y sostenible.

Carlos ALZOLA ELIZONDO
Presidente de HEGAN

2. THE CLUSTER ASSOCIATION

THE CLUSTER ASSOCIATION

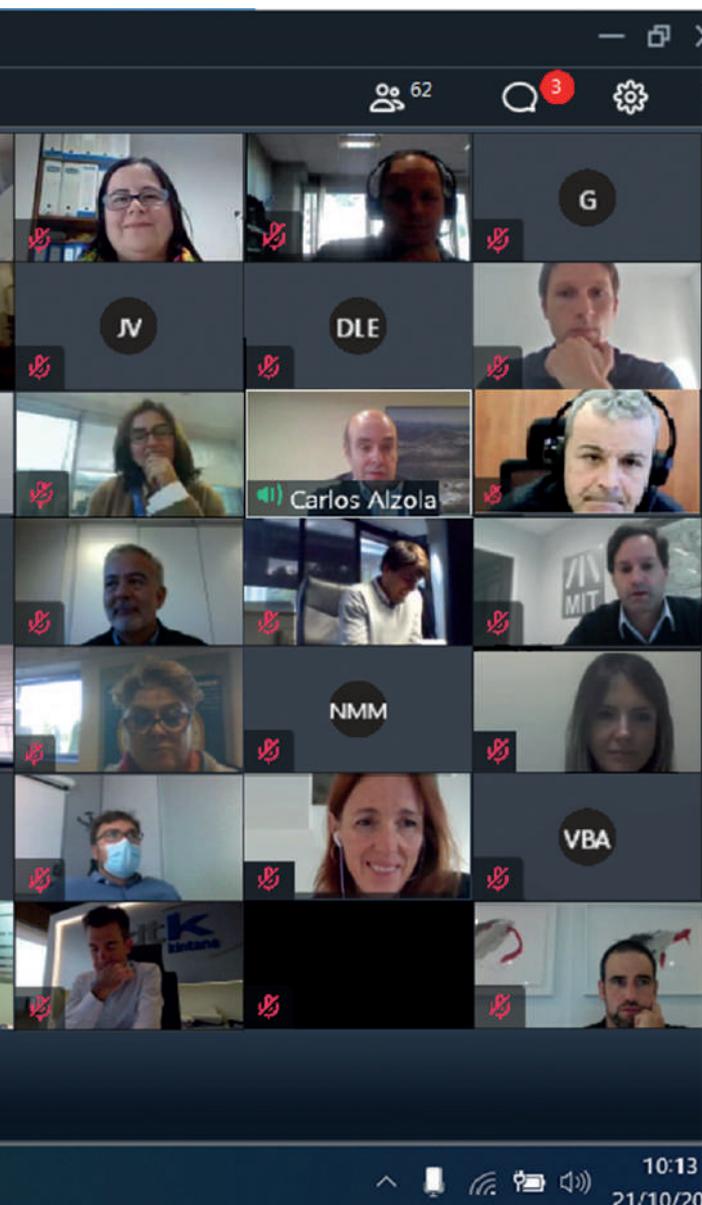
HEGAN is a private non-profit association that brings together the Basque Aeronautics and Space Sector, created with the mission of representing and revitalising the sector, to facilitate its competitiveness in the short-, medium- and long-term through cooperation and innovation between companies and other agents, responding cooperatively to its strategic challenges.



General Assembly 2020... first virtual ever...

GENERAL ASSEMBLY

This is the highest-ranking body of the Association. It is made up of all member companies and is the forum through which they can express their wishes.



BOARD OF DIRECTORS

This is the collegiate administration and management body. Its current members, appointed by the General Assembly, are:

Carlos ALZOLA

Chairman, ITP AERO

Karlos BALSATEGI

Vice-Chairman, ARATZ

José Julián ECHEVARRIA

Secretary/ Treasure SENER AEROESPACIAL

Ricardo CHOCARRO

AERNNOVA

Iñaki ASTORKIA

ASTORKIA AERO COMPONENTS

Jon PARDO

BURDINBERRI

Íñigo EZQUERRA

CAPGEMINI ENGINEERING

Ignacio EIRIZ

CTA

Gonzalo ORBEA

EIPC

José AMORES

MIZAR ADDITIVE

Javier FDEZ. DE RETANA

Guest, AERNNOVA

Plácido MÁRQUEZ

Guest, ITP AERO

Javier VIÑALS

Guest, SENER AEROESPACIAL

Susana LARREA

Guest, SPRI / BASQUE GOVERNMENT

Aitor COBANERA

Guest, SPRI / BASQUE GOVERNMENT

HEGAN TEAM:

Mentxu DÍAZ, Administration

Martín FDEZ. LOIZAGA, Deputy Director

Ana RODRÍGUEZ, Head of Operations

Ana VILLATE, Managing Director

HEGAN activities 2020

Since we started to implement the strategic challenges of our Strategic Plan 2017-2020 (PE1720), efforts have been made to revitalize and dynamize groups of Members with shared interests in areas, mainly, of Technological Development, Non-technological Development and Internationalization; without ever forgetting the Competitive Intelligence, nor the Training of the people, nor the representation and defence of the Cluster. This is always with the aim of supporting the improvement of competitiveness through cooperation. This is how we work till now:



*In 2020 we worked on HEGAN Strategic Plan 2021-2024 (PEH2124)
... with new challenges and vectors...*

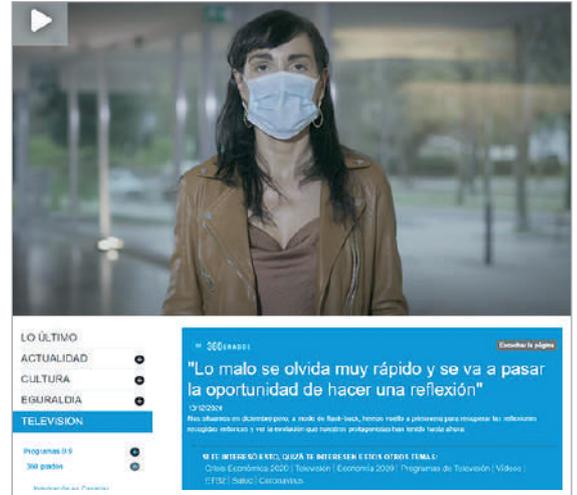


hegan 
SICC Sistema de Inteligencia Competitiva Cluster



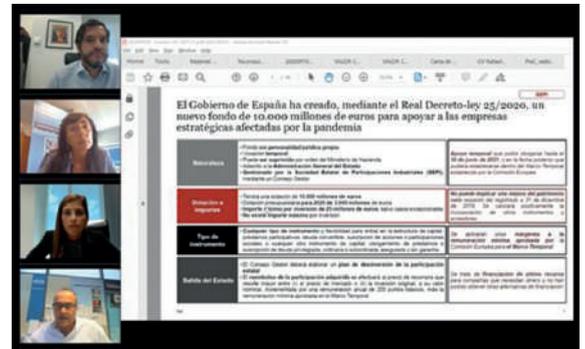
#1 Development of the Value Chain

Innovation Committee
 EJGV Smart Industry Strategy Contrast
 Projects: Identification, Proposals,
 Participation...
 Technological webinars (Move 4.0,
 Blockchain ...)
 AeroTrends Conferences...



#2 Knowledge Development

Pandemic Webinar-Cycles
 Competitive Intelligence (SICC)
 AeroAcademy
 Relations with the academic world...



#3 Internationalisation

Annual Report, Web, Catalogs...
 Missions, B2Bs, Shows... ALL virtual...

#4 Communication

Press releases, Media... Government
 relations...





Working hard for a reliable future...



The Aeronautical and Space Sector is strategic and key to the economy of a country since it is a creator and generator of highly qualified direct employment, in addition to having indirect and induced job creation rates that, in the most prudent of studies, multiply by four to direct employment; insofar as it is technology-intensive, it is a vector of scientific and technical transfer to other sectors and industries; and as a developer of high value-added products and services.

The need to fly will return. Connecting, meeting, meeting, traveling, learning, relating, escaping, working and undertaking cannot

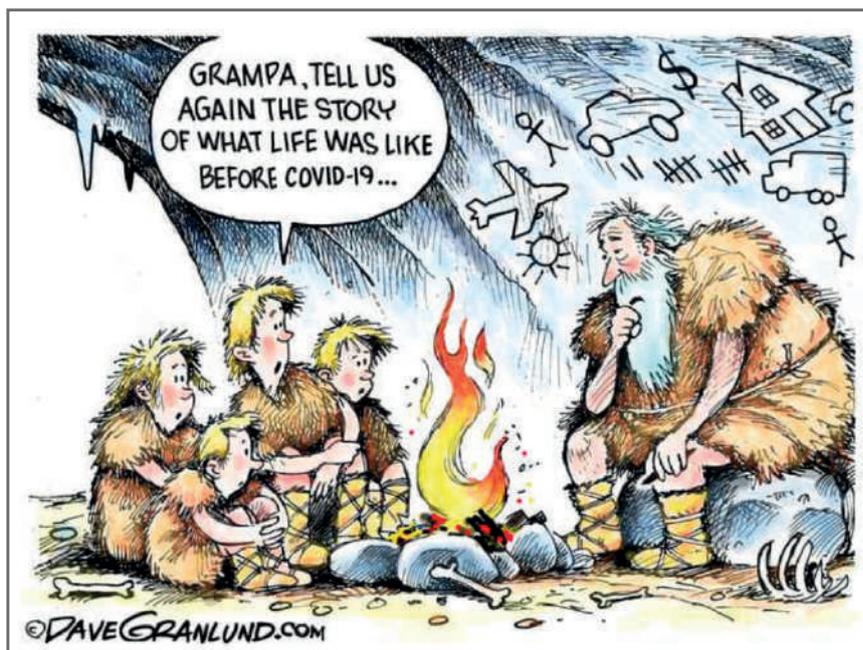


be substituted for a screen or a webcon. And this recovery will come with new paradigms: efficient, clean, neutral, sustainable airplanes ...

The Sector is not alien to a cleaner world but has been a bulwark in this fight: for more than twenty years, the Aerospace Industry has imposed higher environmental demands on itself than any other sector. And it has succeeded: today, airplanes are more efficient than a few decades ago, emitting between -68% less noise on average and -32% CO2 and -40% NOx per passenger than the models of the last century.

The Sector is part of the solution (decarbonisation, electrification, 0 emissions...) as a developer and demonstrator of clean technologies aligned, therefore, with the Sustainable Development Goals (SDG).

Our Sector is basic and essential to avoid this:



3. THE CLUSTER MEMBERS

▣▣ Basque Aerospace Value Chain

▣▣ Members

▣▣ Members Activities 2020

Aerostructures

Engines

Systems & Equipment

Space

MRO

RTD Projects

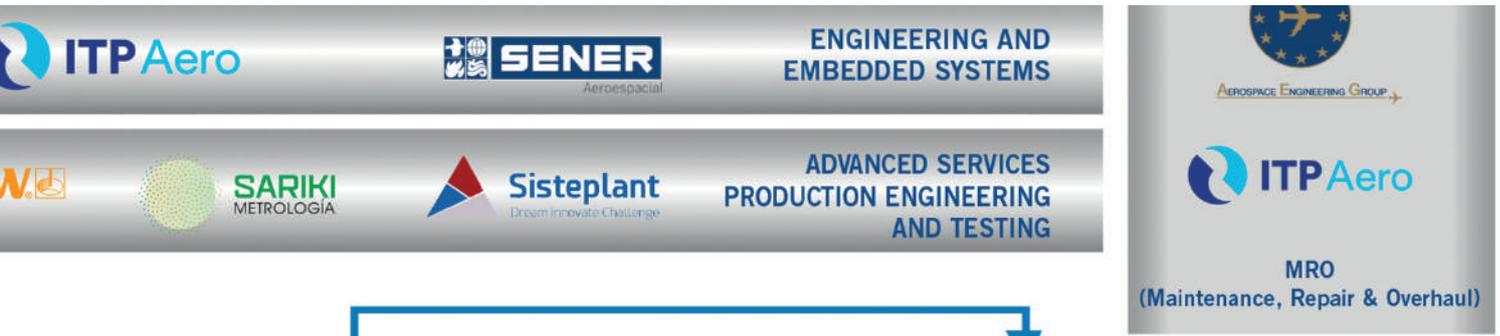
▣▣ Facts & Figures 2020



Basque Aerospace Value Chain



A competitive Value Chain, made up by 68 Members that cover the complete Product-cycle



Members

AERNNOVA 	ITP AERO 	SENER AEROESPACIAL 	AALBERTS S. T. TEY 
ANTERAL  <small>Innovative Antennas, Passives & Radar Technologies.</small>	ARATZ 	ASTORKIA 	AYZAR 
DOILAN  <small>Committed to Precision</small>	DTK 	DYFA 	EGA MASTER 
EUROUTIL 	EYHER 	GRUPO TTT 	INDUSTRIAS GALINDO 
MATRICI 	MESIMA 	METALURGICA MARINA 	MET-MEKA 
ONA ELECTROEROSION  <small>WE ARE EDM</small>	RENISHAW 	SARIKI METROLOGÍA 	SATLANTIS 
TM TELLERIA 	WEC 	WOLCO 	XUBI ENGRANAGES 
TEKNIKER  <small>MEMBER OF BASQUE RESEARCH & TECHNOLOGY ALLIANCE</small>	UNIV. DE DEUSTO  <small>Universidad de Deusto Deustuko Unibertsitatea</small>	UPV/EHU  <small>BILBOKO INGENIARITZA ESKOLA ESCUELA DE INGENIERÍA DE BILBAO</small>	MONDRAGON UNI.  <small>Go! Eskola Politeknikoa Escuela Politécnica Superior</small>
ERNST AND YOUNG 	HERRERO Y ASOCIADOS 	LABORAL KUTXA 	ZENTRALCOM 

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Key Partners for a Reliable FUTURE...

ACITURRRI 	AEROMEC 	AEROSPACE ENG. GR. 	AIBE
BATZ 	BURDINBERRI 	CAPGEMINI ENG. 	DANOBTGROUP
EGILE 	EIBAR PRECISION CASTING 	EKIN 	ELECTROHILO
KHEGAL AERONAUTICA 	KORTA 	LAZPIUR 	LTK GRUPO
METRALTEC 	MICROLAN AEROSPACE 	MIZAR ADDITIVE 	NUTER
SIKULAN 	SISTEPLANT 	TAES 	TECNASA
CIDETEC 	CTA 	LORTEK 	TECNALIA
TECNUN 	ALBIA CAPITAL 	C2B 	COMPITTE

> Industry
> Universities

> R&D. Org
> Allies



Members Activities

3.1. Aerostructures

General Description of the Product/services	DIRECT CLIENT
AERNOVA	
Large and Complex Machined parts and Assemblies	SPIRIT
Design of Swing zone & Latching mechanism	BOIENG
Engineering of Wing box, Spars & Stringers	BOIENG
Engineering of Spoilers, Ailerons & Fuselage Sect 42	BOIENG
Large and Complex Machined parts and Assemblies	SPIRIT
Engineering support to Center Wing Box and Wing ribs optimization	BOIENG
Floor assembly & Mid-cabin assembly	BELL
Forward fuselage assembly & Tailboom	BELL
Design and Build Center Wing Box & Tail Cone	AIRBUS
Engineering support to front and mid fuselage	AIRBUS
MGL Doors & Elevators	AIRBUS
Cabin interiors: "Dado" panels	AIRBUS
MLG Doors	AIRBUS
Elevator components	AIRBUS
Karman fairings	AIRBUS
Design and Build Rear upper fuselage & Dorsal fin	AIRBUS
Design and Build Fish Tail & VTP fairing	AIRBUS
Design and Build of Wing fixed Traiting Edge & Elevators	AIRBUS
Design and Build of HTP & MLG Bay Bulkhead	AIRBUS
Rudder & Aii inlet bulkhead	AIRBUS
Pax. Doors & Pylon Spar (composite)	AIRBUS
Design and Build Sect. 19	AIRBUS
Design and Build Horizontal Stabilizer	AIRBUS
Ailerons Skins & Sect.19-19.1 pannels assembly	AIRBUS
HTP Ribas & Engine cowlings	AIRBUS DS
Metallic parts & FAL Support	AIRBUS DS
Engine cowlings Assy & NLG Doors & Elevators	AIRBUS DS
Design and Build Horizontal & Vertical Stabilizers	EMBRAER
Forward fuselage	EMBRAER
Design and Build of Coplete Empenng and Rear Fuselage	EMBRAER
Design and Build of Flare Dispenser	EUROFIGHTER
Rear fuselage skins	AIRBUS HELICOPTERS
Tail boom, lower & upper struture (floor to floor)	AIRBUS HELICOPTERS
Components & assemblies	AIRBUS HELICOPTERS
Design and Build Wing movables & Rudder	EMBRAER
HTP Composite components	EMBRAER
Design of Rear fuselage I and II & Cargo Ramp and Door	EMBRAER
Detail design of Wing Main Box and Pylon	EMBRAER

	OEM	PLATFORMS
	BOIENG	737NG / MAX
	BOIENG	747 LCF
	BOIENG	747-8 I/F
	BOIENG	747-8 I/F
	BOIENG	777
	BOIENG	787
	BELL	505 JET / RANGER X
	BELL	505 JET / RANGER X
	AIRBUS	A220
	AIRBUS	A220
	AIRBUS	A320
	AIRBUS	A320
	AIRBUS	A330
	AIRBUS	A330
	AIRBUS	A330
	AIRBUS	A330XL Beluga
	AIRBUS	A330XL Beluga
	AIRBUS	A350XWB
	AIRBUS	A380
	AIRBUS	A380
	AIRBUS	A380
	AIRBUS DS	A400M
	AIRBUS DS	A400M
	AIRBUS DS	C295/CN235
	EMBRAER	E2
	EMBRAER	E2
	EMBRAER	EMB170/190
	EUROFIGHTER	EUROFIGHTER TYPHOON
	AIRBUS HELICOPTERS	H135
	AIRBUS HELICOPTERS	H225 SUPER PUMA
	AIRBUS HELICOPTERS	H225 SUPER PUMA
	EMBRAER	KC-390

3.1. Aerostructures

General Description of the Product/services	DIRECT CLIENT
AERNNOVA (cont.)	
Engineering support to HTP, VTP and Passenger doors	BOMBARDIER
Rear fuselage & Tail boom	LEONARDO
Front fuselage composite panels	LEONARDO
Design and engineering of Complete and Equipped wings	PILATUS
Design and build of Rear fuselage / Aft transition tailcone	SIKORSKY
Rear fuselage & Horizontal stabilizer skins & components	AIRBUS HELICOPTERS
AALBERTS SURFACE TECHNOLOGIES TEY	
Heat treatments	AIRBUS DS
Heat treatments	CESA
Heat treatments	ACITURRI
Heat treatments	EMBRAER
Heat treatments	AERNNOVA
Heat treatments	AERNNOVA
Heat treatments	CESA
ACITURRI	
Rudder Components & Subassembly	AIRBUS DS
CFRP Flaperon Skins & Flaperon & Aileron	AIRBUS DS
S46 Passenger door surround	AIRBUS DS
Keel Beams CFRP Parts cargo floor	BOEING
FLAPERONS CFRP PANELS	BOEING
HTP Tips & Strakelet	BOEING
Winglet & Wingstub	EMBRAER
VTP Dorsal Fin & HTP Torsion box	AIRBUS OPERATIONS
Leading edge panels and LEX of HTP	AIRBUS OPERATIONS
TIP's HTP and Leading Edges HTP & VTP	AIRBUS
TTP's	AERNNOVA
Leading edge of HTP assembly & TIP's HTP	AIRBUS DS
Passenger door structural assembly	ALESTIS
CFRP Spar Outboard Aileron	AIRBUS OPERATIONS
PAX Door & Ribs HTP	AIRBUS
Wing Assembly Conversion	AIRBUS DS
PAX Door & Ribs HTP	AIRBUS
VTP & Internal structure of S19	AIRBUS OPERATIONS
Outboard FLAP CFRP parts (V1000)	FOKKER-GKN
Belly Fairing - Risk Partner	AIRBUS
S19.1 - Risk Partner	AIRBUS
Belly Fairing (Zones 0,1, 2, 3.1, 3.2, 3.3 y 4)	AIRBUS DS
HTP Ribs	AIRBUS OPERATIONS

	OEM	PLATFORMS
	BOMBARDIER	LEARJET 85
	NH INDUSTRIES	NH-90
	NH INDUSTRIES	NH-90
	PILATUS	PC24
	SIKORSKY	S-92/H-92
	AIRBUS HELICOPTERS	TIGRE
	AIRBUS DS	AIRBUS DS families
	AIRBUS	AIRBUS families
	AIRBUS	AIRBUS families
	EMBRAER	KC-390
	FOKKER	Miscellaneous
	SIKORSKY	S-92
	SIKORSKY	S-92
	BOEING	737
	BOEING	777
	BOEING	777
	BOEING	787
	BOEING	787
	BOEING	787
	EMBRAER	190/195
	AIRBUS	A320
	AIRBUS	A320
	AIRBUS	A320 & A320neo
	AIRBUS	A320 & A320neo
	AIRBUS	A330
	AIRBUS	A330MRTT
	AIRBUS	A330neo
	AIRBUS	A350 XWB
	AIRBUS	A380
	AIRBUS	A380

3.1. Aerostructures

General Description of the Product/services	DIRECT CLIENT
ACITURRI (cont.)	
Rudder & Elevators	AIRBUS OPERATIONS
S19.1 CFRP Omegas	AIRBUS OPERATIONS
S19.1 Ducts & Housing	AIRBUS OPERATIONS
MLGD / S19.1 / Rear Fairing	AIRBUS
Belly Fairing (Structure)	AIRBUS DS
Auxiliary Fin & HTP Box Extension	DAHER-SOCATA
Ventral Fin	AIRBUS FRANCE
Sponsons	AIRBUS GERMANY
Wing to Fuselage Fairing	AIRBUS FAL San Pablo
Elevator & Cowlings	AIRBUS DS
Auxiliary Fin & HTP Box Extension & Ventral Fin	AIRBUS OPERATIONS
CFRP Rudder Spar	AIRBUS OPERATIONS
Flap CFRP parts and Vane	AIRBUS OPERATIONS
Central Box: structural assembly and equipment & Tip wings integration	AIRBUS DS
Rear fuselage & HTP/VTP	AIRBUS DS
Elevators & HTP Parts	AIRBUS DS
Ailerons	FOKKER-GKN
Wing to Fuselage Fairing	EMBRAER
Central Fuselage	EMBRAER
Empennage & Wings	EMBRAER
Composite parts	EMBRAER
Sponsons and Vertical Tail	FOKKER-GKN
CFRP Fairings	AIRBUS DS
AEROMECC	
Structural door components.	Several
Door structural components	Several
Wing ribs structure	Several
Pilon Rib	Several
Wing ribs structure	Several
ARATZ	
Composite Tooling	AIRBUS
Lay Up Tooling	AIRBUS
Assembly tooling	AIRBUS
Composite Tooling	BOMBARDIER
Assembly tooling	DASSAULT
Composite Tooling	DASSAULT
ASTORKIA	
Machined Components	Several

	OEM	PLATFORMS
	AIRBUS	A380
	AIRBUS	A400M
	AIRBUS	BELUGA XL
	AIRBUS	BELUGA XL
	AIRBUS	BELUGA XL
	AIRBUS	CN235, C295
	AIRBUS	CN235, C295
	DASSAULT	FALCON 7X
	DASSAULT	FALCON 7X
	EMBRAER	KC-390
	EMBRAER	LEGACY450/500
	EMBRAER	LEGACY450/500
	EMBRAER	LEGACY450/500
	AIRBUS HELICOPTERS	NH90
	EUROFIGHTER	TYPHOON
	BOEING	787
	EMBRAER	170/175/190/195/E2
	AIRBUS	350XWB
	AIRBUS	A320
	AIRBUS	A330
	AIRBUS	A350 XWB, A321XLR
	AIRBUS	A350 XWB, A321XLR
	AIRBUS	AIRBUS families
	BOMBARDIER	Cseries CS100-A220
	DASSAULT	Falcon family
	DASSAULT	Falcon family
	BOEING	747 / 787

3.1. Aerostructures

General Description of the Product/services	DIRECT CLIENT
ASTORKIA (cont.)	
Machined Components	AERNNNOVA
Machined Components	AERNNNOVA
Machined Components	AERNNNOVA
AYZAR	
Heat treatments	ACITURRI
BURDINBERRI	
S19 curing tool	AIRBUS
CIDETEC	
Surface preparation	AERNNNOVA
Reprocessability, Repairability and Recyclability of composites	AERNNNOVA
CTA	
Fire certification tests of interior materials	AIR NOSTRUM LAM
Fire certification tests of interior materials	DIEHL AEROSPACE
Fire certification tests of interior materials	IACOBUCCI HF AEROSPACE
Fire certification tests of interior materials	HUTCHINSON-CR
Fire certification tests of interior materials	COMPOSITE INDUSTRIES
Fire certification tests of interior materials	PMV INDUSTRIES
Fire certification tests of interior materials	JCB AERO
Fire certification tests of interior materials	INDUSTRIAL NEO-TEX
Fire certification tests of interior materials	PINTA INSULATION
Fire certification tests of interior materials	VELCRO EUROPE
Fire certification tests of interior materials	ROMTEX ANJOU AERONAUTIQUE
Fire certification tests of interior materials	SN CENTRAIR
Fire certification tests of interior materials	DESSO
Fire certification tests of interior materials	BOEING R&T EUROPE
E2 Horizontal Stabilizer Fatigue Test	AERNNNOVA
E2 Flap Supports Structural Test	ASCO INDUSTRIES
Rotor blade tests	DAHER
Tail boom frame tests	DAHER
Wing structural tests	HAL
HTP tests	DAHER
Tail cone tests	DAHER
DTK	
Landing gear trap components	AERNNNOVA
Stabilizer components	AERNNNOVA
DYFA	
Tooling for Aeronautical manufacturing	AIRBUS
Machining of components	ACITURRI

	OEM	PLATFORMS
	AIRBUS	AIRBUS families
	BOMBARDIER	CRJ700/900
	EMBRAER	EMBRAER families
	AIRBUS	AIRBUS families
	AIRBUS	A350 XWB
	AIRBUS	AIRBUS families
	AIRBUS	AIRBUS families
	Several	Airliners
	BOEING	Airliners
	EMBRAER	E-Jets E2
	EMBRAER	E-Jets E2
	AIRBUS HELICOPTERS	H145
	AIRBUS HELICOPTERS	H145
	AIRBUS HELICOPTERS	RACER
	DAHER	TBM
	DAHER	TBM
	AIRBUS	A320
	AIRBUS	A350XWB
	AIRBUS	A320/330/400M
	AIRBUS	A350XWB

3.1. Aerostructures

General Description of the Product/services	DIRECT CLIENT
DYFA (cont.)	
Machining of Composite (Carbon fiber / Fiberglass) & Metallic components	AERNNNOVA
Tooling for aeronautical Assembly	AIRBUS
Machining of Composite (Carbon fiber / Fiberglass) & Metallic components	Several
Tooling for aeronautical Assembly	AIRBUS HELICOPTERS
EGAMASTER	
Special Hand-Tools for Aerostructures assemblies	AERNNNOVA
EIBAR PRECISION CASTING	
Secondary structure components	TAI
Fuel system components	AIRBUS
Secondary structure components	AIRBUS DS
Secondary structure components	AIRBUS DS
EUROUTIL	
Tooling for Fuselages and LGs	AUBERT&DUVAL
GRUPO TTT	
Heat and surface treatments	Several
Heat and surface treatments	SPIRIT
Heat and surface treatments	MITSUBISHI CORPORATION
Heat and surface treatments	ALESTIS
Heat and surface treatments	AIRBUS DS
Heat and surface treatments	SONACA
Heat and surface treatments	AERNNNOVA
Heat and surface treatments	BHR Helicopter
Heat and surface treatments	SONACA
Heat and surface treatments	Several
Heat and surface treatments	AERNNNOVA
Heat and surface treatments	SKF
Heat and surface treatments	PARKER
Heat and surface treatments	AERNNNOVA
INDUSTRIAS GALINDO	
Tooling manufacturing	ALESTIS
Tooling manufacturing	INESPASA
Tooling manufacturing	ALESTIS
Tooling manufacturing	AERNNNOVA
Tooling manufacturing	AERNNNOVA
Tooling manufacturing	ACITURRI
Tooling manufacturing	CTA

	OEM	PLATFORMS
	EMBRAER	ERJ170/190, KC-390
	DASSAULT	Falcon 7X
	Several	Miscellaneous
	AIRBUS HELICOPTERS	NH90
	Several	Miscellaneous
	AIRBUS	A320neo/ A330neo
	AIRBUS	A320neo/ A330neo
	AIRBUS DS	C235, C295
	AIRBUS DS	EUROFIGHTER TYPHOON
	Several	Miscellaneous
	BOEING	737 / 777 / 787
	AIRBUS	A220
	AIRBUS	A220
	AIRBUS	A400M/380
	AIRBUS DS	AIRBUS DS families
	AIRBUS	AIRBUS families
	AIRBUS	AIRBUS families
	AIRBUS HELICOPTERS	AIRBUS HELICOPTERS families
	BELL	Bell 505
	EMBRAER	EMBRAER families
	BHR Helicopter	F360/290
	DASSAULT	FALCON family
	EMBRAER	KC-390
	Several	Miscellaneous
	Several	Miscellaneous
	Several	Miscellaneous
	SIKORSKY	S-92
	BOEING	787
	AIRBUS	A350 XWB
	AIRBUS	A350 XWB
	AIRBUS	A380
	EMBRAER	E-JET family
	AIRBUS	Miscellaneous
	Several	Miscellaneous

3.1. Aerostructures

General Description of the Product/services	DIRECT CLIENT
KHEGAL AERONÁUTICA	
Elementary components Machining	Several
Elementary components Machining	AERNNNOVA
Elementary components Machining	Several
Fuselage Holders for assembly line and Tooling for test bench	Several
Elementary components Machining	Several
LTK GRUPO	
Special Aerospace Logistics: Transport, Stock, Handling, Quality control...	ALESTIS
Special Aerospace Logistics: Transport, Stock, Handling, Quality control...	AIRBUS DS
Special Aerospace Logistics: Transport, Stock, Handling, Quality control...	AIRBUS DS
Special Aerospace Logistics: Transport, Stock, Handling, Quality control...	AIRBUS
Special Aerospace Logistics: Transport, Stock, Handling, Quality control...	ALESTIS
Special Aerospace Logistics: Transport, Stock, Handling, Quality control...	AIRBUS DS
Special Aerospace Logistics: Transport, Stock, Handling, Quality control...	ALESTIS
MESIMA	
Materials management and supply	AIRBUS DS
METRALTEC	
Manufacture of elementary parts and assembly (sheet metal, machining, heat and surface treatments, painting)	AERNNNOVA
Manufacture and assembly of elements (Sheet metal working, machining, heat and surface treatments, painting)	AERNNNOVA
Manufacture and assembly of elements (Sheet metal working, machining, heat and surface treatments, painting)	ACATEC
Manufacture of elementary parts (sheet metal)	ALESTIS
Manufacture and assembly of elements (Sheet metal working, machining, heat and surface treatments, painting)	AERNNNOVA
Manufacture of elementary parts (machining)	KHEGAL AERONÁUTICA
Manufacture of elementary parts and assemblies (sheet metal, machining, heat treatments and surface treatments, painting)	AERNNNOVA
Manufacture of elementary parts and assemblies (sheet metal, machining, heat treatments and surface treatments, painting)	OGMA
Manufacture of elementary parts and assemblies (sheet metal, machining, heat treatments and surface treatments, painting)	MTORRES
Manufacture of elementary parts and assemblies (sheet metal, machining, heat treatments and surface treatments, painting)	AERNNNOVA
Manufacture of elementary parts (sheet metal, machining, heat treatment, surface treatment, painting)	AERNNNOVA
MICROLAN	
Precision Machining of components, Turning and Milling	Several

	OEM	PLATFORMS
	ATR	42/72
	AIRBUS	A220
	AIRBUS	AIRBUS Families
	AIRBUS	AIRBUS Families
	DASSAULT	Falcon Family
	BOEING	787
	AIRBUS DS	A330MRTT
	AIRBUS DS	A400M
	AIRBUS	AIRBUS families
	AIRBUS	AIRBUS families
	AIRBUS DS	CN235, C295
	EMBRAER	E-JET family
	AIRBUS DS	Miscellaneous
	AIRBUS	A220
	AIRBUS	A320
	AIRBUS	A320
	AIRBUS	A350XWB
	AIRBUS	A380
	AIRBUS	A380
	EMBRAER	EMBRAER families
	EMBRAER	KC-390
	Several	Miscellaneous
	SIKORSKY	S-92
	EUROFIGHTER	TYPHOON
	Several	Miscellaneous

3.1. Aerostructures

General Description of the Product/services	DIRECT CLIENT
NUTER	
Machined Components	AERNNOVA
RENISHAW IBÉRICA	
Positioning of carbon fibre parts in the machine tool before machining, avoiding the need of expensive tooling, in an automated cycle.	non disclosure
SISTEPLANT	
Manufacturing Execution System implementation - New features	ALESTIS
Brainstorming Factory of the Future	SPACE ASOC.
TAES	
Components Deep precision Drilling	MEUPE
Components Deep precision Drilling	AEROTECNIC
Components Deep precision Drilling	EPCO
Components Deep precision Drilling	KANTER
Components Deep precision Drilling	ACITURRI

	OEM	PLATFORMS
	AIRBUS	A220
	AIRBUS	A380
	EMBRAER	ERJ family / E-JET family
	SIKORSKY	S-92
	AIRBUS	Miscellaneous
	AIRBUS	A350XWB
	AIRBUS	Miscellaneous
	Several	Miscellaneous

3.2. Engines

General Description of the Product/services	DIRECT CLIENT
AALBERTS SURFACE TECHNOLOGIES TEY	
Heat treatments	ACITURRI
Heat treatments	ITP AERO
Heat treatments	DMP
Heat treatments	SAFRAN HELICOPTER ENGINES
Heat treatments	WEC
Heat treatments	SAFRAN AERO BOOSTERS
ACITURRI	
Belts	SAFRAN OIL SYSTEMS
Hub Compressor	SAFRAN AIRCRAFT ENGINES
Brackets	SAFRAN AIRCRAFT ENGINES
Fun Hub Frames	SAFRAN AIRCRAFT ENGINES
Lugs and Shrouds	SAFRAN AIRCRAFT ENGINES
Lugs and vanes	ITP AERO
Mounting Rings, Thermals and fittings	ITP AERO
Components	WEC
Housings	ITP AERO
Struts	ITP AERO
Hubs	ITP AERO
Irods	ITP AERO
End Fittings	SL ENGINEERING
Rings	ROLLS-ROYCE
Structures	ROLLS-ROYCE
Casings	ROLLS-ROYCE
Hubs	ITP AERO
Lugs and vanes & T.Match	ITP AERO
Housings	ITP AERO
Housings	ITP AERO
Hubs	ITP AERO
Lugs and vanes	ITP AERO
Lugs and vanes	ITP AERO
AEROMECH	
Support ring	Several
Engine TBH	Several
LPT rings	Several
Engine TBH	Several
Intermediate pressure Turbine	Several
Engine exhaust Zone.	Several
Turbine casing & Thermal	Several

OEM	ENGINE MODEL	PLATFORMS
ROLLS-ROYCE	TRENT 1000	BOEING 787
ROLLS-ROYCE	TRENT family	Miscellaneous
SAFRAN HELICOPTER ENGINES	Several	Miscellaneous
SAFRAN HELICOPTER ENGINES	Several	Miscellaneous
Several	Several	Miscellaneous
Several	Several	Miscellaneous
CFM INTERNATIONAL	LEAP 1A/1B, GTF	AIRBUS A320neo / BOEING 737 MAX
CFM INTERNATIONAL	LEAP 1A/B	Airbus A320neo / Boeing 737 MAX
CFM INTERNATIONAL	LEAP 1A/B	AIRBUS A320neo / BOEING 737 MAX
CFM INTERNATIONAL	LEAP 1A/B/C	Airbus A320neo / Boeing 737 MAX/Comac C919
CFM INTERNATIONAL	LEAP 1B	BOEING 737 MAX
EPI	TP400	AIRBUS A400M
EUROJET	EJ200	EUROFIGHTER TYPHOON
EUROJET	EJ200	EUROFIGHTER TYPHOON
GENERAL ELECTRIC	F414	BOEING F/A-18E/F
GENERAL ELECTRIC	GE90-115	BOEING 777
PRATT&WHITNEY	Several	Miscellaneous
PRATT&WHITNEY	Several	Miscellaneous
ROLLS-ROYCE	TRENT 1000	BOEING 787
ROLLS-ROYCE	TRENT 1000	BOEING 787
ROLLS-ROYCE	TRENT 500	AIRBUS A340
ROLLS-ROYCE	TRENT 700	AIRBUS A330
ROLLS-ROYCE	TRENT 7000	AIRBUS 330neo
ROLLS-ROYCE	TRENT 900	AIRBUS A380
ROLLS-ROYCE	TRENT XWB	AIRBUS A350XWB
CFM INTERNATIONAL	CFM56	AIRBUS A320 / BOEING 737
EPI	TP400	A400M
EUROJET	EJ200	EUROFIGHTER TYPHOON
PRAT & WHITNEY	PW1500G	AIRBUS A220
PRAT & WHITNEY	PW535	Cesna Citation & Embraer Phenom 300
ROLLS-ROYCE	TRENT XWB	AIRBUS A350XWB
Several	Several	Miscellaneous

3.2. Engines

General Description of the Product/services	DIRECT CLIENT
ARATZ	
Machined Components	ITP AERO
Machined Components	ITP AERO
ASTORKIA	
Machined Components	ITP AERO
Machined Components	ITP AERO
Machined Components	ITP AERO
BATZ	
Hot formed panels for special alloys	ITP AERO
Hot formed panels for special alloys	SALLEN
Hot formed panels for special alloys	WEC
Hot formed panels for special alloys	WEC
Hot formed panels for special alloys	WEC
BURDINBERRI	
Duct RTM curing tools	ACITURRI
CTA	
Aerodynamic Technology Acquisition Rig Programme	ITP AERO
DANOBATGROUP	
Vertical grinding Machine-Tools for aeroengine manufacturing	GENERAL ELECTRIC
EGAMASTER	
Torque control traceability and permit system	ITP AERO
Remote Asset localization system	ITP AERO
EGILE	
Carter parts	ITP AERO
Carter parts	ITP AERO
Engine actuation systems	HÉROUX-DEVTEK SPAIN
Main shaft Ge90	AUBERT&DUVAL
Heat Shields	ITP AERO
NGVs	ITP AERO
NGVs	ITP AERO
Boitiers Roulements	SAFRAN TRANSMISSION SYSTEMS
Fourreaux	SAFRAN TRANSMISSION SYSTEMS
Gears and shafts	SAFAN AERO BOOSTERS
Gears and shafts	SAFRAN HELICOPTER ENGINES
Main transmission gears	SAFRAN HELICOPTER ENGINES
Accessory transmission gears	SAFRAN HELICOPTER ENGINES
Shaft	ITP AERO
EIBAR PRECISION CASTING	
Castings Components	ITP AERO

OEM	ENGINE MODEL	PLATFORMS
ROLLS-ROYCE	TRENT 700	AIRBUS A330
ROLLS-ROYCE	TRENT 900	AIRBUS A380
EPI	TP400	AIRBUS A400M
ROLLS-ROYCE	TRENT family	All range
ROLLS-ROYCE	TRENT XWB	AIRBUS A350XWB
EPI	TP400	A400M
ROLLS-ROYCE	TRENT 7000	AIRBUS A330neo
ROLLS-ROYCE	TRENT XWB	AIRBUS A350XWB
ROLLS-ROYCE	TRENT 900	AIRBUS A380
ROLLS-ROYCE	TRENT 1000	BOEING 787
SAFRAN AIRCRAFT ENGINES	Several	Miscellaneous
Several	Several	Miscellaneous
CFM INTERNATIONAL	CFM56	AIRBUS A320 / BOEING 737
CFM INTERNATIONAL	LEAP 1A/B	AIRBUS A320neo / BOEING 737MAX
EUROJET	EJ200	EUROFIGHTER TYPHOON
GENERAL ELECTRIC	GE90	BOEING 777
PRAT & WHITNEY	PW1000G	AIRBUS A220/320neo
ROLLS-ROYCE	TRENT 1000	BOEING 787
ROLLS-ROYCE	TRENT XWB	AIRBUS A350XWB
SAFRAN AIRCRAFT ENGINES	LEAP 1A/1B	AIRBUS A320neo / BOEING 737MAX
SAFRAN AIRCRAFT ENGINES	LEAP 1A/1B	AIRBUS A320neo / BOEING 737MAX
SAFRAN AIRCRAFT ENGINES	LEAP 1A/1B	AIRBUS A320neo / BOEING 737MAX
SAFRAN AIRCRAFT ENGINES	M88	RAFALE
SAFRAN HELICOPTER ENGINES	ALL RANGE	Miscellaneous
SAFRAN HELICOPTER ENGINES	ALL RANGE	Miscellaneous
SAFRAN HELICOPTER ENGINES	MTR390-E	AIRBUS HELICOPTERS TIGRE
ITP AERO	TRENT 1000	BOEING 787

3.2. Engines

General Description of the Product/services	DIRECT CLIENT
EIBAR PRECISION CASTING (cont.)	
Castings Components	ITP AERO
Castings Components	ITP AERO
ELECTROHILO	
Inner vanes stubs machining (spark erosion) and Vanes edge cutting (wire)	ITP AERO
TEC segmentation	ITP AERO
Strut manufacture	ITP AERO
Edging of VANES and BCVs	ITP AERO
Separation Top Core Vane, Vanes erosion, Top Core Vane manufacture	ITP AERO
Segments wire-cut	ITP AERO
wire-cut, machininf and sheet-metal works	ITP AERO
Segments wire-cut	ITP AERO
EUROUTIL	
Tooling	SAFRAN
GRUPO TTT	
Heat and Surface treatments	ITP AERO
Heat and Surface treatments	ITP AERO
Heat and Surface treatments	SAFRAN AIRCRAFT ENGINES
Heat and Surface treatments	SAFRAN HELICOPTER ENGINES
Heat and Surface treatments	SAFRAN TRANSMISSION SYSTEMS
INDUSTRIAS GALINDO	
Design of Cutting Tools	SAFRAN AIRCRAFT ENGINES
Manufacturing of Tooling for LPT Components (inter stage seals)	ITP AERO
Manufacturing of Tooling for turbine shafts and static components	ITP AERO
Design of Cutting Tools	ITP AERO
Design of Cutting Tools	MECACHROME
ITP AERO	
Lost wax casting super alloys for Turbine	SAFRAN AIRCRAFT ENGINES
Lost wax casting super alloys for Turbine	MTU
Design and manufacture of low pressure turbine (LPT) - Member of EPI Consortium	AIRBUS DS
Design and manufacture of the Front Frame and Exhaust System - Member of the EPI Consortium	AIRBUS DS
Manufacture of Externals - Member of EPI Consortium	AIRBUS DS
Final assembly of engine - Member of EPI Consortium	AIRBUS DS
Lost wax casting super alloys for intermediate pressure turbine	ROLLS-ROYCE
Lost wax casting super alloys for the LPT	ROLLS-ROYCE
Design and manufacture of the Diffuser cones and By-Pass Module - Member of the EUROJET Consortium	NETMA

OEM	ENGINE MODEL	PLATFORMS
ITP AERO	TRENT XWB	AIRBUS A350XWB
ITP AERO	ULTRAFAN & PEARL700	Miscellaneous
EPI	TP400	AIRBUS A400M
EUROJET	EJ200	EUROFIGHTER TYPHOON
MTRI	MTR390-E	AIRBUS HELICOPTERS TIGRE
ROLLS-ROYCE	TRENT 1000 / 7000	BOEING 787 / AIRBUS A330 NEO
ROLLS-ROYCE	TRENT 900	AIRBUS A380
ROLLS-ROYCE	TRENT XWB	AIRBUS A350XWB
ROLLS-ROYCE	ULTRAFAN	Miscellaneous
ROLLS-ROYCE	ULTRAFAN	Miscellaneous
SAFRAN	Several	Miscellaneous
EUROJET	EJ200	EUROFIGHTER TYPHOON
ROLLS-ROYCE	Several	Miscellaneous
SAFRAN AIRCRAFT ENGINES	Several	Miscellaneous
SAFRAN HELICOPTER ENGINES	Several	Miscellaneous
Several	Several	Miscellaneous
CFM INTERNATIONAL	LEAP	AIRBUS A320neo / BOEING 737MAX
ROLLS-ROYCE	TRENT XWB	AIRBUS A350XWB
Several	Several	Miscellaneous
Several	Several	Miscellaneous
Several	Several	Miscellaneous
CFM INTERNATIONAL	CFM56	AIRBUS A320 / BOEING 737
EA	GP7000	AIRBUS A380
EPI	TP400	AIRBUS A400M
EUROJET	EJ200	EUROFIGHTER TYPHOON

3.2. Engines

General Description of the Product/services	DIRECT CLIENT
ITP AERO (cont.)	
Design and manufacture of the post burner duct and variable nozzle - Member of the EUROJET Consortium	NETMA
Manufacture of Externals - Member of the EUROJET Consortium	NETMA
Final assembly of the engine - Member of the EUROJET Consortium	NETMA
Lost wax casting super alloys - nozzle	NETMA
Lost wax casting super alloys - low pressure turbine	NETMA
Components	GENERAL ELECTRIC
Manufacture of rear turbine structure	GENERAL ELECTRIC
Structural components	HONEYWELL
Design and manufacture of three LPT - Member of the MTRI Consortium	AIRBUS HELICOPTERS
Final assembly of the engine - Member of the MTRI Consortium	AIRBUS HELICOPTERS
Lost wax casting super alloys - low pressure turbine	AIRBUS HELICOPTERS
Lost wax casting super alloys for Turbine	SNECMA
Modules manufacturing	PRATT & WHITNEY
Components manufacturing	PRATT & WHITNEY CANADA
Components manufacturing	PRATT & WHITNEY CANADA
Parts of external equipment of engine	ROLLS-ROYCE
Design and validation of the ROLL POST	ROLLS-ROYCE
Design and manufacture of low pressure turbine (LPT) - Risk Partner	ROLLS-ROYCE
Design and manufacture of Rear Frame - Risk Partner	ROLLS-ROYCE
Lost wax casting super alloys for the LPT	ROLLS-ROYCE
Lost wax casting super alloys for the intermediate pressure turbine	ROLLS-ROYCE
Design and manufacture of low pressure turbine (LPT) - Risk Partner	ROLLS-ROYCE
Design and manufacture of the Rear Frame - Risk Partner	ROLLS-ROYCE
Lost wax casting super alloys for the LPT	ROLLS-ROYCE
Assembly of the LPT and component manufacture	ROLLS-ROYCE
Lost wax casting super alloys for the intermediate pressure turbine	ROLLS-ROYCE
Design and manufacture of the low pressure turbine (LPT) - Risk Partner	ROLLS-ROYCE
Design and manufacture of the low pressure turbine (LPT) - Risk Partner	ROLLS-ROYCE
Design and manufacture of the Rear Frame - Risk Partner	ROLLS-ROYCE
Lost wax casting super alloys for the LPT	ROLLS-ROYCE
Lost wax casting super alloys for the intermediate pressure turbine	ROLLS-ROYCE
Design and manufacture of the low pressure turbine (LPT) - Risk Partner	ROLLS-ROYCE
Design and manufacture of the Rear Frame - Risk Partner	ROLLS-ROYCE
Lost wax casting super alloys for the LPT	ROLLS-ROYCE
Lost wax casting super alloys for the intermediate pressure turbine	ROLLS-ROYCE
Development of the intermediate pressure turbine and the rear structure	ROLLS-ROYCE

OEM	ENGINE MODEL	PLATFORMS
EUROJET	EJ200	EUROFIGHTER TYPHOON
GENERAL ELECTRIC	CF34-10	EMBRAER 190/LINEAGE 1000
GENERAL ELECTRIC	GE90-115	BOEING 777
HONEYWELL	HTF7000	BOMBARDIER CHALLENGER 300
MTRI	MTR390-E	AIRBUS HELICOPTERS TIGRE
MTRI	MTR390-E	AIRBUS HELICOPTERS TIGRE
MTRI	MTR390-E	AIRBUS HELICOPTERS TIGRE
POWERJET	SaM146	SUKHOI SUPERJET 100
PRATT & WHITNEY	PW1000G	MRJ90/MS-21/A220/A320neo
PRATT & WHITNEY	PW535E	EMBRAER PHENOM 300
PRATT & WHITNEY	PW800	GULFSTREAM G500/600
ROLLS-ROYCE	BR725	GULFSTREAM G650
ROLLS-ROYCE	F136	LOCKHEED MARTIN F-35
ROLLS-ROYCE	TRENT 1000	BOEING 787
ROLLS-ROYCE	TRENT 1000	BOEING 787
ROLLS-ROYCE	TRENT 1000	BOEING 787
ROLLS-ROYCE	TRENT 1000	BOEING 787
ROLLS-ROYCE	TRENT 500	AIRBUS A340
ROLLS-ROYCE	TRENT 500	AIRBUS A340
ROLLS-ROYCE	TRENT 500	AIRBUS A340
ROLLS-ROYCE	TRENT 700	AIRBUS A330
ROLLS-ROYCE	TRENT 700	AIRBUS A330
ROLLS-ROYCE	TRENT 7000	AIRBUS A330neo
ROLLS-ROYCE	TRENT 900	AIRBUS A380
ROLLS-ROYCE	TRENT 900	AIRBUS A380
ROLLS-ROYCE	TRENT 900	AIRBUS A380
ROLLS-ROYCE	TRENT 900	AIRBUS A380
ROLLS-ROYCE	TRENT XWB	AIRBUS A350XWB
ROLLS-ROYCE	TRENT XWB	AIRBUS A350XWB
ROLLS-ROYCE	TRENT XWB	AIRBUS A350XWB
ROLLS-ROYCE	TRENT XWB	AIRBUS A350XWB
ROLLS-ROYCE	ULTRAFAN	Miscellaneous

3.2. Engines

General Description of the Product/services	DIRECT CLIENT
KHEGAL AERONÁUTICA	
Injection elementary components Machining	AD GROUP
MESIMA	
Materials management and supply	ITP AERO
Materials management and supply	WEC
METALÚRGICA MARINA	
Machining Tooling manufacturing	ITP AERO
Load Tester Tooling manufacturing	ITP AERO
NUTER	
Fittings	ITP AERO
Fittings	ITP AERO
Fittings	ITP AERO
Airfoils & Small parts	ITP AERO
Small Parts & Fittings	ITP AERO
Nozzels	ITP AERO
Fittings	ITP AERO
Fittings	ITP AERO
Small Parts	ACITURRI
ONA ELECTROEROSIÓN	
Wire EDM machine	SAFRAN HELICOPTERS ENGINES
Die-Sinking EDM machine	GENERAL ELECTRIC
Die-Sinking EDM machine	AVIC CHINA
Wire EDM machine	GENERAL ELECTRIC
RENISHAW IBÉRICA	
Measurement data for the production and repair of blades and bladed disks: Blade tip refurbishment, in-process blade measurement and root blending of bladed disks. Contact and non-contact tool setting systems to detect and adjust to the condition or wear of cutting tools.	Miscellaneous
Precision sensors for fast, accurate acquisition of component dimensions and surface data. They include blade-specific software applications.	Miscellaneous
Component set up, tool setting and in-cycle gauging and first off component inspection for accurate machining processes.	Miscellaneous
SARIKI METROLOGÍA	
Measurement Equipment and Consultancy-supply, maintenance, training and software programming	ITP AERO
Measurement Equipment maintenance, training and software programming	ITP AERO
SIKULAN	
Cutting Tools for Aerospace manufacturing	ITP AERO

OEM	ENGINE MODEL	PLATFORMS
CFM INTERNATIONAL	CFM56	AIRBUS A320 / BOEING 737
ROLLS-ROYCE / GE	Miscellaneous	Miscellaneous
Several	Miscellaneous	Miscellaneous
Several	Several	Miscellaneous
Several	Several	Miscellaneous
EPI	TP400	AIRBUS A400M
EUROJET	EJ200	EUROFIGHTER TYPHOON
GENERAL ELECTRIC	Several	Miscellaneous
PRATT & WHITNEY	PW-800	GULFSTREAM G500/600
PRATT & WHITNEY	PW1000G	A220 / A320NEO / SpaceJet (MRJ)
PRATT & WHITNEY	PW1000G	A220 / A320NEO / SpaceJet (MRJ)
ROLLS-ROYCE	TRENT family	Miscellaneous
ROLLS-ROYCE	ULTRAFAN	Miscellaneous
SAFRAN AIRCRAFT ENGINES	Several	Miscellaneous
SAFRAN HELICOPTERS ENGINES	Several	Miscellaneous
GENERAL ELECTRIC	Several	Miscellaneous
AVIC	Several	Miscellaneous
GENERAL ELECTRIC	Several	Miscellaneous
Several	All range	Miscellaneous

3.2. Engines

General Description of the Product/services	DIRECT CLIENT
SIKULAN	
Cutting Tools for Aerospace manufacturing	ITP AERO
SISTEPLANT	
Review of Assembly standards	ITP AERO
TAES	
Components Deep precision Drilling	EGILE
Components Deep precision Drilling	GAZC
Components Deep precision Drilling	GALVATEC
TECNASA	
Silicone Grommets	ITP AERO
WEC	
Parts of external equipment of engine	SAFRAN AIRCRAFT ENGINES
Parts of external equipment of engine	SAFRAN AIRCRAFT ENGINES
Parts of external equipment of engine	ITP AERO
Structural parts	ITP AERO
Exhaust nozzle parts	ITP AERO
TEC parts	ITP AERO
Parts of external equipment of engine	ITP AERO
Parts of external equipment of engine	SAFRAN AIRCRAFT ENGINES
Rings, annular components, combustion chamber components	HONEYWELL
Parts of external equipment of engine	ITP AERO
TEC Front Cases	GKN Aerospace Engine Systems
Structural parts	ITP AERO
Parts of external equipment of engine	ITP AERO
Dynamic seals components	ITP AERO
Parts for engine cooling devices	SAFRAN AIRCRAFT ENGINES
WOLCO	
Special Cutting Tools for Aerospace manufacturing	ITP AERO

OEM	ENGINE MODEL	PLATFORMS
Several	All range	Miscellaneous
Several	Several	Miscellaneous
Several	Miscellaneous	Miscellaneous
CFM INTERNATIONAL	CFM56	AIRBUS A320 / BOEING 737
CFM INTERNATIONAL	LEAP 1A/B	AIRBUS A320neo / BOEING 737MAX
EPI	TP400	AIRBUS A400M
EPI	TP400	AIRBUS A400M
EUROJET	EJ200	EUROFIGHTER TYPHOON
EUROJET	EJ200	EUROFIGHTER TYPHOON
EUROJET	EJ200	EUROFIGHTER TYPHOON
GENERAL ELECTRIC	GE90-115k	BOEING 777
HONEYWELL	Several	Miscellaneous
PRATT & WHITNEY	PW 814	GULFSTREAM G500
ROLLS-ROYCE	Several	Miscellaneous
ROLLS-ROYCE	TRENT family	Miscellaneous
ROLLS-ROYCE	TRENT family	Miscellaneous
ROLLS-ROYCE	TRENT family	Miscellaneous
SAFRAN AIRCRAFT ENGINES	SILVERCREST	CESSNA Citation / DASSAUL FALCON 5X
Several	Miscellaneous	Miscellaneous

3.3. Systems & Equipment

General Description of the Product/service	DIRECT CLIENT
AALBERTS SURFACE TECHNOLOGIES TEY	
Heat treatments	AIRBUS DS
Heat treatments	HÉROUX-DEVTEK SPAIN
Heat treatments	EGILE
Heat treatments	INDRA
Heat treatments	SAFRAN LANDING SYSTEMS
Heat treatments	SENER AEROESPACIAL
ACITURRI	
Hydraulic Tanks	HÉROUX-DEVTEK SPAIN
Auxiliary Fuel Tanks	AIRBUS DS
Equipped elements	RATIER FIGEAC
AEROMECH	
Nose and main landing gear components	Several
Main landing gear components	Several
CIDETEC	
Surface preparation	EIBAR PRECISION CASTING
Non Destructive Inspection	EGILE
Non Destructive Inspection	GRUPO TTT
CTA	
MLG retraction actuator test	HÉROUX-DEVTEK SPAIN
Electrovalve Tests	CIRCOR
Flow servovalve tests	COLLINS
Main and Tail Rotor Endurance Tests	INDRA
Flow Servovalve tests	SAFRAN
DANOBATGROUP	
Grinding Machine-Tools for Landing Gears	SAFRAN LANDING SYSTEMS
Machine tools for aerocomponents manufacturing	Several
EGAMASTER	
Tool control inventory management system	AIRBUS HELICOPTERS
EGILE	
Slider	SAFRAN LANDING SYSTEMS
Rack	SAFRAN LANDING SYSTEMS
Cylinder & Piston	SAFRAN LANDING SYSTEMS
Shock Absorber	SAFRAN LANDING SYSTEMS
Shock Absorber	SAFRAN LANDING SYSTEMS
Actuation systems	HÉROUX-DEVTEK SPAIN
Balancier équipé	SAFRAN LANDING SYSTEMS
Landing gear components	HÉROUX-DEVTEK SPAIN
Slider	SAFRAN LANDING SYSTEMS

	SYSTEM / EQUIPMENT	PLATFORMS
	Several	Miscellaneous
	Landing Gear	Miscellaneous
	Several	Miscellaneous
	Hydraulic system	AIRBUS A380
	Fuel system components	EUROFIGHTER TYPHOON
	Turboprop systems	Miscellaneous
	Landing Gear	AIRBUS DS C295
	Landing Gear	AIRBUS DS CN235
	Air Control System	Miscellaneous
	Landing gear	Miscellaneous
	Landing gear	Miscellaneous
	Landing gear	AIRBUS A350 XWB
	Electrovalve	AIRBUS A350 XWB
	Electrovalve	AIRBUS A350 XWB
	Rotor	INDRA PELÍCANO
	Servo valve	Mitsubishi SpaceJet (MRJ)
	Landing gear	Miscellaneous
	Several	Miscellaneous
	EGAWARE	Miscellaneous
	NLG	AIRBUS A320
	NLG	AIRBUS A320
	RETRACTION ACTUATOR MLG	AIRBUS A330
	MLG	AIRBUS A330/A340
	MLG	AIRBUS A350
	Several	AIRBUS DS CN235/C295
	Landing Gear	AIRBUS HELICOPTERS SUPER PUMA
	Balancier	AIRBUS HELICOPTERS TIGRE
	NLG	ATR 42/72

3.3. Systems & Equipment

General Description of the Product/service	DIRECT CLIENT
EGILE (cont.)	
Shock Absorber	SAFRAN LANDING SYSTEMS
Shock Absorber	SAFRAN LANDING SYSTEMS
Carters and main rotor shaft	HELICOPTERES GUIMBAL
Gears and shafts	SAFRAN POWER UNITS
Flight control & actuation systems	HÉROUX-DEVTEK SPAIN
Gears and shafts	AIRBUS HELICOPTERS
Lubricant Pumps	AIRBUS HELICOPTERS
Gears and shafts	SAFRAN POWER UNITS
Landing gear components	HEROUX DEVTEK UK
Actuation systems	HÉROUX-DEVTEK SPAIN
EIBAR PRECISION CASTING	
Conduits- Air Fittings (Lost wax casting superalloys)	LIEBHERR AEROSPACE
Optronic equipment housings (Lost wax casting aluminium)	THALES GROUP
Optronic equipment housings (Lost wax casting aluminium)	SAFRAN AEROSYSTEMS
Conduits- Air Fittings (Lost wax casting superalloys)	LIEBHERR AEROSPACE
Conduits- Air Fittings (Lost wax casting superalloys)	IAI
Radar housings (Lost wax casting aluminium)	INDRA
Optronic equipment housings (Lost wax casting aluminium)	SAFRAN ELECTRONICS AND DEFENCE
Optronic equipment housings (Lost wax casting aluminium)	ELBIT SYSTEMS
GRUPO TTT	
Heat and surface treatments	BHR Helicopter
Heat and surface treatments	SAFRAN LANDING SYSTEMS
Heat and surface treatments	SAFRAN LANDING SYSTEMS
Heat and surface treatments	WITZENMANN
Heat and surface treatments	HEROUX DEVTEK
Heat and surface treatments	Several
Heat and surface treatments	GOODRICH
Heat and surface treatments	IAI
Heat and surface treatments	SAFRAN TRANSMISSION SYSTEMS
Heat and surface treatments	Several
INDUSTRIAS GALINDO	
Tooling manufacturing	WEC
KHEGAL AERONÁUTICA	
Oil tanks Elementary components Machining	AD GROUP
KORTA	
Ball Screws	SENER AEROESPACIAL
Ball Screws	HÉROUX-DEVTEK SPAIN
Worm Screws	HÉROUX-DEVTEK SPAIN

	SYSTEM / EQUIPMENT	PLATFORMS
	MLG	BOEING 787
	NLG	BOEING 787
	Main rotor	Cabri G2, VSR700
	Pump	DASSAULT RAFALE
	Several	EUROFIGHTER TYPHOON
	MLG and AGB	H160, H175, ...
	MLG and AGB	H160, H175, ...
	APUs	Miscellaneous
	Landing Gear	SAAB GRIPEN
	Several	SIKORSKY S92
	Air conditioning	AIRBUS A220 / A320neo/ceo /BOEING 787
	Engines-Actuators-Electrical equipments	AIRBUS A320/330/380
	Engines-Actuators-Electrical equipments	AIRBUS A320/330/380
	Air conditioning	COMAC / KC395 / EJET / G7000
	Air conditioning	GULFSTREAM 280
	Radars	Miscellaneous
	Optronic systems TV-Thermography	Miscellaneous
	Optronic systems TV-Thermography	Miscellaneous
	Miscellaneous	F360, F290
	Landing Gear	AIRBUS families
	Brakes	AIRBUS families
	Wing leading edge ventilation	AIRBUS families
	Landing Gear	KAI (Korean Aerospace Industries)
	Ventilation / LIEBHERR	Miscellaneous
	Miscellaneous	Miscellaneous
	Miscellaneous	Miscellaneous
	Several	Miscellaneous
	Landing Gear	SIKORSKY
	Several	Miscellaneous
	Lubrication systems	AIRBUS A350XWB
	Actuators	Miscellaneous
	Actuators	Miscellaneous
	Actuators	Miscellaneous

3.3. Systems & Equipment

General Description of the Product/service	DIRECT CLIENT
METRALTEC	
Manufacture of elementary parts and assemblies (sheet metal, machining, heat treatments and surface treatments, painting)	SENER AEROESPACIAL
MICROLAN	
Precision Machining of components, Turning and Milling	Several
NUTER	
Machined Components	HÉROUX-DEVTEK SPAIN
Machined Components	HÉROUX-DEVTEK SPAIN
Machined Components	HÉROUX-DEVTEK SPAIN
RENISHAW IBÉRICA	
Raman spectroscopy technology for the material make-up of specialist components and the quality of component surface coatings	Miscellaneous
SENER AEROESPACIAL	
Program to extend the life of the Spanish Navy's AB212 helicopters	Head of Logistics Support (JAL) -Spanish Navy
Production of the Control Section of aerodynamic fins and fixed wings (Air - Air version)	DBD
Development, qualification, industrialisation and production of the Control Section of aerodynamic fins	MBDA-UK
Image management unit for two Tactical Recognition systems (ReccLite or Litening Pods)	RAFAEL
FASS subsystem of drive and control of aerodynamic fins	TAURUS Systems
SANTIAGO POD COMINT R&D project	Spanish Ministry of Defence
Remote Carrier Technology Pillar of the Next Generation Weapon System (NGWS) of the FCAS	Spanish Ministry of Defence
Technological teammate of GA-ASI for the integration of the Remotely Piloted Aircraft (RPA) system MQ-9 in the Spanish Armed Forces	GENERAL ATOMICS
NATO Pod for the MQ-9	GENERAL ATOMICS
Development and qualification of the Control Section of aerodynamic fins (Surface Launch version)	DBD
Stabilized Mirror Unit (SMU) of the sight	SAAB Dynamics
GREASES	BAYANAT AIRPORTS ENGINEERING & SUPPLIES
ACCESORIOS	BROAD TELECOM
HYBRID SUPPLES BIII	BROAD TELECOM
MEASURING COUPLERS 6 1/8	CERN
LVA ACCESSORIES	EASAT RADAR SYSTEMS
LVA 4 M MSSR ANTENNA	EASAT RADAR SYSTEMS
FAT CSL-M C open columns	HENSOLDT Australia
RSL-2130+RT211 Spare Parts	HENSOLDT Australia

	SYSTEM / EQUIPMENT	PLATFORMS
	Several	Miscellaneous
	Several	Miscellaneous
	Several	AIRBUS A330/A350XWB
	Several	AIRBUS A400M
	Several	EUROFIGHTER
	Several	Miscellaneous
	Several	AGUSTA-BELL AB 212
	Control Systems	Defence Systems
	Control Systems	Defence Systems
	IPU 2 / IPU 3	Defence Systems
	Control Systems	Defence Systems
	Communications Intelligence (COMINT) demonstrator	EuroMALE RPA
	NGWS	FCAS
	MQ-9	RQ-1
	MQ-9A & MQ-9B	RQ-1
	Control Systems	Ground equipment
	RBS 70 NG	Ground equipment
	ATC Secondary Radars	Ground equipment
	ATC Secondary Radars	Ground equipment
	ATC Secondary Radars	Ground equipment
	ATC Secondary Radars	Ground equipment
	ATC Secondary Radars	Ground equipment
	ATC Secondary Radars	Ground equipment
	ATC Secondary Radars	Ground equipment

3.3. Systems & Equipment

General Description of the Product/service	DIRECT CLIENT
SENER AEROESPACIAL (cont.)	
Spare parts	HENSOLDT Sensors
RSL 2730A ANTENNA	HENSOLDT Sensors
ANTENNAS DVOR	INDRA
ANTENNAS and FILTRES CSLM-C	INDRA
COLUMNS	INDRA
Radiation Set ADS-B	INDRA
ANTENNA IFF RSL-2330 4 MTS	INDRA
SUBASSY GTE MOD 9	INDRA
DuplexersS L TR25	INDRA
Set GTE SAAR	INDRA
CE MARKING SYSTEMS DRAG Tests	INDRA
RSL2730 SSR ANTENNA	INDRA
Portable Antennas	INDRA
ANTENNAS VPOL	INDRA
FAT ENAIRE	INDRA
Control Unit rewired	INDRA
ANTENNA RADAR ARIES S-80	INDRA
EMI filter boxes	INDRA
Mixed Columns	INDRA
LVA 8m MSSR Antenna, model RSL-2730(A)	MITSUBISHI ELECTRIC EUROPE
LVA MSSR ANTENNA FOR AIR TRAFFIC	NEC EUROPE
ANTENNAS RSL-2730	RAYTHEON SYSTEMS
ANTENNA RADIATOR COLUMN	RAYTHEON SYSTEMS
3 CHANNEL COAX ROTARY JOINT	RAYTHEON SYSTEMS
ANTENNA LVA MK2	RAYTHEON SYSTEMS
ANTENNA LVA 8M MSSR MODEL RSL-2730	THALES NEDERLAND
LVA 8M MSSR ANTENNA, MODEL RSL-2735	TÜBITAK BILGEM
LVA 8M MSSR ANTENNA, MODEL RSL-2735	TÜBITAK BILGEM
SISTEPLANT	
Manufacturing Execution System implementation - New features	EGILE
Manufacturing Execution System implementation	HÉROUX-DEVTEK SPAIN
TAES	
Components Deep precision Drilling	HÉROUX-DEVTEK SPAIN
TECNASA	
Firing Handles	MARTIN-BAKER
O-RINGS	MARTIN-BAKER
JIGS	MARTIN-BAKER

3.3. Systems & Equipment

General Description of the Product/service	DIRECT CLIENT
WEC	
Air Bleed equipment parts	HONEYWELL
Air Bleed equipment parts	LIEBHERR
XUBI	
Rotating transmission	GENERAL DYNAMICS
Actuation systems/linear actuator	IAI
Gear transmission	IAI
Rotating transmission	IAI

	SYSTEM / EQUIPMENT	PLATFORMS
	Air Treatment Management	AIRBUS A320/330, DASSAULT F7X
	Air Treatment Management	AIRBUS A320/A330/A400M, CSeries
	Air Treatment Management	AIRBUS A320neo
	Air Treatment Management	AIRBUS A330neo
	Air Treatment Management	AIRBUS A400M
	Air Treatment Management	BOEING 747-8
	Air Treatment Management	DASSAULT F7X
	Azimut	Miscellaneous
	Control systems	Miscellaneous
	Control systems	Miscellaneous
	Radar	Miscellaneous

3.4. Space

General Description of the Product/service	DIRECT CLIENT
AALBERTS SURFACE TECHNOLOGIES TEY	
Heat treatments	AIRBUS DS
Heat treatments	INDRA
Heat treatments	SENER AEROESPACIAL
AERNOVA	
Large and Complex Machined parts and Assemblies	SPACE X
Large and Complex Machined parts and Assemblies	SPACE X
ANTERAL	
Quasi Optical System - Milestone 1	CAST
ARATZ	
Machined Components	Several
Components for satellite antennas	Several
BURDINBERRI	
IFS section assembly jig	AIRBUS DS
IFS section headstock and tailstock turning supports	AIRBUS DS
CIDETEC	
Surface preparation	SENER AEROESPACIAL
Surface treatments	FINITEC ELECTROLISIS
CTA	
Multi-Payload Component Static Tests	AIRBUS DS
Antenna	AIRBUS DS
Controller shock tests	CRISA
Heat pipes system	IBERESPACIO
Mechanisms	SENER AEROESPACIAL
Optical components	LIDAX
DYFA	
CAD, CAM, Machining and dimensional control panels satellite	Several
GRUPO TTT	
Heat and surface treatments	AIRBUS DS
Heat and surface treatments	SENER AEROESPACIAL
INDUSTRIAS GALINDO	
Tooling manufacturing	THALES ALENIA SPACE
ITP AERO	
ITP AERO	SAFRAN AIRCRAFT ENGINES
LTK GRUPO	
Special Aerospace Logistics: Transport, Stock, Handling, Quality control...	AIRBUS DS
METALÚRGICA MARINA	
Precision machining of laboratory components	SENER AEROESPACIAL
Precision machining of dummies	SENER AEROESPACIAL

	SYSTEM / EQUIPMENT	PLATFORMS
	Several	Miscellaneous
	Several	Miscellaneous
	Several	Miscellaneous
	Several	FALCON 9
	Several	FALCON HEAVY
	QON	Earth Observation
	Satellite	Miscellaneous
	Satellite Antennas	Miscellaneous
	Launcher	ARIANE 6
	Launcher	ARIANE 6
	Satellite	Miscellaneous
	Satellite	Miscellaneous
	Structure	FALCON 9
	Telecom	Miscellaneous
	Flight Control	Miscellaneous
	Thermal Protection System	Miscellaneous
	Telecom	Miscellaneous
	Mission	MTO
	Satellites	Miscellaneous
	Propulsion systems	ARIANE
	Systems	Miscellaneous
	Collars	CSO SATELLITE
	Shuttle	ARIANE 5
	Several	Miscellaneous
	Several	Miscellaneous
	Several	Miscellaneous

3.4. Space

General Description of the Product/service	DIRECT CLIENT
METRALTEC	
Manufacture of elementary parts and assemblies (sheet metal, machining, heat treatments and surface treatments, painting)	SENER AEROESPACIAL
MICROLAN	
Precision Machining of components, Turning and Milling	Several
NUTER	
Machined Components	SENER AEROESPACIAL
Machined Components	SENER AEROESPACIAL
Machined Components	SENER AEROESPACIAL
RENISHAW IBÉRICA	
Metal 3D printing systems	Miscellaneous
SATLANTIS	
High resolution multispectral Cameras for Earth observation microsattelites	Several
Embedded solution for methane emissions detection and quantification	Several
SENER AEROESPACIAL	
Advanced Receiver for L-Band Radiometer	ESA
Amazonas Nexus	THALES ALENIA SPACE FRANCE
TTC ANTENNAS	AIRBUS DEFENCE AND SPACE SAS
Kassav	ARIANE GROUP
TELEMETRY ANTENNA (TMANT)	ARIANE GROUP
TMANT Exploitation	ARIANE GROUP
Assembly and testing of actuator at 40K temperature to demonstrate whether this concept is valid for the ARIEL mission	ESA
Compact Ka	ESA
KU-BAND GLOBAL ANTENNAS	ESA
TTC EQUIPMENT	ORBITAL SCIENCES CORPORATION
Ka-Band TTC Antennas	ASTRANIS SPACE TECHNOLOGIES
Design, manufacture and test a prototype of the HDRA (Hold Down and Release Actuator) mechanism	ESA
Design, manufacture and test the Instrument Selection Mechanism (ISM)	ESA
Analysis of different alternatives for planetary vehicle landing gear	ESA
Tcr Equipment	AIRBUS DS
Design, manufacture and test devices for assembly of the Biomass satellite	ESA
Mechanical ground support equipment (MGSE) for assembly of BIOMASS Space Mission	OHB ITALIA
RAS	AIRBUS DS
MULTI FREQUENCY FEEDS phase A/B1	AIRBUS DS
PB2	OHB ITALIA
ISL Antenna	ESA
DEMPCOS	ESA

	SYSTEM / EQUIPMENT	PLATFORMS
	Several	Miscellaneous
	Satellites	Miscellaneous
	Several	GAIA
	Several	METEOSAT THIRD GENERATION
	Several	MTG
	Several	Miscellaneous
	Space imagers: iSIM Family	Miscellaneous
	GEI-SAT	Miscellaneous
	Advanced Receiver for L-Band Radiometer	Advanced Receiver for L-Band Radiometer
	Amazonas Nexus	Amazonas Nexus
	ANGOSAT 2 TTC ANTENNAS	ANGOSAT
	Kassav	ARIANE 6
	TELEMETRY ANTENNA (TMANT)	ARIANE 6
	TELEMETRY ANTENNA (TMANT)	ARIANE 6
	REFOCUSING MECHANISM DERISKING	ARIEL
	Compact Ka	ARTES 3-4
	KU-BAND	ARTES C&G
	Several	ASBM
	Ka-Band TTC Antennas	ASTRANIS
	Scientific Mission	ATHENA
	Scientific Mission	ATHENA
	Planetary exploration ship -Scientific Mission	AURORA - Mars Sample Return Mission
	Tcr Equipment	BADR-8
	Scientific Mission	BIOMASS
	MGSE	BIOMASS
	RAS	BIOMASS
	Equipment	CIMR
	PB2	COMET
	ISL Antenna	COMET
	DEMPCOS	DEMPCOS

3.4. Space

General Description of the Product/service	DIRECT CLIENT
SENER AEROESPACIAL (cont.)	
Clamping mechanism for the B1 phase	ESA
Segment manipulator (SeM) for the M1 (primary mirror)	ESO - European Southern Observatory
Design and construction of the cells of the secondary (M2) and tertiary (M3) mirrors	ESO - European Southern Observatory
Design and construction of the cells for the fifth mirror (M5)	ESO - European Southern Observatory
MGSE	ESA
KU-BAND ANTENNAS	LUXSPACE
Development of fluid connectors for refueling between DSG (Deep Space Gateway) modules connected by IBDM (International Berthing and Docking Mechanism)	ESA
Prime contractor for Euclid's AOCS/GNC	ESA / THALES ALENIA SPACE
High Gain Antenna Gimbal	ESA / THALES ALENIA SPACE
LGA ANTENNAS	THALES ALENIA SPACE ESPAÑA
Preliminary design of the M1 primary mirror	IAC
WHITE TAIL KU-BAND ANT.&FIL.	AIRBUS DS
ExoMars Rover Solar Array Assembly	ESA / ROSCOSMOS
LGA ADDITIONAL HARDWARE	ANTWERP SPACE
LPA UHF Helix Antenna	ESA
AMU 3/7	THALES ALENIA SPACE ITALIA
Optical Bench (OBA)	ESA / LEONARDO
S BAND ANTENNAS	THALES ALENIA SPACE ESPAÑA
GALAXY-30 EQUIPMENT	ORBITAL SCIENCES CORPORATION
WAAS L-Band Hardware	ORBITAL SCIENCES CORPORATION
ISL APM	OHB-SYSTEM
ISL APME	OHB-SYSTEM
ISL	OHB-SYSTEM
ISL Udc	OHB-SYSTEM
FOC SARANT (Batch 3)	SURREY SATELLITE TECHNOLOGY
FOC S-Band Antennas (Batch 3)	OHB-SYSTEM
MISSION RECEIVER FOR GALILEO WO3	SURREY SATELLITE TECHNOLOGY
OPDN (output Power Distribution Network)	AIRBUS DS
Misrec G2g Patp	OHB SYSTEM
Navigation Filters (navflt)	THALES ALENIA SPACE ITALIA SPA
ANTENNAS	AIRBUS DS
L-Band Filters	THALES ALENIA SPACE ITALIA
Reflector	THALES ALENIA SPACE
Lunar Communication System	THALES ALENIA SPACE
L BAND RLNA & CPSU	AIRBUS DS
PRE ADC AMPLIFIER	AIRBUS DS
C-BAND ANTENNAS & FILTERS	AIRBUS DS

	SYSTEM / EQUIPMENT	PLATFORMS
	Mission to combat the space debris problem	E-Deorbit
	Infrared optical telescope	E-Extreme Large Telescope
	Infrared optical telescope	E-Extreme Large Telescope
	Infrared optical telescope	E-Extreme Large Telescope
	Mechanical ground support equipment (MGSE)	ELECTRA
	KU-BAND ANTENNAS	ELECTRA
	REFUELING INTERFACE DEVELOPMENT	ESPRIT
	Scientific Mission	EUCLID
	Scientific Mission	EUCLID
	LGA ANTENNAS	EUCLID
	European Solar Telescope	European Solar Telescope EST
	KU-BAND	EUROSTAR
	EXOMARS ROVER	EXOMARS
	LGA ANTENNAS	EXOMARS
	LPA UHF	EXOMARS
	AMU	EXPRESS AMU 3/7
	FLORIS Instrument	FLEX
	S BAND ANTENNAS	FLEX
	Equipment	GALAXY-30
	L-Band	Galaxy-30
	Equipment	GALILEO
	OPDN	GALILEO 2ND GEN.
	Misrec G2g Patp	GALILEO 2ND GEN.
	Navigation Filters (navflt)	GALILEO 2ND GEN.
	ANTENNAS	GEO-NG
	L-Band	GPLTB
	Reflector	HALO
	Communications	HALO
	L BAND RLNA & CPSU	INMARSAT 6
	PRE ADC AMPLIFIER	INMARSAT 6
	C-BAND ANTENNAS & FILTERS	INMARSAT 6

3.4. Space

General Description of the Product/service	DIRECT CLIENT
SENER AEROESPACIAL (cont.)	
40e Power Dividers	MAXAR
C-band	MAXAR
In-flight demonstration study of all the functions of the mechanism and Guidance, Navigation and Control system (GNC)	ESA / ESTEC
Hard Capture System (HCS) of the IBDM (International Berthing and Docking Mechanism)	ESA / ESTEC
I-Hab HCS-IBDM (International Berthing and Docking Mechanism)	QINETIC SPACE
Fixation Box for a vegetal biology experiment to be performed at the ISS	ESA
C-BAND HORN MADE OF CFRP	ESA
Complete Guidance, Navigation and Flight control subsystem (GNC)	ESA
Design, manufacture and test devices for assembly of the Biomass satellite	ESA
High gain antenna pointing mechanisms (HGAG) of the Rover	NASA / AIRBUS
Actuator system for the JST (Javalambre Survey Telescope) panoramic camera	Institute of Astronomy, Geophysics and Atmospheric Science of Sao Paulo University
Medium-Gain Antenna Main Assembly (MGAMA)	AIRBUS DS
MAGBOOM	ESA
Mechanical ground support equipment (MGSE) for assembly and testing of solar array wings	ESA
DFACS assessment and prototyping	ESA
For the lunar landing vehicle that will later be coupled to the station in order to collect lunar soil samples: structural design, mechanisms and thermal control	AIRBUS
Design of the four Hatches and the internal secondary structure	AIRBUS
Design of the docking and berthing mechanisms between the I-HAB and the various modules, which will be assembled in orbit	AIRBUS + THALES ALENIA SPACE
S-band deployable antenna integrated into the lunar ascent module	ESA
Assessment on the motorised Hatch, the communication antenna pointing mechanism and the robotic arm interfaces	THALES ALENIA SPACE
Interfaces for the robotic arms (external and internal)	THALES ALENIA SPACE
High gain antenna pointing mechanisms (HGAG) of the Rover	NASA / AIRBUS DS
MEASAT 3D	AIRBUS DS
Technical and engineering assistance in the project	ESA
Scan assembly (FCI and IRS SCA) and the Calibration and Obturation Mechanism (FCI and IRS COM)	ESA / Kayser-Threde
Attitude and orbit control system, Special Check Out Equipment (AOCS SCOE)	ESA / OHB System
S-BAND ANTENNAS	AIRBUS DS

	SYSTEM / EQUIPMENT	PLATFORMS
	Equipment	INTELSAT
	Equipment	INTELSAT
	Docking and joining mechanism -Navigation	ISS - International Space Station
	Docking and joining mechanism -Navigation	ISS - International Space Station
	I-Hab HCS	ISS - International Space Station
	FixBox	ISS - International Space Station
	C-BAND HORN	ITI
	Intermediate experimental vehicle for re-entry into atmosphere	IXV
	Scientific Mission	JPL mission
	New rover	JPL mission
	Camera actuator system	JST
	Science Mission	JUICE
	Science Mission	JUICE
	Science Mission	JUICE
	Equipment	LISA
	Future space station in lunar orbit	LOP-Gateway lunar mission
	Future space station in lunar orbit	LOP-Gateway lunar mission
	Future space station in lunar orbit	LOP-Gateway lunar mission
	Future space station in lunar orbit	LOP-Gateway lunar mission
	Future space station in lunar orbit	LOP-Gateway lunar mission
	Future space station in lunar orbit	LOP-Gateway lunar mission
	Planetary exploration ship -Scientific Mission	MARS SCIENCE LABORATORY
	MEASAT 3D	MEASAT 3D
	Developing a life-support system for long duration space travel and planetary bases	MELISSA
	Observation satellite	METEOSAT THIRD GENERATION
	Observation satellite	METEOSAT THIRD GENERATION
	S-BAND ANTENNAS	METOP

3.4. Space

General Description of the Product/service	DIRECT CLIENT
SENER AEROESPACIAL (cont.)	
LO	AIRBUS DS
ICI	EUMETSAT / ESA
FGM	RUAG AEROSPACE SWEDEN
KONNECT HYBRIDS VHTS	THALES ALENIA SPACE FRANCE
Thuraya Lna's	AIRBUS DS
Thuraya Tcr Equipment	AIRBUS DS
Smile Payload Module (plm) X-band Antenna	AIRBUS DS
Power Propulsion Element	MAXAR
C-band Program	NORTHROP GRUMMAN
Prototyping of Spacecraft Refuelling	THALES ALENIA SPACE FRANCE
VNE phase CDE1	AVIO SPA
Ku	ESA
Ku Band Ttcs & Tcr Couplers	THALES ALENIA SPACE FRANCE
Gw-v Development	AIRBUS DS
Cpsu	AIRBUS DS
Gw-Ina Development	AIRBUS DS
Tcr Antennas	AIRBUS DS
USER BEAM LNAs Ku-Ka BAND	AIRBUS DS
DTA10-104 rotary actuators	AIRBUS DS
GPS ANTENNAS	Airbus Oneweb Satellites North America LLC
TTC ANTENNAS	Airbus Oneweb Satellites North America LLC
Additional Test Caps For GPS	AIRBUS ONEWEB
Actuators	ESA
PASSIVE EQUIPMENT	MAXAR
Mechanical ground support equipment (MGSE)	OHB SYSTEM
PSHF	OHB SYSTEM
Main contractor of the entire program	ESA
Main contractor of the formation flying system	ESA / GMV
S-BAND ANTENNAS	QinetiQ Space
DTJ Phase CD	LEONARDO
Thermal louvers for the satellite mission to the asteroid Psyche	MAXAR
S-BAND ANTENNAS	OHB-SYSTEM
Equipment	THALES ALENIA SPACE FRANCE
Radar deployment system	ESA / AIRBUS DS
Design and verification of a swinging mechanism or FMD (Flip Mirror Device)	ESA / JENA OPTRONIK

	SYSTEM / EQUIPMENT	PLATFORMS
	LO	METOP 2G
	Delivery of the Engineering Qualification Models (EQM) of the Ice Cloud Imager (ICI) Back End Receivers	METOP SG
	FGM	METOP SG
	VHTS	Miscellaneous
	Thuraya Lna's	Miscellaneous
	Thuraya Tcr Equipment	Miscellaneous
	Smile Payload Module (plm) X-band Antenna	Miscellaneous
	Propulsion	Miscellaneous
	C-band Program	Miscellaneous
	Prototyping of Spacecraft Refuelling	Miscellaneous
	VNE phase CDE1	NAVIGA
	Ku	NEXT GENERATION ARTES-34
	Equipment	NILESAT 301
	Equipment	ONESAT
	Equipment	ONESAT
	Equipment	ONESAT
	Tcr Antennas	ONESAT
	USER BEAM LNAs Ku-Ka BAND	ONESAT
	Telecommunications platforms	ONESAT / EUOSTAR NEO
	ANTENNAS	ONEWEB
	ANTENNAS	ONEWEB
	Tests	ONEWEB
	Actuators	OPSAT
	PASSIVE EQUIPMENT	OVZON-3
	Equipment	PLATO
	Equipment	PLATO
	Phases C/D and E1	PROBA 3
	Formation flying system	PROBA 3
	PROBA-3 S-BAND ANTENNAS	PROBA-3
	DTJ Phase CD	PROSPECT
	PSYCHE LOUVERS	PSYCHE
	S-BAND ANTENNAS	SARah
	Equipment	SATRIA
	Observation satellite - Scientific Mission	SENTINEL 1
	Observation satellite -Sentinel 3-	SENTINEL 3

3.4. Space

General Description of the Product/service	DIRECT CLIENT
SENER AEROESPACIAL (cont.)	
Tt&c And Global Horn Antennas	THALES ALENIA SPACE FRANCE
SPACE RIDER FASE B2/C	THALES ALENIA SPACE ITALIA
Reflector Pointing Assembly	AIRBUS DS
S-band And X-band Tcr Global Horn	AIRBUS DS
Ka-band Feeders Chains And Global Horn	AIRBUS DS
X-band Dra Radiating Chains	AIRBUS DS
Actuators	AIRBUS DS
NG UHF OMUX	THALES ALENIA SPACE ESPAÑA
Spainsat Phase 1 (Govsatcom)	AIRBUS DS
EQUIPMENT	AIRBUS DS
TDRS Antennas	AVIO SPA
VEGA Batch 3 TLM Antennas	AVIO SPA
NAVIGA	AVIO SPA
Prime Focus Corrector (PFC) for the WEAVE Multi-object spectrograph	IAC / Isaac Newton Group (ING)
TECNALIA	
Harmonic drive gears for space applications	ESA
High Temperature Space Based Emissivity Paints for Radiant Heat Recovery on Steelmaking Plants	ESA
Corrosion protective hybrid coating for space	ESA
Citric acid as a green alternative for the passivation of stainless steel tubes	ESA
Application of Solid Lubricants on bearings	ESA

	SYSTEM / EQUIPMENT	PLATFORMS
	Antennas	SES-22
	Equipment	SPACE RIDER
	Equipment	SPAINSAT
	Equipment	THEOS-2
	Antennas	VEGA
	Antennas	VEGA
	Navigation Equipment	VEGA-C
	WEAVE spectrograph	William Herschel Telescope (WHT)
	Mechanism	METEOSAT THIRD GENERATION
	Spacecraft Structures	LAUNCHERS
	Spacecraft Structures	REACH
	Spacecraft Structures	SATELLITES
	Spacecraft Structures	SATELLITES

3.5. MRO

General Description of the Product/service	DIRECT CLIENT
AERNNOVA	
Technical assistance & Sales of spares 24H/365d	AIRBUS
Composite & metal structure repairs	AIRBUS
Sales of spares 24H/365d	BEECHCRAFT
Composite & metal structure repairs	BOMBARDIER
Technical assistance & Sales of spares 24H/365d	BOMBARDIER
Composite & Metal structure repairs	EMBRAER
Composite & Metal structure repairs	EMBRAER
Technical assistance & Sales of spares 24H/365d	EMBRAER
Composite & Metal structure repairs	SIKORSKY
Technical assistance & Sales of spares 24H/365d	SIKORSKY
Maintainability, Reliability Analysis	OEMs
Technical Publications, SRM, AMM, ITEM, SB, etc	OEMs
Modifications at Final Assembly of OEMs	OEMs
Design of repairs	OEMs & Operators
Design of GSEs	OEMs & Operators
Inspections, special processes and re-qualifications	Operators
Technical assistance & Sales of spares 24H/365d	Operators
Composite & metal structure repairs and modifications	Operators
AEROSPACE ENGINEERING GROUP	
Overhaul and repair of electrical components	MRO, Operators, Air Forces, Trading Companies
Overhaul and repair of hydraulic components	MRO, Operators, Air Forces, Trading Companies
Overhaul and repair of electrical components	MRO, Operators, Air Forces, Trading Companies
Overhaul and repair of avionics components	MRO, Operators, Air Forces, Trading Companies
Electrobeam Welding	Several
Spin Test 40.000 RPM	Several
NDTs	Several
DANOBATGROUP	
Grinding Machine Retrofitting	MRO Operators
Machine tools for landing gear MRO	Several
EGAMASTER	
FOD Tool Control system	GLOBALIA
Electronic Kanban systems	GLOBALIA

	SYSTEM / EQUIPMENT	PLATFORMS
	MLGD, HTP, Fuselage, etc	AIRBUS families
	MLGD, Elevators	AIRBUS families
	wings, flaps, ailerons, etc	BEECHCRAFT families
	Tips, fairings, panels, etc	BOMBARDIER Families
	Empenage, fairings, elevators	BOMBARDIER Families
	Elevators, Rudders	EMBRAER 170/190
	Flaps, Ailerons, Wing tips, MLGD, etc	EMBRAER ERJ145/135/Legacy
	Structures and mobile surfaces	EMBRAER families
	Doors, cowlings, stabilisers	SIKORSKY S-92/ H92
	Doors, cowlings, stabilisers	SIKORSKY S-92/ H92
	Several	Miscellaneous
	Electrical Systems	AIRBUS / ATR / BOEING / BOMBARDIER / EMBRAER / FOKKER...
	Hydraulic Systems	AIRBUS / ATR / BOEING / BOMBARDIER / EMBRAER / FOKKER...
	Fuel Systems	AIRBUS / ATR / BOEING / BOMBARDIER / EMBRAER / FOKKER...
	Avionics Systems	Miscellaneous
	Several	Miscellaneous
	Several	Miscellaneous
	Several	Miscellaneous
	Engines	Miscellaneous
	Landing gear	Several
	Several	Miscellaneous
	Several	Miscellaneous

3.5. MRO

General Description of the Product/service	DIRECT CLIENT
ITP AERO	
Resolving incidents	ROLLS-ROYCE
Resolving incidents	ROLLS-ROYCE
Resolving incidents	ROLLS-ROYCE
Full Maintenance, Inspection and Repair, modules and components & engine and accessories test	Spanish Ministry of Defence
Full Maintenance, Inspection and Repair, modules and components & engine and accessories test	Spanish Ministry of Defence
Full Maintenance, Inspection and Repair, modules and components & engine and accessories test	Spanish Ministry of Defence
Full Maintenance, Inspection and Repair, modules and components & engine and accessories test	Spanish Ministry of Defence
Full Maintenance, Inspection and Repair, modules and components & engine and accessories test	Several
Full Maintenance, Inspection and Repair, modules and components & engine and accessories test	Spanish Ministry of Defence
Full Maintenance, Inspection and Repair, modules and components & engine and accessories test	Spanish Ministry of Defence
Full Maintenance, Inspection and Repair, modules and components & engine and accessories test	Spanish Ministry of Defence
Full Maintenance, Inspection and Repair, modules and components & engine and accessories test	Spanish Ministry of Defence
Full Maintenance, Inspection and Repair, modules and components & engine and accessories test	ROYAL AIR FORCE
RENISHAW IBÉRICA	
Retrofited CMMs to be used in engines MRO	

	SYSTEM / EQUIPMENT	PLATFORMS
	RR Trent 700	AIRBUS A330
	RR Trent 500	AIRBUS A340
	RR BR717	BOEING 717
	GE F404	BOEING F/A-18
	HONEYWELL TFE731	CASA C101
	HONEYWELL TPE331	CASA C212
	SNECMA ATAR	DASSAULT MIRAGE Families
	P&W PW206	EUROCOPTER EC135
	EUROJET EJ200	EUROFIGHTER TYPHOON
	RR T56	LOOCKHEED MARTIN C130
	RR T56	LOOCKHEED MARTIN P-3
	GE J85	NORTHROP F-5
	HONEYWELL TPE331	SHORT TUCANO
	Retrofited CMM equiped with REVO2 (5 axis measurement)	Several

3.5. RTD Projects

PROJECT	SUMMARY
AALBERTS SURFACE TECHNOLOGIES TEY	
ITP AERO projects	Heat treatments
SENER AEROESPACIAL projects	Heat treatments
ACITURRI	
EWIRA	Manufacturing, assembly and integration of extended wing for
DAAMAS	Development of WAAM (Wire Arc Additive Manufacturing) technol
COSMOS	Development of components in thermoplastic materials
COPERNICO	Development of strutral parts by RTM
FEINA	Development of strutral parts by WAAM
IMPACT	Development of impact absortion solutions based on auxeniti
CIMA	Aerodynamics optimization by morphologic seal solutions
NIEBLA	Low Observability solutions
INTERNAL DEVELOPMENT	Composites Aerostructures resistant to high temperatures A35
INTERNAL DEVELOPMENT	Integrated fuselage barrel structures
INTERNAL DEVELOPMENT	Optimization of composite beams
INTERNAL DEVELOPMENT	Co-Curing one shot structures
INTERNAL DEVELOPMENT	New Materials & Processes
INTERNAL DEVELOPMENT	Thermoplastics Development
AERNNOVA	
CLEAN SKY 2	Airframe ITD
CLEAN SKY 2	LPA, HLFC HTP and WING
CLEAN SKY 2	LPA, REAREND
CLEAN SKY 2	LPA, THERMOPLASTIC PANELS
FIBEREUSE	Large scale demonstration of new circular economyvalue-chain
SUCOHS	Sustainable & Cost efficient High-performance composite Stru
THOMAS	Collaborative light robotics for assembly operations
S2R PIVOT	Development of new structural components in composite for landin
CIDETEC	
ECOLAND	Development of ECO-friendly protection procedures for LANDing ge
CHOPIN	Coatings with Hydrophobic and/or Omniphobic Properties aga
U-CROSS	Early detection, monitoring and prediction of corrosion damage of Ultrasonic CorROSion Sensors
STELLAR	Development of SmarT Eco-friendly anticontamination techn
AMANECO	Assessment of additive manufacturing limits for eco design op
H2FREE	Investigation and modelling of Hydrogen effusion in electrochemical
LUBGEAR	Tribological behaviour under loss of LUBrication of new optin
REINTEGRA	Innovative End of Life procedures for REcycling INTEGRAI weld

	CALL
	Others
	Others
for a regional aircraft	European - CLEAN SKY 2
Technologies as advanced manufacturing methods for engine components	European - Manunet
	National - CERVERA -CDTI
	National - RETOS -CDTI
	National - RETOS -CDTI
Composite material	National-COINCIDENTE
	Others
	Others
COXWB	Others
	European - CLEAN SKY 2
Structures based on the reuse of end-of-life fiber reinforced composites.	European - H2020
Structures	European - H2020
	European - H2020
gears	European - H2020
near aluminium alloys	European - CLEAN SKY 2
Protection against INsect contamination	European - CLEAN SKY 2
Technologies of coated aeronautic Al alloys through the application of calibrated	European - CLEAN SKY 2
Technologies for LAmInaR wings	European - CLEAN SKY 2
Optimization in heat exchangers	European - CLEAN SKY 2
Thinly plated ultra-high-strength-steels used for landing gear structures	European - CLEAN SKY 2
Optimized GEARs for friction reduction in power gearboxes	European - CLEAN SKY 2
Lightweight Al-Li Aerostructures	European - CLEAN SKY 2

3.5. RTD Projects

PROJECT	SUMMARY
CIDETEC (cont.)	
AIRPOXY	ThermoformAble, repairable and bondable smaRt ePOXY based composites for aero stru
HARVEST	Hierarchical multifunctional composites with thermoelectrically powered autonomous s
CTA	
ORBIT	AerOdynamic Rigs for VHBR IP Turbine. Experimental aerodynamics
OUTCOME	OUT of autoclave COMpositE manufacturing, wing and tail unit components and multifu
FLOWCAASH	FLOW Control Actuators at Aircraft scale manufacturing by SLM with high aerodynami
ARIAS	Advanced Research Into Aeromechanical Solutions. Aeroelasticity test
AVANWINGLET	RESEARCH IN TECHNOLOGIES OF ADVANCED MANUFACTURING FOR COMPETITIVE, FLEXIBLE AN
TASTE	Aerodynamic Technologies for Geared Turbofan
SPACECAP AÑO 2019	Development of the spatial technologies. space test technologies
CONAVAUTIN	Development of Advanced Control Technologies for Smart rigs. advanced control develo
ACTIMAT	Research and Development of new smart materials. Test technologies
SMARTRESNAK	SMART, ADAPTABLE AND DYNAMIC TOOLING IN THE AERONAUTICAL INDUSTRY 4.0
CODISAVA	Advanced distributed control for safety and energy efficiency of air transport
KONMUSAT	New Controlled Switches for Waveguide in Satellites. design of test rig for space compo
LIT-SENS	Development of smart products using new sensorization and lighting technologies. IT Te
LATIDO	Development of new systems for more efficient and reliable lubrication of aeronautical engine
EGILE	
NEWGENPAGB	Development of a power gearbox for a turbopropengine to be installed in future jets
ADDIMOT	New electric engine design based on AM process
APEM-AM	Inco 718 additive manufacturing process simulation and monitoring
NINFA	Metal AM componen certification
LUBEOFF	Effect of oil off condition on transmissions
AEROLUBE	Oil gerotor pumps CFD simulation
LATIDO	New multiphase oil pumps for aerospace industry
HI-PREST	no backlash and high reduction gearbox for ultra high presition positioning
EIBAR PRECISION CASTING	
HIPERTURB	Development of investment casting process of nickel superalloys with enhanced weldability
INEVITABLE	Optimization and performance improving in metal industry by digital technologies
CASTWELD	Aeronautical structures based on INCO 718 manufactured by investment casting
NANOTRAN	Development of processes and services for the implementation of nano-reinforcedmater
TURBTECH	Digitalization of the investment casting process for the development of low-pressure tur
GRUPO TTT	
NINFA	FA Suply Chain

	CALL
Structures	European-H2020
Structural health monitoring for the aviation industry	European-H2020
	European - CLEAN SKY 2
Functional design. Test technologies, STRUCTURAL TEST,	European - CLEAN SKY 2
Performance for using in Harsh environment	European - CLEAN SKY 2
	European- H2020
EFFICIENT PRODUCTION OF WINGLETS OF COMPOSITE MATERIA	National - CIEN
	National - RETOS Colaboración
	Regional - DFA - Basque calls
Development	Regional - DFA - Basque calls
	Regional - ELKARTEK- Basque calls
	Regional - ELKARTEK- Basque calls
	Regional - ELKARTEK- Basque calls
Component	Regional - HAZITEK - Basque calls
Technology, NDT Test technologies	Regional - HAZITEK - Basque calls
Tests using new methodologies of advanced design and monitoring	Regional - HAZITEK - Basque calls
	European - CLEAN SKY 2
	European - CLEAN SKY 2
	National - CDTI - Cervera
	National - CDTI - CIEN
	Regional - ELKARTEK- Basque calls
	Regional - ELKARTEK- Basque calls
	Regional - HAZITEK - Basque calls
	Regional - HAZITEK - Basque calls
	European - CLEAN SKY 2
	European - H2020
	Regional - HAZITEK - Basque calls
Materials for the transport industry	Regional - HAZITEK - Basque calls
Composite cast components	Regional - HAZITEK - Basque calls
	National - CDTI - CIEN

3.5. RTD Projects

PROJECT	SUMMARY
ITP AERO	
Clean Sky 2	VHBR Engine Intermediate Pressure Turbine Technology
ARIAS	Advanced Research Into Aeromechanical Solutions
TURBONOISE	Validation of improved turbomachinery noise prediction models and development of broadband noise
ENCOMPASS	ENgineering COMPASS
EMUSIC	Efficient Manufacturing for Aerospace Components Using Additive Manufacturing, N
BOOSTER2	Acquisition of basic compressor technologies
COLD SPRAY	High Speed Cold Filling Repairs for Nickel Base Alloys
SALUD	Sistema de Análisis Unificado para el Diagnóstico
JANO	Join ActioN towards digital TranfOrmation
FUTURALVE	Material and advanced manufacturing technologies for new generation high-speed turbine technologies necessary to design optimized components of high speed turbines and be
ENVIDIA	Virtual Environment for the Design and Manufacture of Aeronautical Turbines
ESCALITURB	Competitive technologies for aeronautical turbine hot structures. Develop the technology (more than 1000 components year) hot structures interturbine of the aeronautical engine
TALDEA	Turbinas de ALta velocidad: DEsarrollo de tecnologías de fabricación Avanzada. Develop future high-speed turbines of future aeronautical engines in segments of medium and h
KHEGAL AERONÁUTICA	
TECH4CUT	Machining optimization
LORTEK	
HYPROCELL	Development and validation of integrated multiprocess Hybrid PROduction CELLS for rap
FLOWCAASH	Development of Aero Engine Component Manufacturing using Laser Additive Manufact
ALFORAMA	Innovative Al alloy For aircraft structural parts using Additive MANufacturing technology
ECO-TECH	Development of innovative and ECO-friendly airframe TECHnologies from desing to man
HIPERTURB	Development of investment casting process of nickel superalloys with enhanced weldab
DALI	Demonstrator for Aircraft heat exchanger Llife prediction
PERFORM	European Periphery Teaching Factory of the Future on Additive Manufacturing
REDAMP	REal time monitoring of DED Additive Manufacturing Process for zero defect manufacturing
DIGIQUAM	Digitalisation of in-line quality assurance for additive manufacturing
AMANECO	Assessment of additive manufacturing limits for ecodesign optimization in heat exchan
HYPERCOG	Hyperconnected architecture for high cognitive production plants.
AMABLE	Development of Aero Engine Component Manufacturing using Laser Additive Manufacturing
DURABLE	Maintenance drones and robots to ehnhance renewable energy systems in the atlantic a
SAM	Sector Skills Strategies in Additive Manufacturing
MICROFORM	The use of microperforations with variable size in the external skin of the aircraft wings a Hybrid Laminar Flow Control (HLFC).

	CALL
	European - CLEAN SKY 2
	European - H2020
Development of novel design methods for fan stages with reduced weight	European - H2020
	European - H2020
Development of 'Net Shape HIP and Investment Casting'	European - H2020
	National - CDTI
Development of advanced materials and manufacturing processes able to manufacture them with better use of the raw material	National - CIEN
	National - MICIN
Development of technology to perform 100% reliably and in high production (from 10 to 1000) of the middle segment	Regional - HAZITEK - Basque calls
Development of advanced manufacturing technologies to produce high thrust	National - MICIN
	Regional - HAZITEK - Basque calls
Development of individualized laser-based production	European - CLEAN SKY
Development of manufacturing	European - CLEAN SKY
	European - CLEAN SKY
Development of manufacturing to improve aircraft life cycle environmental footprint	European - CLEAN SKY
Development of efficiency	European - CLEAN SKY
	European - CLEAN SKY
	European - EIT Manufacturing
	European - EIT Manufacturing
	European - EIT Manufacturing
Development of engines	European - H2020
	European - H2020
	European - H2020 - FoF
Development of area	European - Interreg
	European - Others
Development of technology that allows to reduce the complexity in the design of the wings with	European - H2020-CLEANSKY 2

3.5. RTD Projects

PROJECT	SUMMARY
LORTEK (cont.)	
ADDITool	Implementation of metal additive manufacturing in the world of tooling
CEFAM	Strategic program for the Training of Excellence in Additive Manufacturing of Metallic materials
NINFA	Promote research and development of solutions, systems and protocols that allow in maintaining the quality requirements of the current aerospace industry.
IN-SENSE	New generation of intelligent structures through the introduction of embedded sensors
OPTIFAN	Optimization of the Additive Manufacturing process of nickel-based alloys for aircraft engines
QUALIFAM	QUALITY ASSURANCE IN METALLIC ADDITIVE MANUFACTURING TECHNOLOGIES THROUGH VALUE CHAIN
CEMAP	Development of High Performance Ceramic and Metallic Materials for Advanced Manufacturing
DATAPRIN	Development of new technologies and tools that Accelerate the Transition to Intelligent Manufacturing
INSPECTA	A robust and automatable approach to critical joint and defect inspections
FACTORY 21	The factory of the future: flexible, digital and efficient.
HARITIVE	Development of a new manufacturing chain for high added value components using 3D printing in industrial sectors.
AM_AVANZA	New efficient additive manufacturing processes for the design of unique structures through 3D printing
SOLIDEX	Premium comprehensive solutions for highly demanding and highly demanding applications
PRODIGIOSA	Digital products for the technological impulse in the industry and new advanced services
TALDEA	High speed turbines: Development of advanced manufacturing technologies.
CONAN	Smart inspection for advanced zero defect manufacturing
OMNIJOIN	The adaptation of its production processes in the field of arc welding joining processes to 3D printing
MADE	Research and develop new materials and manufacturing routes to create a new generation of materials
HIGHTECH	Advanced technology for the development of new components and solutions aimed at e
MESIMA	
TALDEA	Development of advanced manufacturing technologies to produce future high-speed turbines
FAKTORIA	Development of advanced manufacturing technologies to produce future high-speed turbines
METALÚRGICA MARINA	
FAKTORIA	Material and advanced manufacturing technologies for new generation high speed turbines and be
RENISHAW IBÉRICA	
FUTURALVE	COMPLETED - Futuralve project is to create advanced material and manufacturing technologies for the aerospace sector. Throughout the project Renishaw is directly involved with the materials. Renishaw will also contribute to the metrology and part verification of the a winning 5 axis measurement system REVO® and on-machine contact scanning system S
3D Manufacturing Technologies	CATEC is a technical centre of excellence and aims to become, over the next few years, aerospace technologies. In this Centre Renishaw has installed its Ren AM500M, RenAM
Advanced Manufacturing Technologies	The objective is to develop advanced manufacturing technologies; these development centre also acts as an intersection of ideas and advancement for agencies and companies engines and structural components sector. The centre has several different manufacturing printing machine AM400.

	CALL
	European -Intereg Sudoe
Materials	National - CDTI Cervera CCTT
Industrialization more effectively, at a lower cost and	National - CDTI CIEN
in additive manufacturing	National- AEI Cluster
engine components	Regional - ELKARTEK - Basque calls
TOUGH THE OPTIMIZATION OF THE DIFFERENT STAGES OF THE	Regional - ELKARTEK - Basque calls
Manufacturing	Regional - ELKARTEK - Basque calls
Production	Regional - ELKARTEK - Basque calls
	Regional - ELKARTEK - Basque calls
	Regional - HAZITEK - Basque calls
3D AM for its validation in demonstrators in highly demanding	Regional - HAZITEK - Basque calls
through the use of advanced materials	Regional - HAZITEK - Basque calls
Applications	Regional - HAZITEK - Basque calls
Services	Regional - HAZITEK - Basque calls
	Regional - HAZITEK - Basque calls
to the macro-trend known as Industry 4.0.	Regional - HAZITEK - Basque calls
Production of electromechanical devices.	Regional - HAZITEK - Basque calls
Extreme service conditions	Regional - HAZITEK - Basque calls
Turbines: waterjet cutting and trimming	Regional - HAZITEK - Basque calls
Turbines: waterjet cutting and trimming	Regional - HAZITEK - Basque calls
Turbines. Development of advanced materials and manufacturing processes able to manufacture them with better use of the raw material.	Regional - HAZITEK - Basque calls
Technologies for the new generation of high-speed turbines and the development of new lightweight additively manufactured aerospace parts throughout the FuturAlve project by its award-winning SPRINT™.	National - CIEN - CDTI
Creation of a national and international R&D centre for developing AM 500M and AM 250 additive manufacturing machines.	Others: CATEC
How advanced level technologies can be quickly transferred to industry. The company works with capabilities, interests, and businesses in the aeronautical and space technologies, including Sprint, REVO and the metal 3D	Others: CFAA

3.5. RTD Projects

PROJECT	SUMMARY
SARIKI METROLOGÍA	
FUTURALVE	Advanced manufacturing and materials technologies for the new generation of high-
ABIO	Inspection, monitoring and new developments on metrology tools
SATLANTIS	
iSIM	iSIM integrated Standard Imager for Microsatellites. The objective of this project is to technical and business development activities. In particular, this project covers the de technology iSIM, including the optomechanical and electronic systems.
OPTISSE	The main objective is to develop a very high optical payload for small satellites for de
OMEGA	The main objective is to research and develop an innovative optical instrument (iSIM-12U) Observation Mission MANTIS (Mission Agile Nanosatellite for Terrestrial Imagery Services),
CubeSats	The main objective of this project is the development of a high-resolution multispectral which is designed from nanostructures for optical components (multispectral lenses and formed by the company and the CSIC IMN-CNM.
BIZKARGI	This is a business strategy project whose ultimate objective is to offer the market a very high applications that includes both the SATLANTIS payload and the entire satellite platform
CIBERSEGURIDAD	The objective of this project is to implement a CASB tool, thanks to which SATLANTIS and control of the main in cloud applications.
LUR	The objective of this project is to develop a low-orbit nanosatellite mission that will al can exploit for the benefit of citizens, the Basque economic sectors, and the diverse in camera for its integration into the EUSKALSAT satellite
IGELA	The objective of this project is to research and develop a new technology for Earth Ob instrument for the short-wave infrared spectral range.
LAMIA	Filters for multispectral images and image processing algorithms. This program fo advanced investments. LAMIA Project target is to increase the competitive advantage higher image process capabilities
KUBEKAM	Earth observation camera for Cubesat Standards This program focuses on small comp internationalisation of their activities. This project focuses on the development of pay
SENER AEROESPACIAL	
PERIOD	SENER Aeroespacial is part of the European consortium for PERIOD (PERASPERA In-Or by PERIOD will pioneer construction of major components such as antenna reflectors, replacements, directly in space. This is the precursor to future manufacturing of large seven European innovators, bringing their own expertise in fields such as robotic ope DFKI, EASN-TIS, GMV, GMV-SKY, ISISPACE and Space Applications Services.
HI-PREST	HI-PREST, Technologies for highly reliable mechanisms and sub-micrometric precision Basque companies, led by SENNER Aeroespacial and comprising the companies EGIL ULMA Embedded Solutions, is working together on a project to develop a high-perf other optical instruments

	CALL
speed turbines (Futurvalve). 3D inline inspection system	National - CIEN - CDTI
	Regional - HAZITEK - Basque calls
introduce the iSIM payload into the market. It includes both design, manufacture, assembly, integration and validation of the	European - SME Instrument
ence applications.	European- EDIDP Program
for the 12U CubeSat (qbee 12) nanosatellite for the European Earth which will respond to the specific needs of the Oil and Gas sector.	National - PID - CDTI
optical camera that can be integrated into CubeSats platforms, and d filters). In this project SATLANTIS is the leader of a consortium	National - Retos Colaboración
resolution standardized comprehensive solution for earth observation	Regional - 3i 2020 Program
will be able to mitigate the risk of data loss thanks to the visibility	Regional - Ciberseguridad Industrial 2020 Program
allow the Basque Government to have earth observation data that it interests of autonomy. In this project SATLANTIS provides the	Regional - HAZITEK - Basque calls
observation, which is a miniaturized, high-resolution optical	Regional - HAZITEK - Basque calls
focuses on small companies to help them drive innovation and ge of SATLANTIS cameras by including multispectrality and	Regional - Plan 2i BEAZ - Basque calls
panies to help them drive innovation, investments and loads for CubeSat satellite platforms	Regional - Plan 2i BEAZ - Basque calls
bit Demonstration) Project. The “orbital factory” envisioned assembly of spacecraft components and satellite payload structures in orbit. Airbus Defence and Space is leading a team of ration, virtual reality, and in-space assembly: SENER Aeroespacial,	European Union - H2020
on in critical applications and environments. A consortium of six E Mechanics, FAGOR Automation, IBARMIA Innovatek, KORTA and formance scanner, with applications in telescopes, cameras and	Regional - HAZITEK - Basque Calls

3.5. RTD Projects

PROJECT	SUMMARY
SENER AEROESPACIAL (cont.)	
ACTECA	ACTECA - Accelerators and Associated Technologies for Large Scientific Facilities. Inputs for applications in particle accelerators and more direct application in the L
HELICON PLASMA THRUSTER	Innovative technology for electric in-Space propulsion that could be a competitive a awakes the interest of several companies and institutions, including ESA. Developed III de Madrid (UC3M). To date, SENER and the UC3M have manufactured and start up evolved to a new engineering model to certify the system prior to its in-flight d
APOS-UE	Project on indoor navigation of soldiers or small mobile platforms. SENER Aeroespacia oped to provide the navigation solution.
AURORA	The AURORA project provides a suite of European tools for the development and va interoperability and the exchange of information on the platform. Simplifying the p software programming times and lower production costs. The auto-coding in-flight commercial missions, including the telecommunications market and the so-called N
EROSS	EROSS (European Robotic Orbital Support Services) objective is to demons trate the GEO satellites, enabling a large range of efficient and safe orbital support services. T on-orbit servicing spacecraft (chaser) to perform rendezvous, capturing grasping, b (target) provisioned for servicing operations including refuelling and payload trans
ET PACK	Satellite de-orbiting system, based on a space tether
HIPATIA	HIPATIA (Helicon Plasma Thruster for In-Space Applications). The Spanish scientific t Airbus, the National Centre of Scientific Research, both in France, and the company will validate the performances and operation of a new electric space propulsion tec small space platforms: the Helicon Plasma Thruster (HPT), testing the functioning of
MADE	Researching and developing new materials and manufacturing routes (additive) to cr actuators for space applications.
MFOC	Development of technology, methodology and applications for the use of MPSoC (Mu SENER Aeroespacial, will validate the proposed technological concept, its potential an flight equipment.
ARCO	Development of a convoy of vehicles with mixed functionality (tele-operated and a navigation unit. The project aims to obtain the requirements definition of a military and to reach a TRL5/6 demonstrator.
NEREA	NEREA (NON-EXPLOSIVE RELEASE ACTUATOR). Demonstrate the technological validity as well as the functionality of the basic design with different component materials. Du activities to bring the actuator to a TRL 8, i.e. to make the device fully qualified for a re
RF filters in Q/V bands (COM-MAD development)	Development of RF filters in Q/V frequency bands: three filters with different topolo for the next generation of commercial satellites using these new frequency bands. T of the filters proposing more compact solutions, robust to manufacturing tolerance improving their assembly

	CALL
Development of a high power RF summing cavity, with 160 DONES /IFMIF projects (National Fusion Laboratory).	National - CIEN
Alternative to the current thruster technologies and therefore led by SENER as a joint R&D project with the Universidad Carlos III to a prototype of the helicon plasma thruster, now being in demonstration, which could take place in 2022.	European - ESA - GSTP
SENER is responsible for the data fusion part of the sensors development.	European - ESA - GSTP
Validation of auto-coding in-flight software that optimizes the process yields a more reliable solution, significantly shorter development time. The software is applicable in both scientific missions and NewSpace.	European - H2020
SENER is responsible for the European solutions for the Servicers and the Serviced LEO/LEO+. The project will assess and demonstrate the capability of the rendezvous and manipulating of a collaborative client satellite for repair/replacement.	European - H2020
SENER is responsible for the European solutions for the Servicers and the Serviced LEO/LEO+.	European - H2020
SENER team SENER Aeroespacial-UC3M leads a consortium with Fraunhofer IPT and Advanced Space Technologies in Germany. This consortium is developing a technology that could be used in various types of satellites or as a component of the new prototype.	European - H2020
SENER is responsible for the development of a new generation of electromechanical devices: electric actuators.	Regional - HAZITEK - Basque Calls
SENER is responsible for the development of Multi-Processor System on Chip) systems. The Project, led by SENER, aims to study and its advantages for the use of this type of system in on-board systems.	Regional - Open Innovation Program - Madrid Calls
SENER is responsible for the development of autonomous systems. SENER Aeroespacial is responsible for the development of the product (following the requirements of the Spanish Army).	National - Spanish Ministry of Defense
SENER is responsible for the study of the proposed concept for a non-explosive release actuator, during the year 2019, it is intended to carry out the necessary tests for a real flight application.	Others
SENER has designed technologies that have been designed from flight equipment specifications. The objective has been to analyze and measure the behavior of the systems and less complex by dispensing with tuning screws, thus reducing the weight.	Others

3.5. RTD Projects

PROJECT	SUMMARY
SENER AEROESPACIAL (cont.)	
KA-band SSPA for active antennas	Development of a Ka-band SSPA for active antennas in the telecom market. Based on Monolithic Integrated Circuit) capable of providing 5W output power with 45% efficiency amplifier modules that form a Ka-band active antenna. This device is oriented to the key element within the new satellite architectures that allow flexibility in orbit, both increase its efficiency or capacity.
SMART CULTURE	Development of advanced equipment for the incubation and inspection of Petri dishes to the use of innovative concepts, two patents have been filed, and the use of artificial intelligence shorter time than current equipment, with a direct impact on reducing the mortality in microbiology laboratories, continuing the path opened by Autoplak.
SADM POWER ROTARY JOINT	Detailed design, manufacture, assembly and functional testing of a solar panel pointing detailed design of a power and electrical signal transmission device.
SISTEPLANT	
OASIS	Nanomaterial manufacturing process industrialization (Buckypapers). Open Access Si composite materials and components. Scaling up of 4 pilot plans (2 in the Basque Country)
PLATOON	Smart Maintenance and Failure Prediction on HVAC Elements
MAS4AI	Smart process and real time regulation of manufacturing process
ZEROEHUN	Shopfloor Integration Platform for Manufacturing Intelligence (Secure, Real-time)
NIERBIMO	Installation Maintenance and Operation BIM Integration for Prisma
ALUJOINT	Zero defects Manufacturing in multi-material welding process
GEVO	Intelligent Plant Assistant for Manufacturing Intelligence
ePROMAT	Large Dimension Composite Manufacturing Cell
TECNALIA	
OUTCOME PROJECT/ CONSORTIUM	Out of autoclave composite manufacturing, wing and tail unit components and m Out of autoclave composite manufacturing, wing and tail unit components: Adv aluminium alloys
IDEN	Intelligent Distributed Electrical Network
PHIVE	Development of power electronic technologies for >1kV aerospace applications
ERICE	Super hydrophobic and erosion resistant coating for turbine scroll and downstream
FASELAG	FAil-Safe Electro-mechanical actuation for LAnding Gear: development of an electrom main and nose landing gears for future SMALL A/C. Development of ECU HW&SW
VALEMA	Validation tests of electromechanical actuators and its dedicated control units at TRL
EMA4FLIGHT	Development of Electromechanical Actuators and Electronic control Units for Flight C
HFLE	Hybrid Fixed Leading Edge. - Development of RTM tool for leading edge with HLFC system - RTM process automation
SOFOCLES	Smart and Flexible Clamping solutions for Sealing
FLEXGAN	K-band GaN-based SSPA for flexible payloads and multicarrier operation for 5G satellit
CURE	Copernicus for Urban Resilience in Europe

	CALL
on Gallium Nitride (GaN) technology, a MMIC (Microwave ciency is being developed to be used in each of the power e aerospace market for Telecommunications applications, as a n in the antenna pointing and in the use of the spectrum to	Others
hes, for the detection and identification of pathogens. Thanks ial intelligence allows results to be obtained in a much y rate of infectious diseases. The equipment is oriented to	Others
ng mechanism for satellites, focusing by 2019 on the basic and	Others
ngle entry point for scale-up of Innovative Smart lightweight ntry, 1 in Patras - Greece and another in Varsaw - Poland)	European-H2020
	European-H2020
	European-H2020
ible)	Regional - HAZITEK - Basque Calls
	Regional - HAZITEK - Basque Calls
	Regional - HAZITEK - Basque Calls
	Regional - HAZITEK - Basque Calls
	Regional - HAZITEK - Basque Calls
multifunctional design. CORE PARTNER OF ITD AIRFRAME - anced preforming and RTM - Hot stamping of innovative	European - CLEAN SKY 2
	European - CLEAN SKY 2 - SYS
	European - CLEAN SKY 2 - SYS
pipe	European - CLEAN SKY 2 - SYS
mechanical actuation system (EMAS) for extension-retraction of	European - CLEAN SKY 2 - SYS
6 level. Development of ECU HW&SW	European - CLEAN SKY 2 - SYS
ontrol Systems. Development of ECU HW&SW	European - CLEAN SKY 2 - SYS
	European - CLEAN SKY 2 - LPA
	European- EIT Manufacturing
te concept	European- H2020-IL-LEIT-SPACE
	European- H2020-IL-LEIT-SPACE

3.5. RTD Projects

PROJECT	SUMMARY
TECNALIA (cont.)	
AMULED	Air Mobility Urban Large Experimental Demonstrations
AEROEMA	Electromechanical Actuation for Flight Controls. Development of ECU SW & HW, Model Ba
PLASTAIR	New aeronautical components of thermoplastic compound through highly efficient fo
AVANWINGLET	Advanced manufacturing technologies and the optimization of media and processes
CODISAVA	Advanced distributed control for air transport safety and energy efficiency
HASI4.0	Flexible, digital, connected and sustainable aeronautical manufacturing factory
HEGALAK	Hypersustaining surface for the wing of the future
DRYDRAPE	Installation for hot forming of dry fiber preforms
TEKNIKER	
HYPER-DRILL	Development of a laser micro-drilling system for large-sized Ti panels for the aeronau
STIMULANT	Surface integrity in high performance hybrid machining for super critical alloy aircraft
ASSALA	Advanced Simulation Solutions Applied to Quality Control of Laser Deposited Metals
LiTRAS	Linear Innovative Thrust Reverser Actuator System
RECYCOMP	Development of equipment for composite recycling process of uncured material
FLUIDER	Real-time sensors for monitoring fluid contamination from electro-actuators
INNOTOOL	Development of Thermoplastic press-forming Tool for Advanced Rear End Closing Fra of the Advanced Rear End Prototype
WEIBAL	Development of an innovative system for measuring the weight and unbalance of an
EUCoM	Development of new standards for the evaluation of the uncertainty of geometric me
LAVA	Metrology applications for high volume applications
MULTIPOINT	Multi-beam femtollaser system for high-performance micro-drilling of HLFC struc
i-TRIBOMAT	Intelligent Open Test Bed for Materials Tribological Characterisation Services
MadebyEurope	Added Value Manufacturing KIC
DIMAER	Development of design and manufacturing technologies to produce special DiaMono
ESCAPHIB	Structures and systems in tail for a hybrid propulsion airliner
LUBRINTEL	New intelligent lubrication systems for metal processing
gear-UP	INVESTIGATION of the SCALABILITY of CERTAIN KEY POST-PROCESSES to IMPROV th AIRCRAFT ENGINES
PROCODA	HIGH-VALUE PROCESSES BASED ON KNOWLEDGE AND DATA
ELKARBOT	New functionalities in flexible robotics that promote the implementation of robots in
R-COMPOSITES 4.0	R-COMPOSITES 4.0
ABIO	Abio: Smart Manufacturing
FAKTORIA	Sensorized tooling for machining
HEGALAK	High-Cadence Hyper-lift Surface for the Wing of the Future
GLACIER	Development of a sub zero SMART cooling system to optimize the machining of comp
LEMAK	New structures in Sandwich material for High Cadence Rudders for the Empennage of
HEATING	Induction carbon fiber heating feasibility study
EMATEST	EMA bench tests

	CALL
	European- H2020-JTI-SESAR
ased Design, Integration , tuning and validation of complete EMA	National - CIEN
orming processes	National- CERVERA
to produce configurations of composite material winglets.	National- CIEN
	Regional - Elkartek
	Regional- Hazitek
	Regional- Hazitek
	Regional- Hazitek
tical sector	European - CLEAN SKY 2
t engine parts	European - CLEAN SKY 2
	European - CLEAN SKY 2
me Prototype and Tooling 4.0 for Assembly and transportation	European - CLEAN SKY 2
aircraft	European - CLEAN SKY 2
asurements in the industry.	European - H2020
	European - H2020
tures	European - H2020
	European - H2020
	European - H2020
l tool for the AERonautical sector	National-CDTI-CIEN
	National-CDTI-CIEN
	National-CDTI-CIEN
he RELIABILITY, LIFE AND EFFICIENCY of FUTURE REDUCERS of	Regional - ELKARTEK - Basque calls
	Regional - ELKARTEK - Basque calls
the Basque industry	Regional - ELKARTEK - Basque calls
	Regional - HAZITEK - Basque calls
	Regional - HAZITEK - Basque calls
	Regional - HAZITEK - Basque calls
posite and thermoplastic fibers	Regional - HAZITEK - Basque calls
f the Future	Regional - HAZITEK - Basque calls
	Others
	Others

3.5. RTD Projects

PROJECT	SUMMARY
TEKNIKER (cont.)	
FINGERPRINT INMAPA	Fingerprint implementation at INMAPA
ADDINVAR	Feasibility study of the Invar 36 tool manufacturing process using laser technol
DDV Motor	Linear force motor for Direct Drive Servovalve (DDV)
COMET-2020	Development of solid lubricants for space applications
CLEAN-US	Integration of cleaning equipment without immersion for micro-perforated sh
GEHIKUNTZA-FDM	Development of a head for the additive manufacturing of continuous fiber reinf
GENEFAB2020	Generation of knowledge in production processes and means
WEC	
SELESTUR	New product family for dynamic sealing inter-stages turbine
ESCALITURB	Advanced forming, welding processes for hot structures on Turbines
CFAA Projects	Advanced welding processes
WOLCO	
TALDEA	Development of advanced Cutting-Tools
FACTORIA	Development of advanced Cutting-Tools
univ. TECNUN	
AEROLUBE	RESEARCH on the INFLUENCE of CAVITATION, LEAKS and GEOMETRIC DEV AERONAUTICAL ENGINES
PIBA55	Obtaining Noise Maps Using a Microphone Array Network Using Spatial E
CODISAVA 2	Advanced Distributed Control for Air Transport Safety and Energy Efficient
univ. MONDRAGON UNIBERTSITATEA	
SURFNANOCUT	Surface engineering through machining focused on materials used in aeronauti
MECAERO	Development of Test-benches of high speed linear machining for the analysis o validation of predictive cutting processes models
LUBEOFF	Research on the influence of lack of lubrication in aeronautical transmissions and dev
SMAR3NAK	Adaptive, intelligent and dynamic tooling in the aeronautical industry 4.0
UDITURN	Determination of the process window for turning the nickel alloy Udimet 720 Li
univ. UPV/EHU	
INTER-Q	Interlinked process, product, & data quality framework for zero defect manu fac AI-driven optimization tools to assure the quality in smart factories. Main results:
HUC	Development and validation of a powder HIP route for high temperature Astrol sinterizado para fabricar carcacas de turbinas.
PARADISSE	A Productive, Affordable and Reliable solution for large scale manufacturing of Subtractive processes with high Efficiency . The overall objective of PARADDISE stakeholders of manufacturing value chain t he knowledge and the tools for cor and Machining (milling and turning). Additive and subtractive manufacturing p
ADAM^2	Analysis, Design, And Manufacturing using Microstructures. It is proposed a u Analysis, Design, And Manufacturing using Microstructures produced by multi lead to scientific-technological development that impacts CAD and tool manu ploitation of heavy materials between an order of magnitude to two orders, in

	CALL
	Others
ology	Others
	Others
	Others
sheet metal	Others
forced polymer structures	Others
	Others
	Regional - ETORGAI - Basque calls
	Regional - HAZITEK - Basque calls
	Others: CFAA
	Regional - HAZITEK - Basque calls
	Regional - HAZITEK - Basque calls
VIATIONS on the EFFICIENCY of future LUBRICATION systems for	Regional - ELKARTEK - Basque calls
estimation and Distributed Consensus	
cy	Regional - ELKARTEK - Basque calls
cs and automotive: machining process focused on the material	National -RETOS
f the condition of surface integrity of aeronautical alloys and	Regional - ELKARTEK- Basque Calls
velopment of advanced solutions to survive off-design conditions	Regional - ELKARTEK- Basque Calls
	Regional - ELKARTEK- Basque Calls
based on finite element modeling and its experimental validation	Regional - PIBA- Basque Calls
ufacturing. Digital solutions, intelligent systems, hybrid digital twins and s: use of blockchain and radical quality testing techniques	European - H2020 FoF-11-2020
py to manufacture Ultrafan® IP Turbine Casings. Un nuevo proceso de	European - CLEAN SKY 2
metallic components by combining laser-based ADDitive and project is to rationalize, to structure and to make available to the mbining two antithetical processes: Laser Metal Deposition (LMD) processes .	European - H2020 - FoF
nified manufacturing pipeline that will focus on all stages involving i-material 3D printers. Main results: The results of this project will ufacturing European markets and are expected to reduce the ex- volume.	Eusopean - H2020-FE- TOPEN-2018-2019-2020-01

3.5. RTD Projects

PROJECT	SUMMARY
univ. UPV/EHU (cont.)	
JANO	Joint Action towards Digital Transformation. Apply digital transformation for the development of Digital business, the Intelligent factory and Connected product. Main results: Digital t
5G-Euskadi	Pilot for 5G technology. The SN4I (Smart Networks for Industry) deployed is being u case. Main results: Deploy 5G sensors and MEC based applications and evaluate per
TASTE	Aerodynamic technologies for next generation of geared turbofans. Rigs, com pressor and t Main results: designs and processes for components to be used at CTA and LIFT.
ITENEO	A global approach to improve the manufacturing of casings for the new aero engi wave of engines for aircrafts (NEO). Main results: High-feed turning and turn-milling Cryogenic cooling on Ni-Co alloys. Polishing by robotic polishing and final check o
ENVIDIA	Virtual Environment of Design and Manufacturing of Aeronautical Turbines. Modeling Leading to the concept of Virtual Engine, and allowing to migrate to a completely new economically viable way.
ROTOSEAL	A new approach to the production of segments and seals for rotary machines . Welding and Optimised processes for several seals and segment of different engine programs.
FAKTORIA	New technologies and processes of Basque Manufacturing supply chain companies fo technologies for future turbines related with Ultrafan new aircraft engine. Main result
COMPLETER	Components for test bench elements of critical system . A new process for production Main results: A new industrial process with rect impact in turbine and compressor con
BEATRICE	High-performance broaching tools for new transport systems . Optimization of broa conditions. Main results: new broaching tools for several sectors, automotive and ae
ABIO II	Development of machine and systems for competitive Manufacturing of aeronautical to improve OEE in aeronautical production. Main results: software for smart control o

	CALL
Development of key technologies oriented to put into action the twin, Process predictive models, predictive maintenance	National - CIEN
Used as the pre-deployment scenario for the Industry 4.0 use performance.	National - Red.es
Turbine components for next testing programs of high-speed engines.	National - Retos Colaboración
Engines. Improving manufacturing technologies used in the next modelling, control by optical means.	National - Retos Colaboración
Design and simulation of key processes for high speed turbines. New engine configuration in a safe, robust, efficient and	National - Retos Colaboración
Advanced EDM of seals and other segments for turbines. Main results:	Regional - HAZITEK - Basque calls
Research for next future high-speed turbines. Manufacturing processes: machine and optimised processes for 2030 engine programs.	Regional - HAZITEK - Basque calls
Production of complex components for high-speed turbines component manufacturing.	Regional - HAZITEK - Basque calls
Researching tools, substrates, geometry, coatings, in high-speed aeronautics .	Regional - HAZITEK - Basque calls
Production of components. Optimization of machines and production lines of production lines.	Regional - HAZITEK - Basque calls

68 **AEROSPACE MEMBERS**

4 **TIER 1:**
Aerostructures - Engines - Space

9 **MID-CAPS**
Subassys - Equipment - Advanced Services -
Engineering

39 **SMEs**
Components, Parts, Special Processes,
Tooling, Advanced Services, Equipment... for
Aerostructures, Engines, Systems and Space

1 **AEROSPACE RTD CENTRE:**
Certification Testing and RTD (3 Labs)

4 **RTD ENTITIES**
with 8 RTD labs with aerospace activities

4 **UNIVERSITIES**
ETSIB: Master in Aeronautics, Master in Space

164 **FACILITIES AROUND THE WORLD**
82 in the Basque Country
57 in the rest of Spain
25 abroad: Brazil, China, Germany, India,
Malta, Mexico, Poland, Romania, UK, USA

7 **CLUSTER ALLIES:**
M&A - Consulting - Risks & Insurance - Intellectual
Property - Legal & Tax - Financing - Purchasing

**Members aggregated TURNOVER and EMPLOYMENT:
1,874 million € and 13,766 people**

2020 Geographical breakdown	Turnover (M€)	△ 2019	Employment	△ 2019
Basque Country	782	-19,1%	4,750	-9.4%
Rest of Spain	878	-39,3%	6,800	-13.5%
Rest of the World	214	5,6%	2,216	2.1%
TOTAL	1,874	-28,3%	13,766	-9.9%

2020	M€	% over Sales	Average % over Sales since 1993
MEMBERS RTD investment	102	5.4%	13.8%
MEMBERS Exports	1,397	74.5%	69.3%

CLUSTER DIMENSION (Facilities in Basque Country)

1.1%	of the Basque GDP (*)	5.3%	of the Basque Industrial GDP (*)	2.5%	of the Basque Industrial EMPLOYMENT (*)
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(*) EUSTAT 2020

/// Facts & Figures 2020



UltraFan



A220



H145

TURNOVER ACCORDING TO SUBSECTORS

AEROSTRUCTURES	48%
ENGINES	44%
SYSTEMS & EQUIPMENT	4%
SPACE	4%

EXPORTS ACCORDING TO COUNTRIES

UK	34%
USA	19%
GERMANY	17%
FRANCE	13%
CANADA	5%
OTHER COUNTRIES	12%

RTD EFFORT

Auto-Financing	73%
Public Support	27%

202 RTD Projects active in 2020

11 Members participating in
Clean Sky 2

PEOPLE

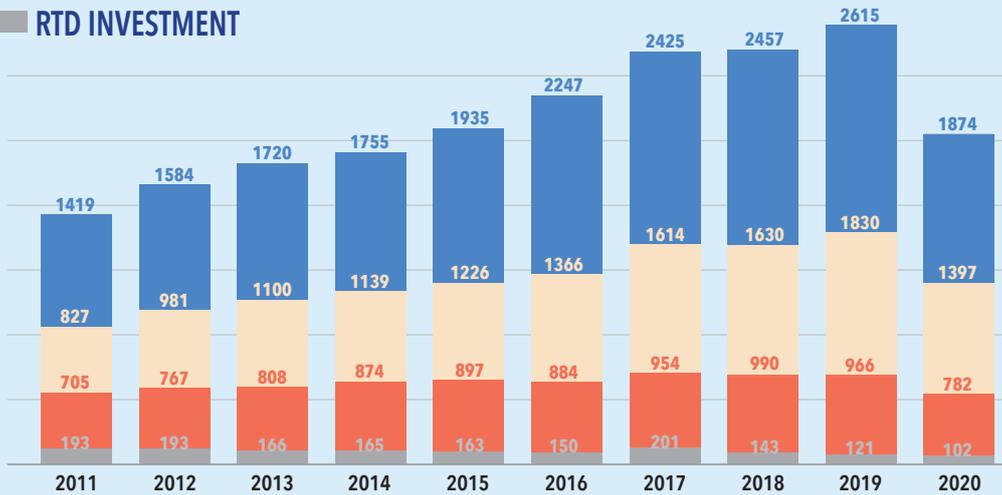
Employment According To Qualification

	TOTAL	FEMALE
Managers Engineers & Graduates	39%	55% (1,819)
Technicians, Administration and Others	30%	35% (941)
Manual Workers	31%	10% (293)
Total FEMALE Employment		22% (3,053)

/// Facts & Figures 2020

EVOLUTION IN M€

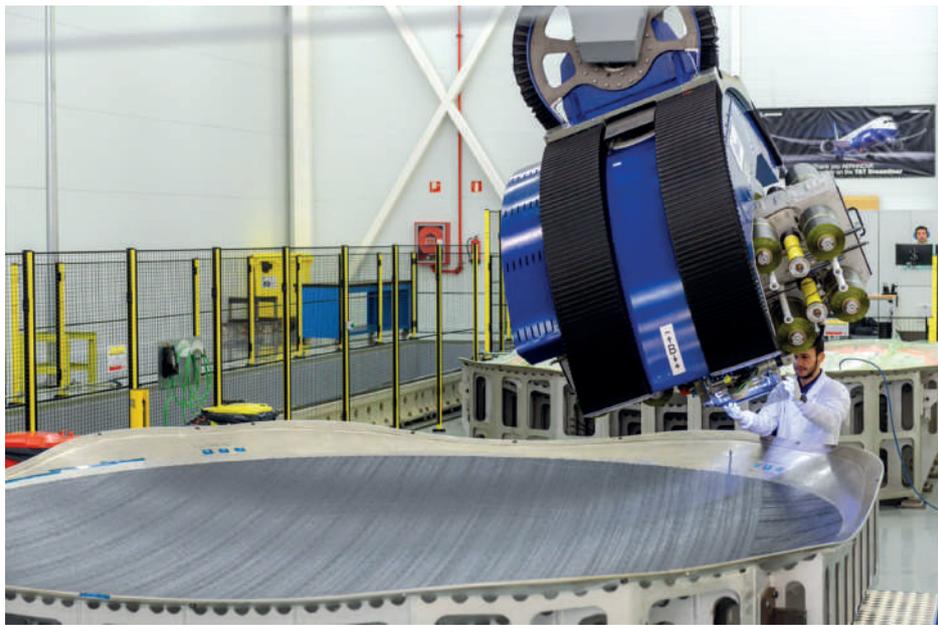
- TOTAL AGREGATE TURNOVER
- EXPORTS
- TURNOVER GENERATED IN THE BASQUE COUNTRY
- RTD INVESTMENT



EVOLUTION: PEOPLE

- TOTAL EMPLOYMENT
- EMPLOYMENT in the BASQUE COUNTRY
- PERSONNEL WITH RTD ACTIVITIES





4. ACKNOWLEDGEMENTS

We conclude this 2020 Annual Report with two words for all our Members: THANKS! and CONGRATS!

Thank you for hanging on in there with us; despite the immense challenges of this period, you have given us your wholehearted support.

Congratulations on hanging on in there, working non-stop. At this time of uncertainty you have shown that with tenacity and creativity you can seek new ways and solutions to maintain the vitality of our sector.

As for us, we are working to be worthy of you and continue to do our best to provide you with added value. We want to be one more pillar to support your recovery.

All of us who make up this ecosystem of entities and people believe that the Cluster provides an indispensable substrate for the growth of the sector.

In this way we can get back on track towards a sustainable and equitable future, as we are a lever of quality employment, a generator of clean and neutral technologies and a creator of wealth.



Ana VILLATE
Managing Director

ESKER ONEZ

2020ko Urteko Txosten hau gure bazkide guztiei zuzendutako bi hitzekin amaitu nahi dugu: ESKERRIK ASKO! ETA ZORIONAK!

Eskerrik asko gurekin hor jarraitzeagatik; aldi honetan, zailtasunak handiak izan diren arren, leial lagundu diguzue.

Zorionak atsedetik gabe lanean jarraitzeagatik. Ziurgabetasun-une honetan, erakutsi duzue gai zaretela imotasunez eta sormenez bide eta irtenbide berriak bilatzeko, gure sektorearen bizkortasunari eusteko.

Gure aldetik, lanean aritu gara, zuen mailan egoteko eta zuei balioa ematen jarraitzeko. Zuen susperraldirako lagungarri izango zaizuen pieza izan nahi dugu.

Ekosistema hau osatzen dugun guztiok (erakundeak eta pertsonak) uste dugu klusterrak sektorea hazteko ezinbestekoa den substratua ematen duela.

Horrela, etorkizun iraunkor eta orekatu bat lortzeko bidean aurrera egin ahal izango dugu, kalitatezko enpleguaren palanka garelako, teknologia garbiak eta neutroak sortzen ditugulako eta aberastasuna sortzen dugulako.

Ana VILLATE
Zuzendaria

AGRADECIMIENTOS

Concluimos este Informe Anual 2020 con dos palabras para todos nuestros Socios: ¡GRACIAS! y ¡ENHORABUENA!

Gracias por seguir ahí con nosotros; a pesar de las inmensas dificultades de este periodo, nos habéis apoyado incondicionalmente.

Enhorabuena por seguir ahí trabajando sin descanso. En este momento de incertidumbre habéis demostrado que con tenacidad y creatividad podéis buscar nuevos caminos y soluciones para mantener la vitalidad de nuestro Sector.

Por nuestra parte, trabajamos por estar a vuestra altura y continuar poniendo todo nuestro empeño en daros valor. Queremos ser una pieza más en la que apoyaros para vuestra recuperación.

Entre todos los que conformamos este ecosistema, entidades y personas, creemos, que el Cluster aporta un sustrato imprescindible para el crecimiento del Sector.

De esta manera podremos retomar el avance hacia un futuro sostenible y ecuánime, ya que somos palanca de empleo de calidad, generador de tecnologías limpias y neutras y creación de riqueza.

Ana VILLATE
Directora

HEGAN participated in the international project co-financed by INTERREG SUDOE:

BLOCK4Coop.

Cooperation to promote and implement BLOCKCHAIN technology in the development of Industry 4.0



HEGAN participated in the international project co-financed by NAEN:

F-COMP.

Functional composites for the aerospace industry



This publication is co-financed by the Basque Government



Photos Courtesy: AIRBUS, AIRBUS HELICOPTERS, BOEING, DAVE GRANLUND, ESA, PRATT & WHITNEY and ROLLS-ROYCE



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