Business plan and Growth potential

ACSL Ltd.
2021/12/24

Company Outline

Industrial drone manufacturer

Corporate Name	ACSL Ltd.
Representative	Satoshi Washiya（President and COO）
Establishment	2013 November
Location	Hulic Kasai Rinkai Building 2F, 3-6-4 Rinkaicho, Edogawa-ku, Tokyo 134-0086, Japan
Capital	About 4,500 mn JPY（as of 2021 September）
Number of Employee	68（as of 2021 September）
Description of Business	Manufacturing and providing industrial drone and providing solution service for automation with autonomous technology

Megatrend in Japan

With its declining birthrate and aging population, Japan is expected to be one of the first countries in the world to face a variety of social issues, and the imbalance between supply and demand of labor is fast approaching

Demand for labor force

50-yrs old infrastructure[1]

x 2.5

(2018~2023)

Logistics flow[2]

x 5

(1988~2018)

Supply of labor force

Population decline rate[3]

-26%

(2020~2060)

Labor force[4]

-35%

(2020~2060)

1: Ministry of Land, Infrastructure and Transport, "Social Infrastructure Today and in the Future, Social Infrastructure Today and in the Future
2: Ministry of Land, Infrastructure, Transport and Tourism, "Fiscal Year 2018 Delivery Service Performance Data" (Japanese only)
3: White Paper on Aging Society 2019" by the Cabinet Office
4: White Paper on Aging Society (Entire Version), Cabinet Office, Government of Japan

MISSION

Liberate Humanity Through Technology

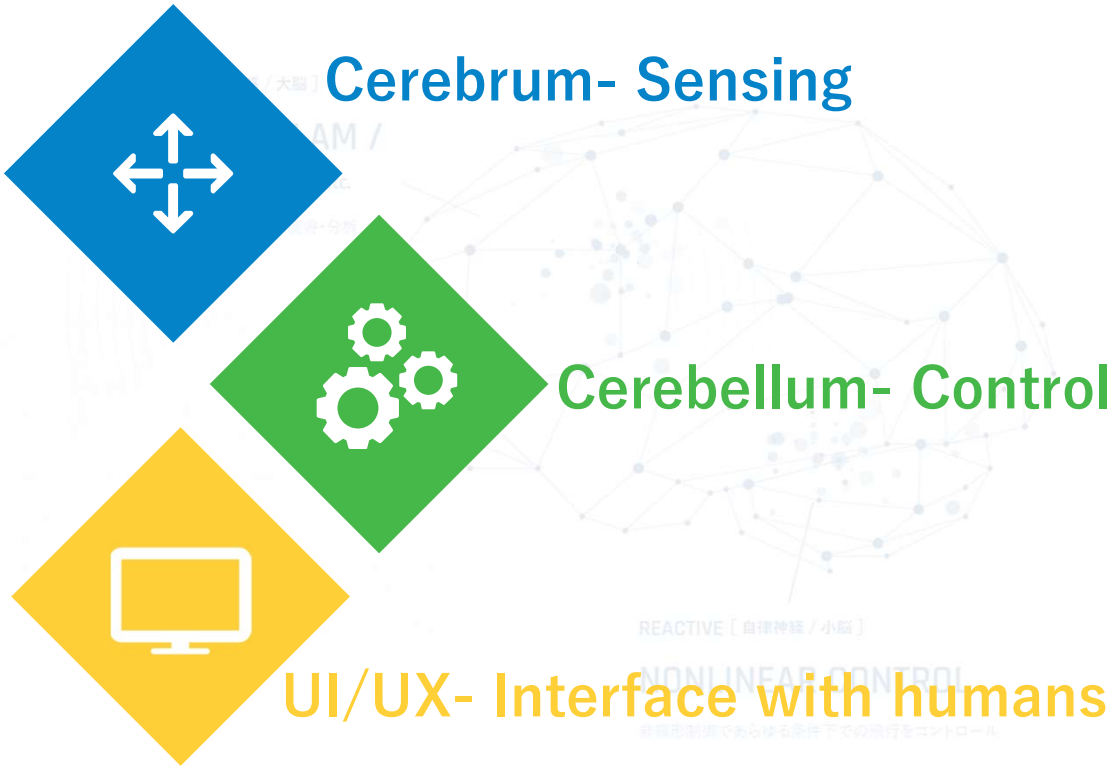
VISION

Revolutionizing social infrastructure
by pursuing cutting-edge robotics technology

Core competency of ACSL

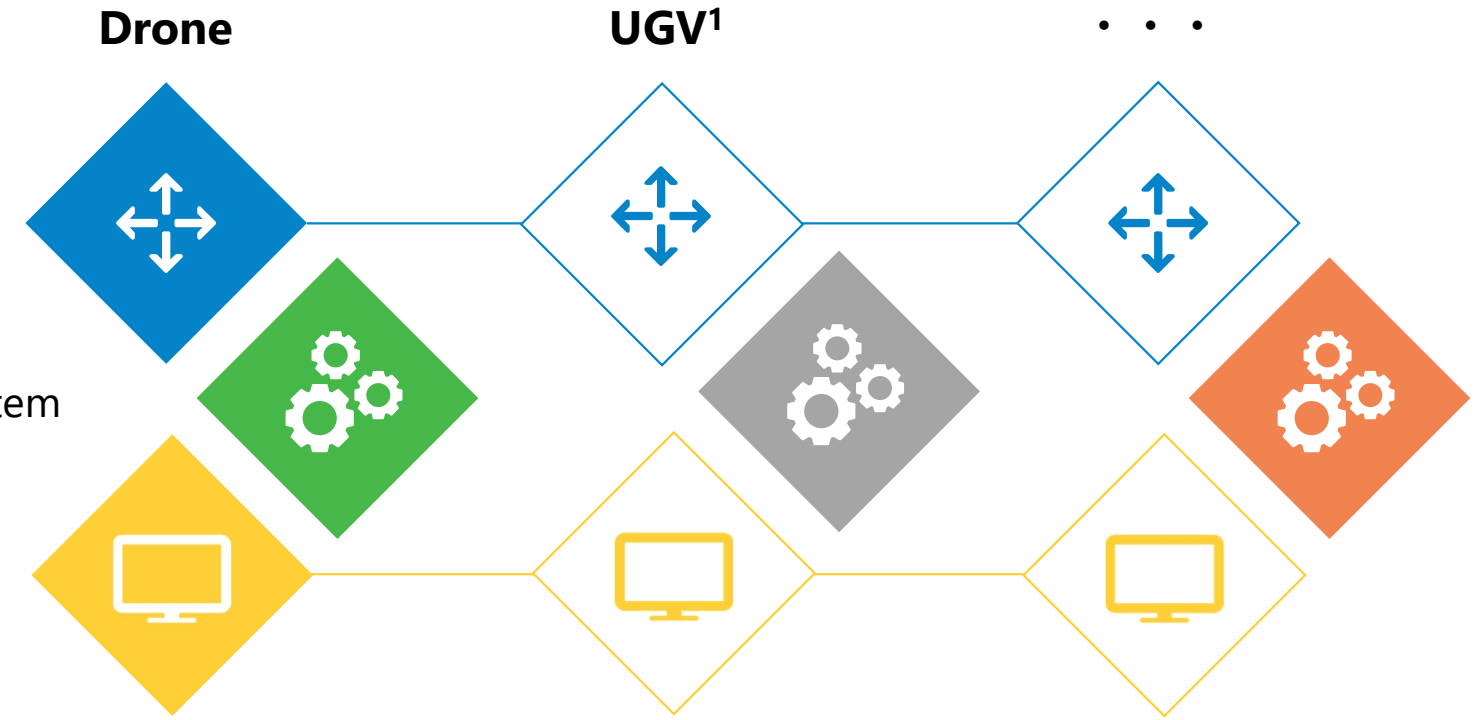
ACSL's core technology is a proprietary autonomous control system that can be adapted to a variety of robotics, and ACSL is working to mature technologies related to its autonomous control system, with industrial drones as a first application

Autonomous control system



Scalability of autonomous control systems

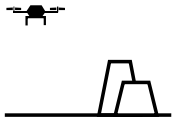
After maturing the autonomous control technology with the industrial drone field as the first application, its technology will be adapted to other robotics in order to promote efficiency improvement and unmanned operations in other fields



1: Unmanned ground vehicle

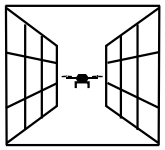
Movement in 3D space + **Remote Control/Automation**

"Void"

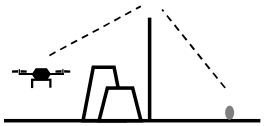


Outdoor

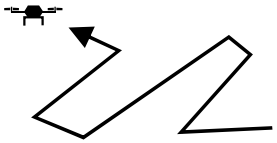
Semi-Indoor
(e.g., Tunnels)



Indoor
(e.g., factories)



Remote Control
(4G, 5G / radio communication)



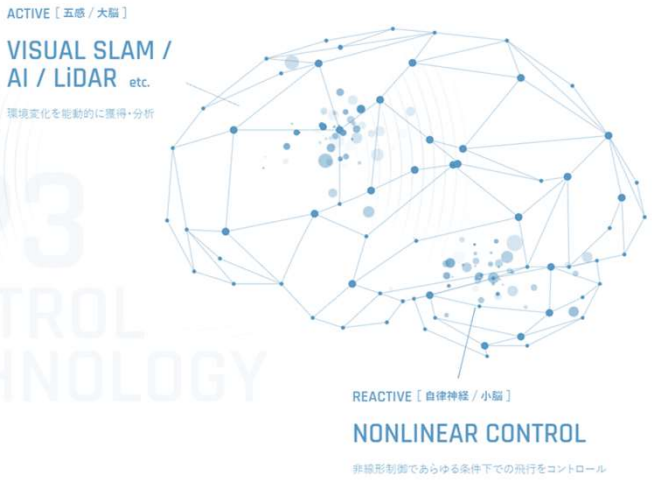
Autonomous Flight
Automated Controls

ACSL is an industrial drone manufacturer pioneering drone market

ACSL is an industrial drone manufacturer developing application-specific drones through site visits, discussions, and demonstrations with customers to replace and improve operations, using proprietary autonomous control as its core technology

ACSL core technology

The proprietary control technology consists of the “cerebrum”, which actively grasps the surrounding environment, and the “cerebellum”, which controls flight in any environment



Knowledge through customer projects

Develop specific drones through verification of technical and economic requirement for each applications through discussions with customers and demonstrations in actual environments

日本郵便 / docomo / ほくでん / NJS / 関西電力 power with heart / accenture / yec / ANA / UNISYS / TAISEI / 未来を創る現場力 西松建設 / 建設電気技術協会 AETELI / MORITA 株式会社モリタ

Business activities of ACSL

At present, main business is demonstration and sales of platform drones. In order to evolve from a "prototype factory" to respond to new demand in the market, ACSL is are promoting the development, mass- production, and sales of application-specific drones

Solution development

Sales of platform/evaluation drones

Adaption to actual environment
(Sales of platform drone)

Demonstration

Proof of Concept
(Verification of drone usage)

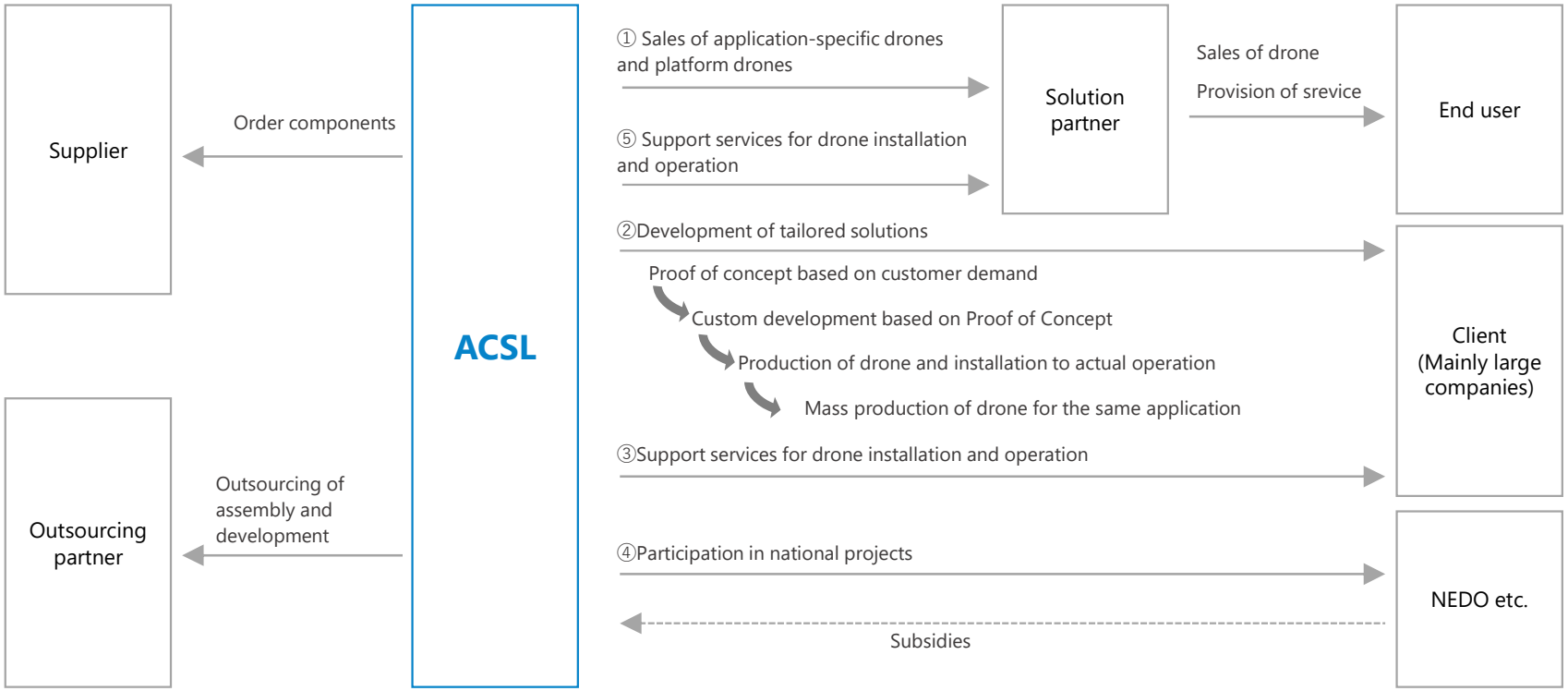
Custom development
(Design and development of system)

Sales of application-specific drones

Promote development, mass-production, and sales of application-specific drones

Business model of ACSL

The main source of revenue is the provision of services for demonstration and the sale of drone to client companies



1 Corporate overview, Core competency, Business model

2 Market overview

3 Medium-term management policy and business highlight

4 Current progress of business

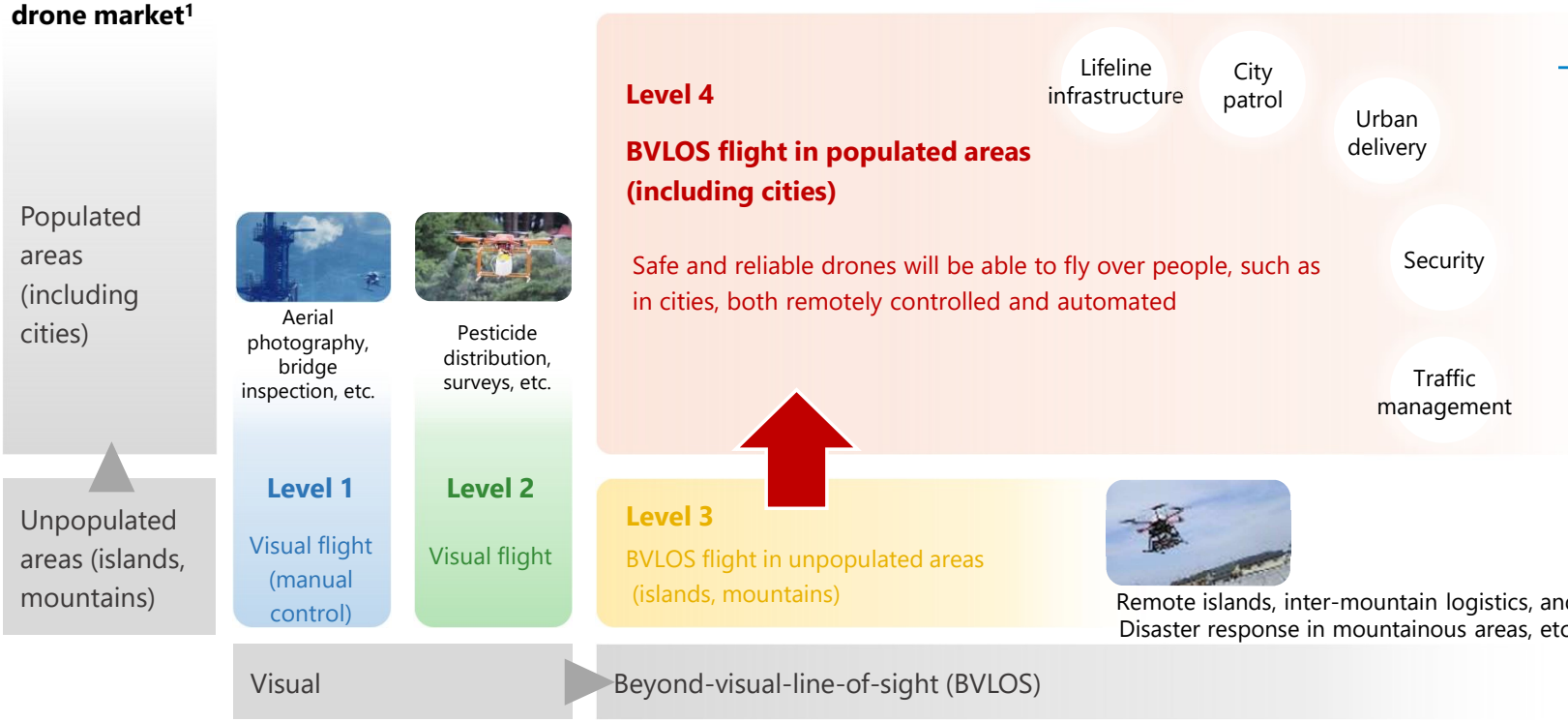
5 Risk information

6 Appendix

The industrial drone market is growing

In addition to Levels 1, 2, and 3, for which regulation have already set, regulations for level 4, beyond-visual-line-of-sight (BVLOS) flight in populated areas (including urban areas), are expected to be in place by FY2022, creating a huge market for drones in Japan

Classification of industrial drone market[1]



Potential of Level 3、Level 4 market (Example)

- **Delivery shifts to the sky**
  - Post Office 24,000 offices
  - Populated islands 416 islands
- **Labor saving in inspection**
  - Smokestacks 90k stacks in JPN
  - Water pipelines 470k km
- **Risk saving for dangerous tasks**
  - Large disasters 67 cases (2011-18)

1: Roadmap for Small UAV Utilization and Technological Development (April 28, 2016, Public-Private Sector Council for the Improvement of the Environment for Small UAVs)

Market Changes and ACSL's Initiatives through Q2

In Level 1 and 2, which are currently driving the market, social implementation of drones is progressing, while in Level 3 and Level 4, regulations and the development of application-specific drone are steadily progressing, and a huge space and market that can be used by drones is expected to emerge in the future

		Regulation	Technology & Products	Operation and implementation
Level 1 and 2 Visual Flight	Majority of the current market	▪ Relevant regulations are in place ▪ Application-specific guidelines will be developed in the future	▪ Mostly foreign-made general-purpose GPS-type machines ▪ Application-specific / non-GPS / secure drone required	▪ Prepared for general-purpose drones ▪ Specialized operations and solutions are important
Level 3 Beyond visual line of sight / Uninhabited areas	Current market is limited	▪ Related regulations are expected to continue to be revised	▪ Mostly application-specific drone ▪ Need to improve foundation performance and safety	▪ Mainly individual efforts of individual companies ▪ Systematized operations, training, etc. are required
Level 4 Beyond visual line of sight / Inhabited areas	A huge market to be created in the future	▪ Regulations expected to be in place by FY2022	▪ Development and commercialization of technologies in line with regulations is essential	▪ Need companies that can respond to regulations and build operations

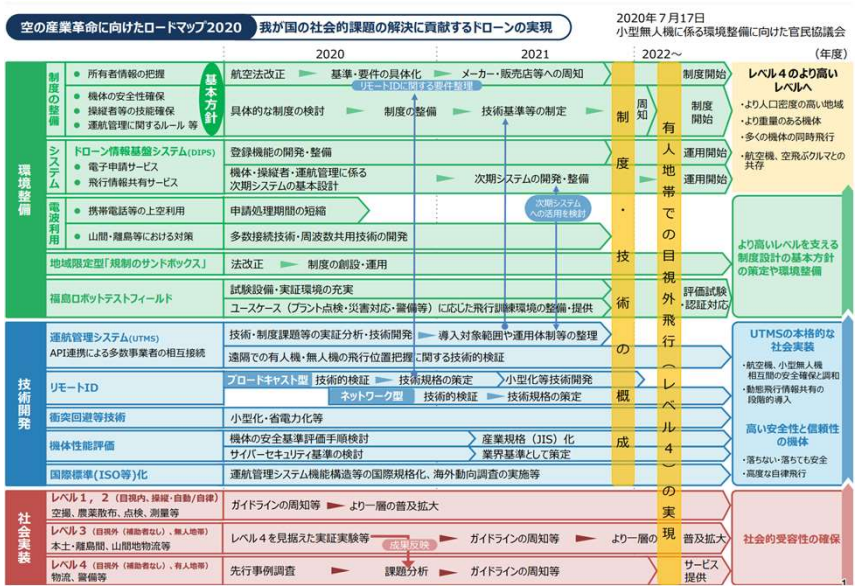
legislation for level 4 regulation is on track toward 2022

In May 2017, the Japanese government released its first "Roadmap for the Industrial Revolution in the Sky" and began working toward achieving Level 4 by 2022. In 2021, the Cabinet decided to revise the Civil Aeronautics Law in preparation for Level 4

Government action toward revision of Civil Aeronautics Law

May 2017	**Released "Roadmap for the Industrial Revolution in the Sky"** [1]
Sep. 2018	**Announced Level 3 regulation**[2]
Mar. 2020	**Announced the institutional overview to achieve Level 4** Announced overview to achieve Level 4, including aircraft certification, pilot license, remote ID, etc. [3]
Dec. 2020	**New institutional directions for achieving Level 4** To ensure safety flight in a more stringent manner to achieve Level 4 flight, government announced the direction of setting the certification for drone safety[4]
Mar. 2021	**Cabinet approves revision of Civil Aeronautics Law to realize Level 4** Cabinet approved certification system for drone safety (aircraft certification), pilot skill certification (pilot license), and mandatory reporting of accidents, etc. [5]

Roadmap for the Industrial Revolution in the Sky 2020



1: "Roadmap for the Industrial Revolution in the Sky," May 19, 2017, Public-Private Council for the Improvement of the Environment Related to Drone
2: "Examination Guidelines for Permits and Approvals for Unmanned Aircraft Flights," September 14, 2018, Civil Aviation Bureau, Ministry of Land, Infrastructure, Transport and Tourism.
3: "Institutional Design for Realization of Drone Flights Beyond Visual Line of Sight (Level 4) in Manned Zones," March 31, 2020, Public-Private Consultative Group for Improving the Environment Related to Drone
4: "Toward the realization of beyond-visual-line-of-sight flight in populated areas (including cities) (Level 4) in manned areas" December 10, 2020 Liaison Conference of Relevant Ministries and Agencies on Small Drone
5: "Cabinet Decision on a Bill to Amend the Civil Aeronautics Act, etc." March 9, 2021, Ministry of Land, Infrastructure, Transport and Tourism

Japanese government decides to introduce secure drones

Japanese government announced procurement policy for secure drones in September 2020. Global awareness for drones in context with national security and security is growing

Regulation to promote drone security

Government passed legislation to promote adoption of drones and 5G, while ensuring cyber security of them[1]

February 2020

Government policy of procuring “secure” drones

Government has announced that it will procure only “secure drones" and it will "promptly replace existing drones that are already in place" [3]

September 2020

June 2020

“Secure” drone development for government procurement

NEDO has allocated 1.61 billion JPY for development of a high-security, low-cost standard drone and a standard flight controller aiming for government procurement[2]

April 2021

Announced drone for government procurement

ACSL's NEDO project for a high-security, low-cost drone for government procurement announced to be launched from October 2021[4]

1: "Outline of the Draft Law on Promotion of Development, Supply and Introduction of Specified Advanced Information and Communications Technology Systems" February 19, 2020 Ministry of Economy, Trade and Industry
2: "Development of Basic Safety Drone Technology" June 25, 2020 New Energy and Industrial Technology Development Organization (NEDO)
3: "Policy on the Procurement of Unmanned Aircraft by Government Agencies, etc. " September 14, 2020 Liaison Conference of Relevant Government Agencies on Small Unmanned Aircraft
4: “ACSL, secure drone release, sale in October” April 14, 2021, The Nikkei.

Competitive environment of ACSL

In industrial drone market, specification of drone are required to be adapted to each application, and it is difficult to introduce a one-fits-all drone in actual operations. ACSL is developing application-specific drones for actual operations with a platform drones

Major market and major drone

☐ ACSL product

	Consumer（B to C）	Industrial（B to B）		
	Aerial	**Inspection**	**Logistics**	**Disaster Prevention**
General purpose Can be applied for multiple purpose	Mainly inexpensive foreign-made general-purpose drones	 **Platform PF2** Other companies: Mostly foreign-made general-purpose drones with GPS support	 **Platform PF2** Other companies: Mainly large logistics aircraft such as foreign-made VTOL aircraft	 **Platform PF2** Other companies: Mainly foreign-made general-purpose drone
Application-specific Optimized performance and specification for each application	No application-specific drone for consumer use	 **Small aerial**  **Smokestack**  **Enclosed environ.** Other companies: Limited number of drone for each inspection application	 **Delivery （Level 4)** Other companies: Very limited number of drone with Level 3 or higher safety performance	 **Small aerial** Other companies: Limited number of drone with flight performance and safety features for disaster prevention applications

1 Corporate overview, Core competency, Business model

2 Market overview

3 Medium-term management policy and business highlight

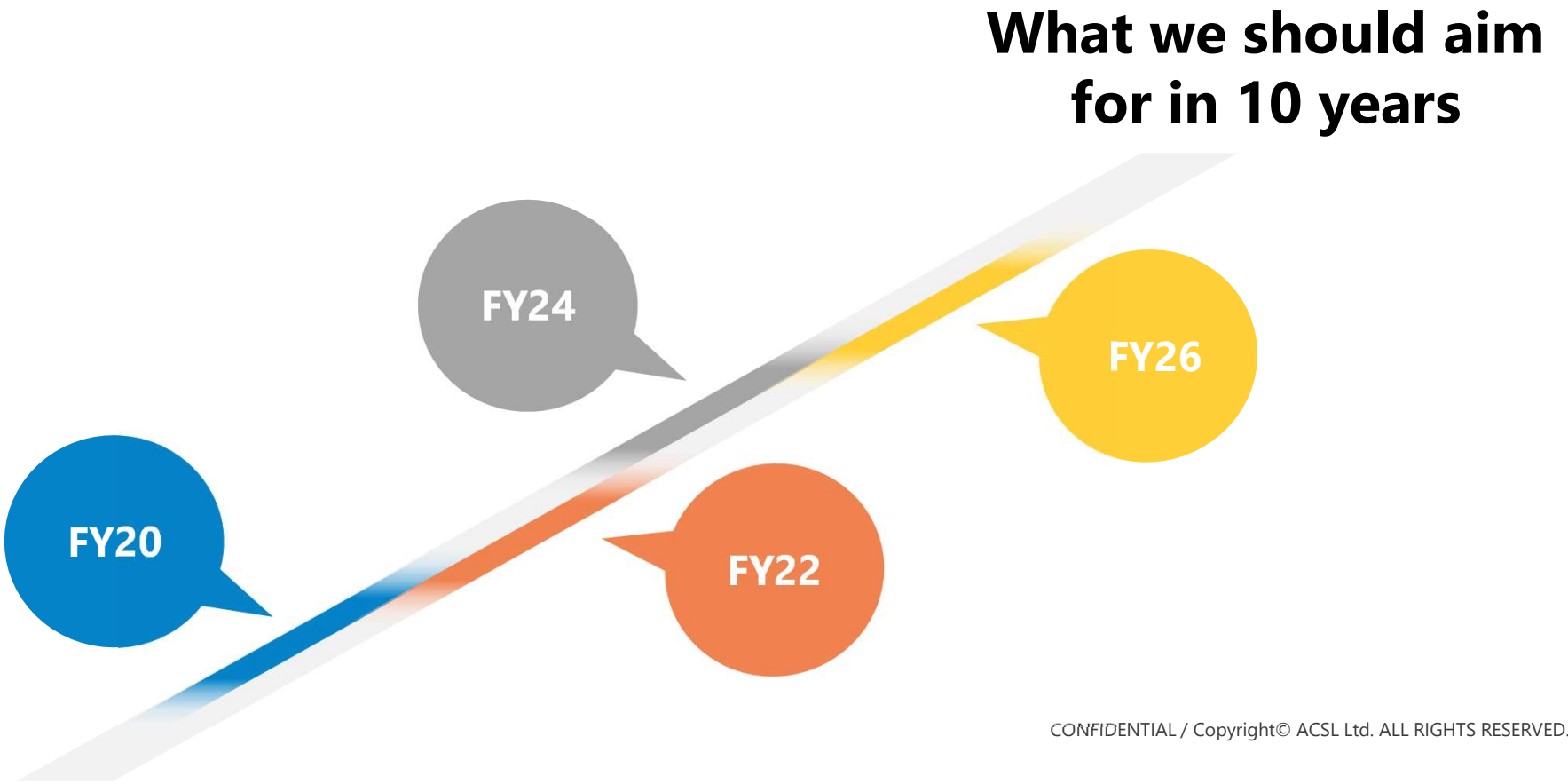
4 Current progress of business

5 Risk information

6 Appendix

Positioning of mid term policy “ACSL Accelerate”

In order to realize the "Master Plan," announced in August 2020 as ACSL vision for the next 10 years, ACSL has established "ACSL Accelerate," a rolling medium-term management policy that adapts to the changing business environment



Master plan, “To-Be” state in 10 years

1. Global pioneer in solving social infrastructure issues
2. More than 100 bn JPY sales, 10 bn JPY sales profit
3. Mass production manufacturer that produces 30,000 units/year
4. Supporting the country with de facto standards
5. Developing cutting-edge technologies for autonomous control (cerebellar and cerebral)
6. Nurturing the industry's most advanced and talented human resources
7. Constantly working to improve its corporate value and financial KPIs

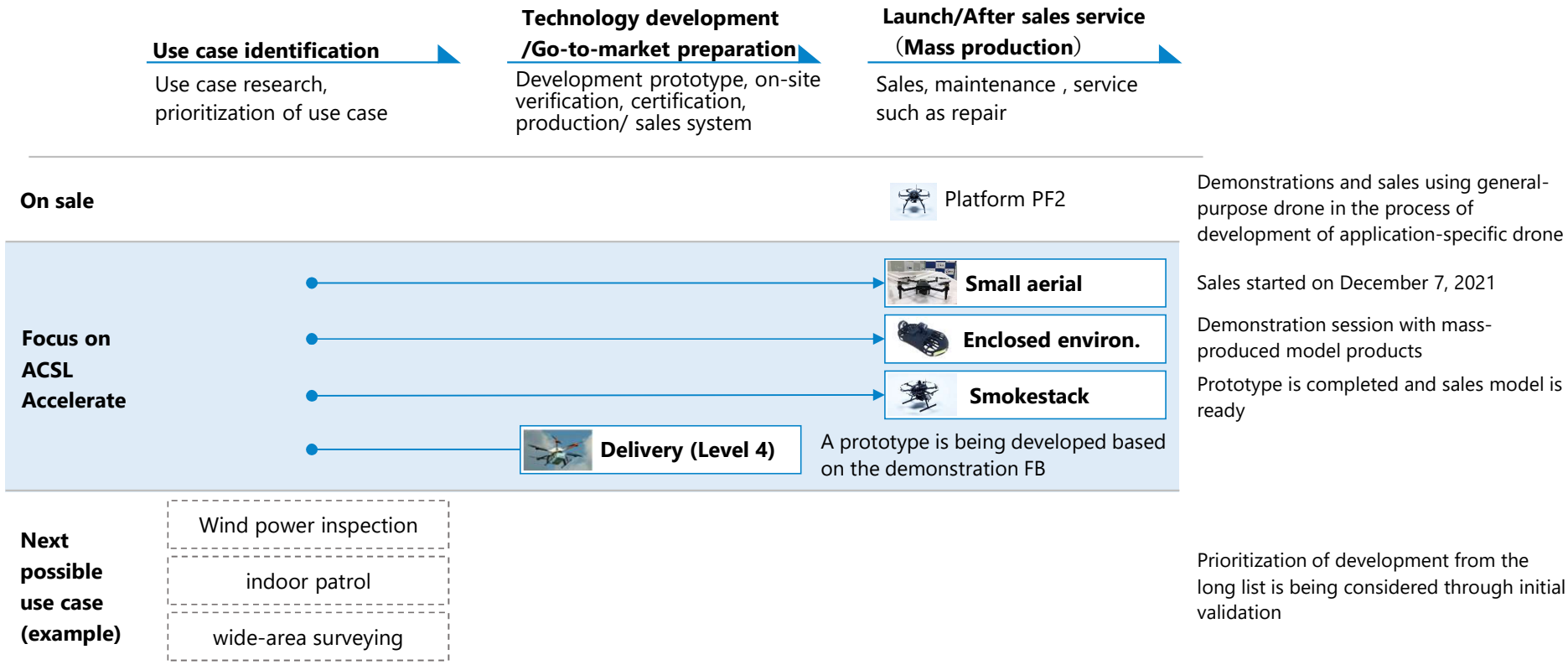
Medium-Term Management Policy and Current Progress

In response to the deregulation of Level 4 and the increasing demand for secure drones, the mid-term management policy has established four pillars of business strategy with the goal of "from a prototype factory to a mass production manufacturer.

	Strategies in Medi-term Management Policy	Progress
Development of application-specific drones	Commercialization of small aerial drones, medium delivery drones (Level 4 compliant), smokestack inspection drones, and enclosed environment inspection drones	**Commercialization of small aerial drone, closed environment inspection, and smokestack inspection has been completed,** and the aims to expand sales from 2022. Medium-sized logistics drone is underway through a series of demonstration tests.
Introduction of subscription model	Subscription-based fixed income/recurring sales model to be introduced to meet various customer needs, in addition to one-off drone sales	**Announced the launch of a subscription model in May 2021**. Lowering the initial adoption hurdle to reach a wide range of customers.
Full-scale expansion into ASEAN and other Asian countries	Establish an office in Singapore, the core city in the ASEAN region, and India and hire local talents to conduct development and sales activities, and begin full-scale overseas expansion	**Established a JV in India in September 2021 to capture the huge market in India.** Preparing to enter Singapore in parallel.
Technology procurement through CVC	Establish CVC and actively procure technologies with potential for technology synergies, such as AI, blockchain, security, image processing and sensors	Established CVC in December 2020, and **invested** in **several companies including overseas companies** as of September 2021

Application-specific drones： Steps toward launch

After identifying and prioritizing applications, ACSL is working with customers to develop application-specific drones for mass production.
Out of application-specific drones, small aerial droneis to be launched in December following the closed environment inspection drone



Small aerial drones ：Started orders for the secure small aerial photography drone "SOTEN"

The Japanese government has announced a policy to procure secured drones in September 2020, and ACSL has begun accepting orders for the SOTEN, a small, high-security aerial photography drone developed under a national project

1 **"Protecting technology" with secure domestic drones**

- Security measures based on ISO15408* to prevent data leakage and extraction, and to resist hijacking of the drone .
- Major parts are made in Japan or procured from highly reliable overseas suppliers.
- Encryption of communication and photographic data, and protection of acquired data in the domestic cloud

2 **“Cameras that can be switched with a single touch”**

- Adopting the one-touch switching method enables us to provide a wide range of camera options

3 **Flight performance required in a real-world environment.**

- With a maximum airspeed of 15 m/s, it is resistant to wind and can be used safely in severe environments such as during disasters.
- Equipped with SLAS/SBAS (sub-meter class positioning augmentation service of the Quasi-Zenith Satellite System MICHIBIKI) for highly accurate positioning information.

4 **A wide range of compatibility, including closed network LTE communications and offline maps**

- Even Internet is not available, the base station application on the control side can display an offline map and automatically fly the drone.

* International Standards for Computer Security

Enclosed environment inspection：Launch of the closed environment inspection drone “Fi4”

Launched the closed environment inspection drone “Fi4” that has been jointly developed with NJS and established a JV with NJS to provide services, including support. Lineup of drone is being incrased

Background and objectives

- **The total length of sewerage systems** in Japan is **approximately 480,000** km[1] , and the burden of inspection work due to aging is a serious issue
- **Jointly developed a closed environment inspection drone with NJS since 2015,** and improved its durability, maintainability, and usability for actual field use through demonstration tests
- **Establishment of a JV in May 2021** to provide services, including support

ACSL NJS

Joint investment

FINDi

Provision of inspection and other services using closed environment inspection drones

Launch of Fi4 closed environment inspection drone

- **Launch of the new Fi4,** a package that includes an airframe designed for harsh research environments and a dedicated operating application with improved usability
- Based on the images taken by the drone, **data analysis and functional diagnosis services to determine abnormalities such as deterioration status are** also provided at the same time
- In the future, the JV will **expand lineup of drone** to include pipeline facilities with flowing water, external inspections of facilities, and other application scenarios

1: Ministry of Land, Infrastructure, Transport and Tourism website

Smokestack inspection：Drone developed by KEPCO based on ACSL drone

Smokestack inspection drone developed by Kansai Electric Power Co. using the ACSL-PF2 as a base drone has been continuously demonstrated in real environments and Prototype is completed and sales model is ready

Background and objectives

- Issues such as the **safety risks of working at high elevations** and the need for **several weeks of work**
- **Provided ACSL-PF2** as the base drone for the development of **an autonomous drone to inspect the inside of a smokestack** at a thermal power plant of **KEPCO** in August 2020
- Kansai Electric Power, KANSO Technos and ACSL will collaborate to promote the inspection work inside the chimney

Overview of smokestack drone

- Controlled to **always be in the center of the chimney, enabling stable flight even in non-GPS environments**
- Equipped with high-intensity LEDs and a high-definition camera (60 megapixels), it can inspect interior walls and detect micro-cracks in dark environments

Top left: Smokestack inspection drone (ACSL-PF2)
Top right: LiDAR technology which realized drone to estimate its own location, even in dark, hard-to-recognize smokestacks
Bottom: Image of the movie taken from PF2. The upper center is the entrance to the top of the smokestack

Delivery：Progress in development of delivery drone for Level 4

Began development of a medium-sized delivery drone with optimized functions and performance through demonstration in actual fields. In addition, through a business and capital alliance with Japan Post, social implementation are being promoted

2020 November

Launched development of delivery drone for social implementation with VFR

Aiming to develop a drone optimized functionality and performance that can be used in drone logistics

2020 December

Successful demonstration of delivery drone with a 5kg payload

In cooperation with ANA HD and others, conducted a demonstration of a 5kg payload prototype drone in a real environment, and successfully flied a total of 65 times over a total distance of more than 160km in 4 days

2021 June

Concluded a capital and business alliance with Japan Post and Japan Post Capital

Concluded a capital and business alliance with Japan Post and Japan Post Capital through the practical application of drone delivery. Promoting the social implementation of drone utilization

Actual cargo being transported in a medium-sized delivery drone demonstration with a 5 kg payload

Press Conference on Capital and Business Alliance

Delivery : Japan Post to provide drones for delivery trials

ACSL provided drone to support Japan Post's delivery trial using a drone and delivery robot. In the field of mail and logistics, ACSL and Japan Post have a track record of demonstrating Level 3 flight (Non-visual flight)

Background and objectives

- Supporting Japan Post's **verification of a manpower-saving delivery model** in the mid-hill area of Okutama, Tokyo
- ACSL provided the drone "ACSL-PF2" and supported its operation. **Conducted a drone non-visual flight (Level 3) without deploying an assistant**
- The drone delivers mail to the delivery robot, which then delivers the mail to the recipient's home

Subscription model：Service starts in May 2021

In addition to one-off drone sales, launched a subscription service for inspection to lower initial cost for customers
Expect to attract potential customers by subscription services

Background and Objectives

- Introduction of drones is expected to reduce manpower and unmanned operations in infrastructure inspection
- However, **the introduction of high-quality industrial drones is a burden in terms of initial costs and maintenance cost and resource**
- Some customers gave up drone implementation due to hesitation to short-term costs
- **Launch subscription service, not one-off drone sales and aim to acquire potential customer base**

Advantages of subscription service

- **Significantly reduce the initial cost of installation of infrastructure inspection drone**
- Cameras and other equipment can be selected according to environment and application
- Contract periods are 3, 6, and 12 months

ACSL-PF2

Expansion into Asia: Establishment of a JV for expansion into India, selected as a Japan-India Economic and Industrial Cooperation Project

Established a local JV to capture the huge market in India, where Chinese drone is expected to replace. ACSL was selected as a Japan-India Economic and Industrial Cooperation Project to demonstrate Japanese drone technology

Trend in the Indian drone market

- **Cybersecurity risks in drones are also noted in India**. The move to **replace Chinese drones**, which account for a large share of the general-purpose drone market[1]
- The Indian government has significantly revised its policy on the introduction and use of drones, and **new drone regulations were issued in August**.
- With the revision of drone regulations, the Indian government is reportedly planning to **promote the drone industry more**

ACSL activities in India

- **Established ACSL India,** a JV in India with Aeroarc, a local drone company
- Selected by Japan External Trade Organization (JETRO) for "Subsidy for Promotion of New Business Creation in Asia DX **(Japan-India Economic and Industrial Cooperation Project)**
- **Began dialogue with the** Directorate General of Civil Aviation (DGCA), **the regulatory authority,** to comply with local regulations

1: The Nikkan Kogyo Shimbun

CVC：Investing in multiple domestic and overseas companies related to drones and related technologies

Established a corporate venture capital (CVC) in December 2020 with the aim of accelerating development by investing in companies with promising technological synergies and has invested in several companies in Japan and overseas

Business collaboration and CVC investment related to drone drone and peripheral technologies

	Control and Communication	Propulsion, on-board equipment and sensors	Analysis and operation support
In-house	**ACSL Core Technology** Proprietary "cerebrum" and "cerebellum" control and communication	Developing technologies for specific applications through collaboration with external partners	
Main investment	AutoModality Perceptive Navigation	unfunded	FINDi Closed environment Inspection ACSL INDIA India
CVC	**VFR Inc.** manufacturing and development collaboration	Actively reviewing potential investments	aerodyne WorldLink &Company AERONEXT

Purpose and overview of CVC

- Accelerated development **through technology synergies**
- Investment target are domestic and overseas **companies with unique technologies** that accelerate ACSL development through technical synergies (e.g., image processing, AI, blockchain, and security)
- As a basic policy, **minority investments in from seed to early phase**

Major investment history

- **Aerodyne: Asia's No. 1 drone service company[1].** collaboration for overseas expansion
- **Aeronext: With Seino HD, aim to create a drone logistics market** by verifying economic rationality and building a stable supply system
- **VFR:** Leveraging the **advanced design and manufacturing technologies** cultivated through VAIO's PC business, further strengthen collaboration through joint development

1: Frost & Sullivan "Asia-Pacific Best Practices Awards 2019" Asia-Pacific Unmanned Aerial Vehicle (UAV) Services Company of the Year

Major business highlights

In addition to the development of application-specific drones, strengthen demonstration and collaboration with existing and new customers to develop new applications, and promote collaboration with development, manufacturing, and sales partners

2020	Apr.	Small aerial drones Adopted in New Energy and Industrial Technology Development Organization (NEDO)'s project **"Development of Secure Drone Infrastructure Technology"**	NEDO
	May.	Enclosed environment Collaboration began with **VFR** for joint development of **application-specific commercial drone**	VFR Inc.
	Aug.	smokestack KEPCO developed autonomous flight drones that can **inspect the inside of smokestack at thermal power plants**. The ACSL-PF2 is provided as a base drone	関西電力 power with heart
		Delivery Selected for **Tokyo Metropolitan drone delivery project**	ANA docomo
		Delivery **4D GRAVITY® License Agreement with AERONEXT**	AERONEXT
	Oct.	Delivery AIRDs and JUAVAC **began offering specialized curriculum in drone delivery**	AIRDs
		Delivery Built a remote island model of telemedicine using drone logistics and other services in Goto City, Nagasaki, and **ACSL provided delivery drones and operational support**	ANA docomo avatarin NTT Communications 五島市 METRO WEATHER 長崎大学
	Nov.	Delivery **Started collaboration with Aerodyne** for continuous flight tests **in ASEAN**	aerodyne
2020	Nov.	Delivery **Started delivery drone development** for social implementation with VFR	VFR Inc.
	Dec.	Delivery **Successful site demonstration with a 5 kg payload drone** with ANA HD	ANA
2021	Mar.	smokestack **Development of "Non-GPS Compatible Autonomous Drone" for Inspection of Water Regulating Tanks** with Hokkaido Electric Power	ほくでん
	Apr.	Small aerial drones Introduction prototype drone developed in **"Development of Safe and Secure Drone Basic Technology"**	NEDO
	May.	Enclosed environment **Established FINDi as a JV** with NJS for the full-scale deployment of closed environment inspection drones	FINDi
	Jun.	Enclosed environment **Launched the new AirSlider® Fi4,** a drone for closed environment survey and inspection with **NJS**	NJS
		Delivery Toward social implementation of drone delivery at **Level 4,** formed a **capital and business alliance with Japan Post and Japan Post Capital Co**	日本郵便 日本郵政キャピタル
	Oct.	Enclosed environment **Hands-on experience operating** a **closed environment inspection drone**	
	Nov.	Small aerial drones "Secure Domestic Drones " **teaser site released**	
	Dec.	Small aerial drones Launched sales of secure small aeriall drone	

1 Corporate overview, Core competency, Business model

2 Market overview

3 Medium-term management policy and business highlight

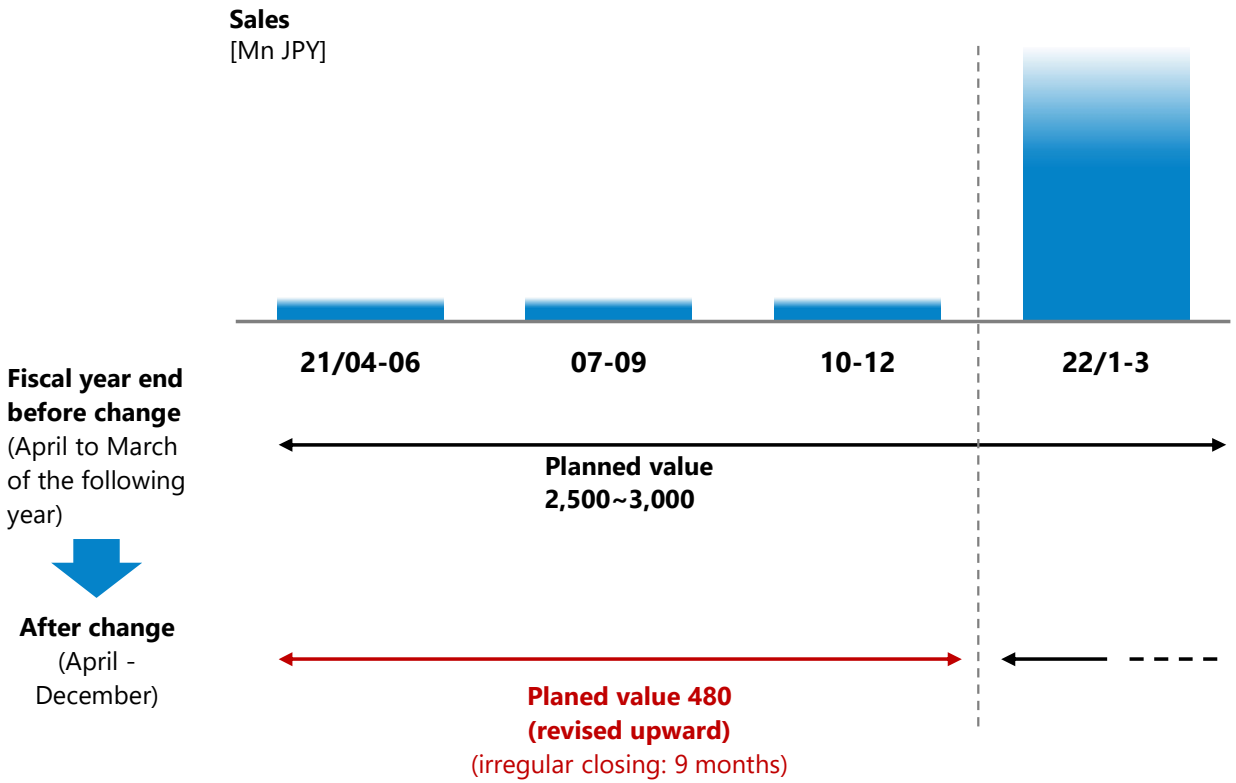
4 Current progress of business

5 Risk information

6 Appendix

Changes to fiscal year end

As sales were mainly realized in January to March, in order to address the transparency of full-year outlook the fiscal year has been changed to January to December from the April to March of the following year. With this change, the plan for the current fiscal year was also split



- ACSL records sales on an acceptance basis. Since most of the large projects are closed in March, sales are skewed to January and March quarter
- Due to a change in the fiscal year end, the fiscal year ending December 31, 2021 will be irregular, with only nine months from April to December 2021
- Sales of application-specific drone, such as small aerial drone, are expected to be booked from next year

Earnings forecast

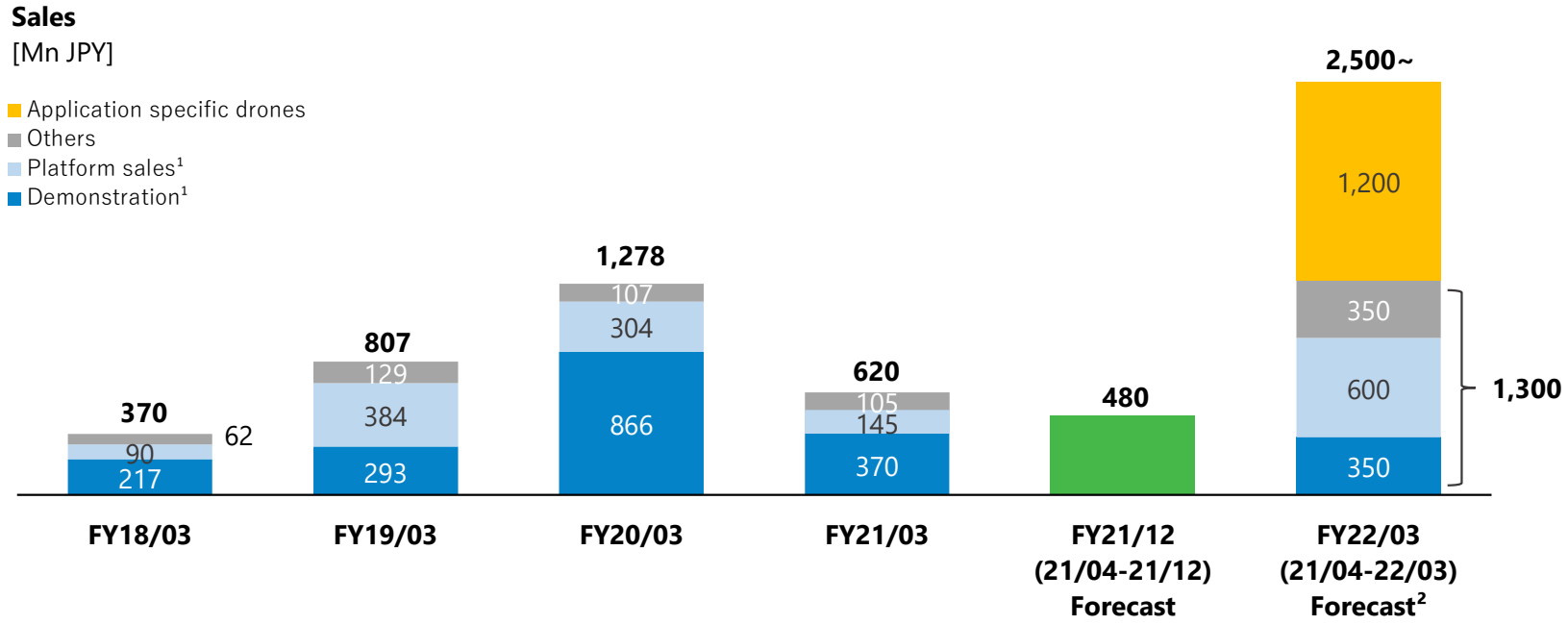
Made a resolution to change the fiscal year end from March to December at the general shareholders' meeting in June 2021.
Sales are expected to be 480 Mn JPY in 9 months. Operating loss is expected to be 1.02 billion yen due to upfron R&D expense

(Mn JPY)	FY21/12 (21/04-12) 9 Months Forecast	FY21/03 (20/04-21/03) 12 Months Actual	Reference[1] (22/01-03) 3 Months Forecast
Sales	480	620	2,150~2,650
Operating profit	▲980	▲1,139	-
Ordinary income	▲1,020	▲1,081	300~700
Net income	▲1,020	▲1,511	320~720

1: From earning forecast disclosed 2021 May

Sales Trends and Breakdown

FY22/03 (Apr. 2021-Mar. 2022) sales are expected to be 2.5~ Bn JPY consists of the same level of sales as FY20/03 plus increased sales for small aerial drone. FY21/12 (Apr. 2021-Dec. 2021) sales are expected to reach 480 million yen.



1: From the first quarter of the fiscal year ending March 31, 2021, solution construction (STEPs 1 and 2) will be renamed demonstration tests, and drone sales (STEPs 3 and 4) will be renamed platform drone sales
2: Consolidated earnings forecast announced in May 2021

KPI forecast

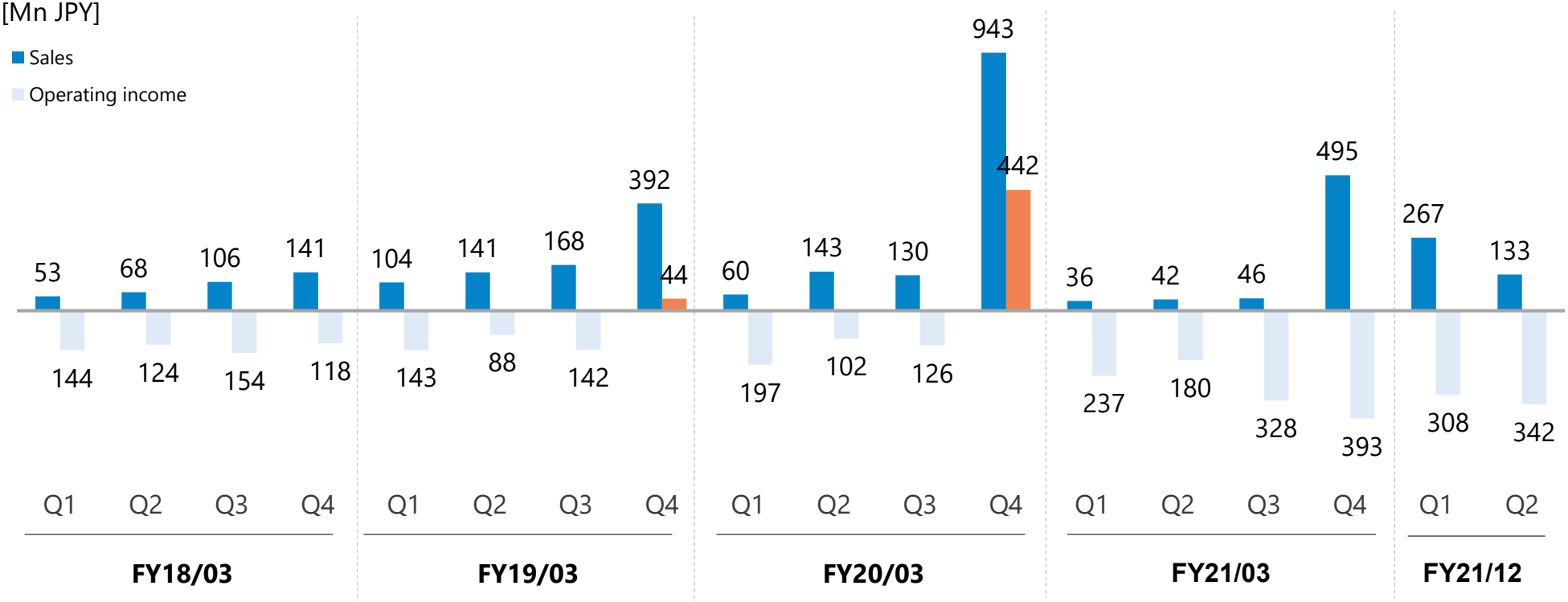
	Index	FY18/03 Actual	FY19/03 Actual	FY20/03 Actual	FY21/03 Actual	FY21/12 (21/04~ 21/12) Forecast	FY23/03 (22/04~ 23/03) Medium-Term Management Direction[2]
Sales of application-specific drones							
Small aerial photo （low ASP）	Unit	-	-	-	-	-	1,000~
	Value (100 Mn JPY)						10
Other application-specific drones （high ASP）	Unit						300~
	Value (100 Mn JPY)						10
Development of application-specific drones[1]							
PoC and Development	Project	60	81	112	82	39	-
	Value (100 Mn JPY)	2.1	2.9	8.6	3.7	1.2	20
Sales of Platform/ Evaluation drones[1]	Unit	40	106	101	46	16	-
	Value (100 Mn JPY)	0.9	3.8	3.0	1.4	0.5	10
Number of shipments[1]		-	136	128	71	23	~300

1: The number of Sales of Platform/Evaluation drones represents drone sold in the platform sales (former STEP 3 and 4), and the number of shipments represents the total number of drones shipped including the demonstration experiments (former STEP 1 and 2)
2: Medium-Term Management Direction "ACSL Accelerate FY20" announced in August 2020

Net sales and operating income by quarter

Every year, there is a seasonality for sales in Q1-Q3 (April-December) are small and large sales in Q4 (January to March).
FY21/12 Q1(21/04-06) sales were larger than previous years due to the booking some projects conducted in previous year.

Sales and operating income by quarter[1]



1: Figures for the third quarter of the fiscal year ending March 31, 2021 and thereafter are based on consolidated financial statements; figures for earlier quarters are based on non-consolidated financial statements.

Sales by quarter

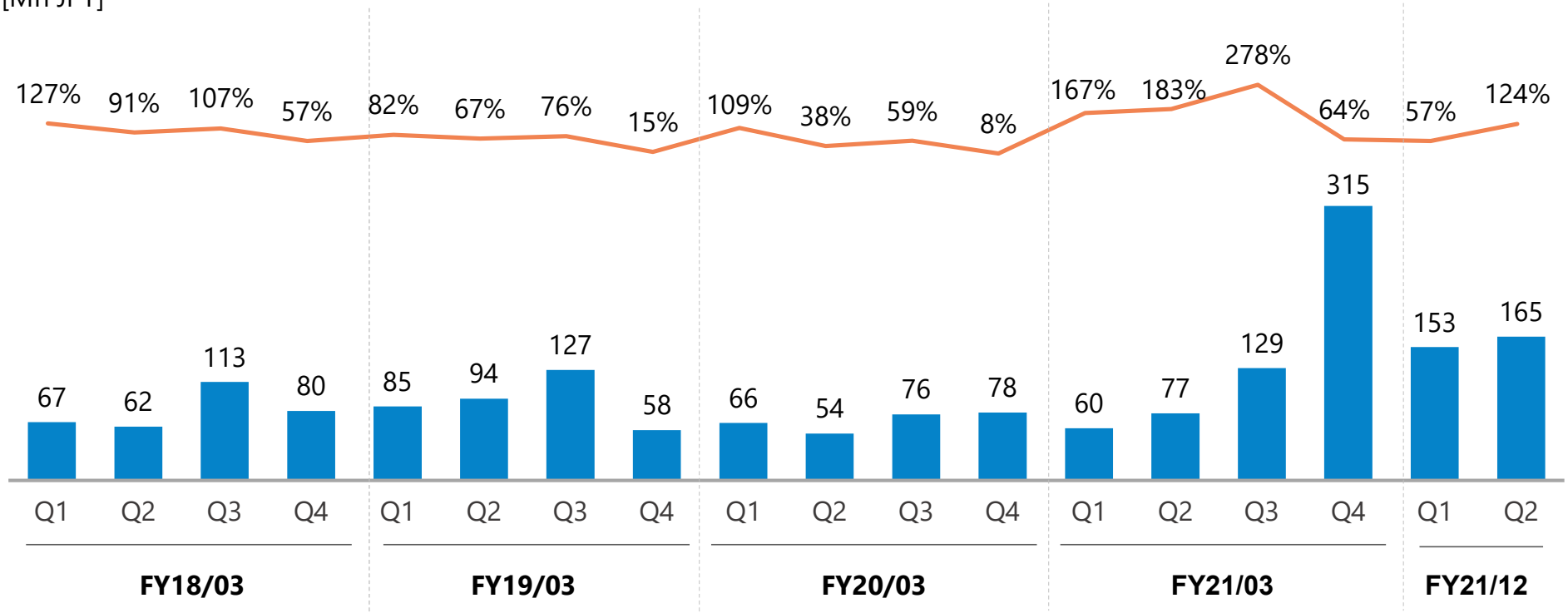
Fiscal Year		FY18/03				FY19/03				FY20/03				FY21/03				FY21/12	
Quarterly Results		1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q
Demonstration Experiment[1] • Proof of Concept • Custom Development	Sales Mn JPY	6	37	57	116	25	59	75	133	27	65	102	671	1	22	22	323	14	42
	Number of projects	8	6	27	19	6	16	22	37	14	22	21	55	2	11	15	54	6	14
Platform Selling the drone[2] • Sales of standard and general-purpose drone • Drone modified for customers based on the standard drone	Sales Mn JPY	16	25	32	16	10	67	80	225	24	48	19	212	4	10	13	116	15	34
	Number of units	7	10	18	5	8	20	31	47	6	12	9	74	1	3	5	37	6	6
Other[3] • Sales of parts • Fuselage repair service • Some national projects	Sales (of which, national pro) Mn JPY	30 (27)	6	16	9	68 (65)	14	12	33	9	29 (18)	9	59	30 (21)	8	10	55	237 (219)	55 (50)

1: Solution development (STEP1, 2) was renamed to "Demonstration Experiment" from FY21/03 Q1
2: Mass production (STEP3, 4) was renamed to "Platform Selling the drone" from FY21/03 Q1
3: For national projects, subsidies received are generally posted as non-operating income. On the other hand, some projects whose main purpose is to conduct commissioned experiments are recorded as sales

Trends in R&D Expenses

Regardless of the sales situation, ACSL continued core R&D activities as an upfront investment for market expansion.

R&D expenses by quarter and sales ratio
[Mn JPY]



Major financial items by quarter

Fiscal year[1]	FY18/03				FY19/03				FY20/03				FY21/03				FY21/12	
Quarterly Results	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q
Gross profit Mn JPY	4	40	63	68	13	83	101	204	8	69	75	655	▲ 6	▲ 6	▲ 13	94	17	5
Gross profit margin	9%	60%	60%	48%	13%	59%	60%	52%	14%	48%	58%	70%	▲19%	▲16%	▲28%	19%	7%	4%
SG&A Mn JPY	149	165	218	186	157	172	244	159	205	171	201	213	230	173	314	488	325	321
of which R&D expenses Mn JPY	67	62	113	80	85	94	127	58	66	54	76	78	60	77	129	315	153	165
R&D expense ratio to Sales	127%	91%	107%	57%	82%	67%	76%	15%	109%	38%	59%	8%	167%	183%	278%	64%	57%	124%

1: Figures for the third quarter of the fiscal year ending March 31, 2021 and thereafter are based on consolidated financial statements and figures for earlier quarters are based on non-consolidated financial statements

1 Corporate overview, Core competency, Business model

2 Market overview

3 Medium-term management policy and business highlight

4 Current progress of business

5 Risk information

6 Appendix

Key risks and management for them

Item	Key Risks	Risk Management	Possibility	Impact
Drone Safety	• In the event of a serious drone crash, not only at ACSL(the Company) but also at other companies, public trust in the safety of drones may be eroded, leading to a decline in demand from customers and a slowdown in market growth due to stricter regulations, which may affect the Company's business and earnings. In this case, our business and business performance may be affected. • In the unlikely event that a drone manufactured by our company crashes and causes damage to people, property, etc., there is a possibility that our business and business performance will be affected due to significant product liability compensation, large payments and expenses due to a recall, and loss of public trust.	• We are striving to realize drones that can coexist safely with people without causing accidents. In addition to promoting intrinsically safe design based on risk analysis, we are developing drones that can fly safely even in environments where GPS cannot be reached or in bad weather by utilizing some of our technologies.	Middle	High
Drone Safety	• In the event that security is compromised by malicious hackers, etc., the drone may become uncontrollable, causing damage to people and property, or data leaks may cause damage to users, etc., which may have an impact on our business and business performance due to large payments and expenses for serious product liability compensation and recalls, and loss of public trust.	• Our company places a high priority on safety in the selection of components related to data security, and we are working on the advancement of security technology on the drone side, such as communication encryption to prevent hijacking. In addition, we have selected solution partners and are able to identify all of our sales partners through direct transactions with our customers.	Low	High
Laws and regulations surrounding the drone business	• With regard to the Product Liability Law, since we manufacture products such as drones, if a victim proves that they have suffered life, body, or damage due to a defect in our products, etc., a claim for damages may be recognized.	• With regard to the Civil Aeronautics Law and the Radio Law, we have obtained permission and approval based on the said laws. • To mitigate risks, we have had our instruction manuals reviewed by an external technical writer and have worked with an insurance company to develop a dedicated insurance policy. We have also acquired ISO 9001 certification for quality management and airframe certification from the Japan Unmanned Aircraft Manufacturers Association (JUAV).	Low	High
Laws and regulations surrounding the drone business	• With respect to the Foreign Exchange and Foreign Trade Law, some of the products and parts sold by the Company may be subject to regulations. In the future, it is assumed that unexpected regulations may be enacted, revised or abolished, or that planned deregulation may not proceed as planned. In such cases, if the Company is unable to flexibly respond to the relevant laws and regulations, the Company's activities may be restricted due to the revocation of permits and licenses, which may affect the Company's business and earnings.	• When we export drones or provide related technologies to overseas markets, we comply with the Law and strive for appropriate export control.	Low	High

※ Among the contents of "Business and Other Risks" in the Annual Securities Report, major risks that may affect the execution of the business plan and the realization of growth are extracted and described. For other risks, please refer to "Business and Other Risks" in the Annual Securities Report.

Key risks and management for them

Item	Key Risks	Risk Management	Possibility	Impact
Intellectual Property Rights	• There is a possibility that intellectual property rights of which we are not aware have already been established, or that new intellectual property rights of third parties may be established, and it is extremely difficult to completely eliminate the risk of such infringement. • In the event that the Company is involved in a legal dispute with a third party in the future, the Company will consult with lawyers and patent attorneys and consider specific measures to be taken depending on the details of the dispute. However, the Company may incur a large human or financial burden to deal with the dispute, and in some cases may be subject to claims for payment of damages, etc. or injunctions against the manufacture and sale of products, etc., which may affect the Company's business and business performance.	• With regard to intellectual property rights such as patent rights related to our business, we have not received any indication of infringement of intellectual property rights from a third party, and we will continue to manage our intellectual property rights appropriately in order to prevent any infringement. • We will continue to invest in patent development as we expand our business.	Low	Middle
Procurement, pricing, and inventory of parts and materials	• The Company procures most of the parts and materials necessary for its production and R&D activities from external suppliers. However, in the event of interruptions in supply from suppliers or supply shortages due to a rapid increase in product demand, various activities may be restricted, which may have an impact on the Company's business and earnings. • In the event of quality problems, problems with the production system and quality control system at the supplier of the procured products, or other events that may have a significant impact on our business operations, our business performance may be affected. • There is a possibility of opportunity losses and lost profits due to inventory shortages, or additional expenses such as inventory management costs and impairment due to excess inventory, which may occur due to demand being different than initially expected.	• In the procurement process, we carefully conduct quality checks and other incoming inspections. • Inventory will be maintained at an optimal level in line with product plans and sales scale.	Middle	Middle

※ Among the contents of "Business and Other Risks" in the Annual Securities Report, major risks that may affect the execution of the business plan and the realization of growth are extracted and described. For other risks, please refer to "Business and Other Risks" in the Annual Securities Report.

Key risks and management for them

Item	Key Risks	Risk Management	Possibility	Impact
Product Quality	• In the unlikely event that a product defect occurs, depending on the nature of the defect, it could result in the incurrence of significant costs and loss of trust, which could have a negative impact on our business performance and financial position. Specifically, if the incidence of product defects within the warranty period exceeds our expectations, or if unforeseen defects occur, we may incur after-sales service costs, free repair costs, recall costs, and other expenses. • In the event that a victim proves that they have suffered damage to life or limb due to a defect in one of our products, etc., there is a possibility that a claim for damages will be approved based on the Product Liability Law. In the event that our response to these risks is prolonged and exceeds the scope of coverage by our insurance, our business activities may be hindered and our business performance and financial position may be affected.	• We have established quality assurance management rules and production management rules, and are striving to maintain and improve the quality of our products through manufacturing and quality control in accordance with these rules. • We will continue our efforts to improve the quality of our products, especially with regard to continuous improvement against defects, promotion of product designs that are less prone to defects, reinforcement of testing during development and prior to shipment, including the introduction of reliability testing, continued development of emergency countermeasure functions for our products, establishment of rules for operations such as flight and drone management, and strengthening of processes for handling customer complaints, malfunctions, and crashes.	Low	High
Uncertainty about business performance	• Sales volume may fall short of expectations due to a mismatch with customer needs, changes in epidemics, the emergence of competitors, economic fluctuations, restrictions on economic activities due to the spread of new coronavirus infections, etc. In addition, budget approval and execution timing on the part of customer companies may also affect our performance trends. • The Company was established in November 2013 and has been in business for only about eight years. Therefore, the operating results of the Company for the past fiscal years are not sufficient to make comparisons between periods, and the operating results for the past fiscal years alone may not be sufficient information to judge the future performance of the Company. • If we are unable to keep up with the rapid evolution of technology, or if we are unable to introduce new products or technologies that will win the support of our customers and the market, and if our R&D activities are not fully effective, we may incur expenses related to investments that exceed our expectations. In such cases, the Company may not be able to achieve the plan it is aiming for, or it may take time to return to profitability in operating income, etc., which may affect the Company's financial position and operating results. • As a result, there is a possibility that the numerical targets set forth in the medium-term management plan policy will not be achieved due to various factors, including the risks described in "Business and Other Risks.	• For continuous growth, we are engaged in research and development of hardware and software for drones as autonomous control robot systems. Based on the idea that it is necessary to continue research and development activities that are essential for the development of new products or technologies, we have been actively investing costs related to research and development expenses, and will continue to promote research and development activities in the future. • Our policy is to build a system that can generate sustainable profits and cash flow through sales growth. • Together with internal and external stakeholders, all parties involved will work as one to create customer value and enhance corporate value.	Middle	Middle

※ Among the contents of "Business and Other Risks" in the Annual Securities Report, major risks that may affect the execution of the business plan and the realization of growth are extracted and described. For other risks, please refer to "Business and Other Risks" in the Annual Securities Report.

Key risks and management for them

Item	Key Risks	Risk Management	Possibility	Impact
Risks related to fluctuations in business performance	• As the Company sells drone and provides proof-of-concept (PoC) services mainly to large corporations or projects related to public offices, sales tend to be concentrated in March, which is the end of the fiscal year for many customers. The reason for the high weighting of the accounting period from January 1 to March 31 is that the Company's sales are concentrated in this period. The reason for the higher weighting of the accounting period from January 1 to March 31 is that it is linked to the budget spending cycle of many of our clients, and the acceptance inspection of annual contracts is concentrated at the end of the accounting period for many of our clients. In addition, there are many cases in which we conclude large contracts, such as annual contracts, with government agencies, public institutions, and companies engaged in large-scale projects, in which case the acceptance inspection period falls at the end of the fiscal year, such as February and March. Therefore, due to such seasonal fluctuations, the Company's business results at a single point in time may not provide sufficient information for the analysis of full-year business results.	• The Company changed its fiscal year end (the last day of the fiscal year) to December 31 from the 10th fiscal year in order to improve the transparency of full-year business results, and therefore the accounting period will be from January 1 to December 31.	High	Low
Securing working capital	• Since our main business flow involves the purchase of parts, development, manufacturing, sales, acceptance inspection, and collection of funds, working capital tends to increase in conjunction with business expansion, and cash flow from operating activities may be negative. In addition, the Company participates in various projects through industry-academia-government collaboration to develop cutting-edge technologies, and receives subsidies and grants from the government. Receipt of such subsidies, etc., will be credited after the amount is fixed after the audit by the competent authorities is completed, but funds for conducting R&D activities will be required during the implementation period, and R&D expenses will be incurred upfront.	• We will strive to secure working capital by securing profits through improvement of our profit structure and efficiency of working capital, as well as borrowing from financial institutions when it becomes necessary to raise funds.	Middle	Low

※ Among the contents of "Business and Other Risks" in the Annual Securities Report, major risks that may affect the execution of the business plan and the realization of growth are extracted and described. For other risks, please refer to "Business and Other Risks" in the Annual Securities Report.

Key risks and management for them

Item	Key Risks	Risk Management	Possibility	Impact
Overseas Expansion	• In order to expand our business in overseas markets, we are collaborating with local companies to promote overseas development, mainly in Asia and the United States. In India, we have established a joint venture with a local company. However, in the event of unexpected social or political changes, changes in taxation systems or rates, or other changes in economic conditions in India, such events may have a negative impact on our business development. In addition, the Company's business development may also be adversely affected by changes in policies and laws and regulations in each country or economic zone, including import and export regulations and environmental protection regulations, in connection with the procurement of parts from foreign companies and the sale of the Company's products or technologies to foreign companies.	• It is our policy to work closely with local companies so that we can respond immediately to any changes in policies and regulations in each country or economic zone.	Low	Middle
Investment Activities	• As part of our growth strategy, we will actively consider corporate acquisitions, business alliances, and strategic investments, including those of overseas companies. In addition, the Company has established ACSL No. 1 Limited Liability Partnership as a corporate venture capital (CVC). In the event that the financial condition or business performance of the investee deteriorates due to changes in the business environment or preconditions, the Company's financial condition and business performance may be affected. In addition, for assets recorded in connection with investments, etc., if the expected cash flow cannot be generated due to deviations from future performance plans or changes in the market, an impairment loss may be recorded.	• The Company and CVC will make decisions on investments, etc., after giving due consideration to investment risks, etc., and will periodically check the possibility of recovering the investment value.	High	Low
Management system in a small-scale organization	• As of March 31, 2021, the Company operates as a small-scale organization with 6 directors (2 of whom are outside directors), 3 corporate auditors (1 of whom is a full-time corporate auditor), and 65 employees, and the internal management system is in line with the size of the organization. • In the event that we are unable to strengthen our workforce as planned, or in the event that unforeseen circumstances arise in the core personnel of our business that hinder the execution of operations, our business activities may be hindered and our business and business performance may be affected.	• In response to the future expansion and diversification of our business, we plan to increase the number of personnel and further enhance our internal management system.	Low	High

※ Among the contents of "Business and Other Risks" in the Annual Securities Report, major risks that may affect the execution of the business plan and the realization of growth are extracted and described. For other risks, please refer to "Business and Other Risks" in the Annual Securities Report.

Key risks and management for them

Item	Key Risks	Risk Management	Possibility	Impact
Impact of the spread of the new coronavirus infection	• However, delays in vaccination and the spread of mutated strains of the virus may cause prolonged stagnation of economic activities, which may lead to restrained new investments by our customers, a decline in our business activities, and an impact on our supply chain. In particular, from January to March is the months when sales are concentrated. In particular, if economic activities are curtailed due to restrictions on movement or the declaration of a state of emergency from January to March, when sales are concentrated, the financial position and operating results of the Group may be affected.	• We will continue to promote our business activities, including the use of remote work in our research and development. • By further promoting these efforts, we are working to ensure the safety and security of our employees and continue to provide services to our customers without delay.	Middle	Low

※ Among the contents of "Business and Other Risks" in the Annual Securities Report, major risks that may affect the execution of the business plan and the realization of growth are extracted and described. For other risks, please refer to "Business and Other Risks" in the Annual Securities Report.

1 Corporate overview, Core competency, Business model

2 Market overview

3 Medium-term management policy and business highlight

4 Current progress of business

5 Risk information

6 Appendix

Management Team (as of September 30, 2021)

President and COO **Satoshi Washiya**

M.S. of Architecture from Waseda University. Served both domestic and multinational companies in corporate wide transformation projects at Tokyo and Stockholm office of McKinsey & Company. Joined ACSL in July 2016.
.

Chairman **Dr. Hiroaki Ohta**

Ph.D. from Kyoto University. Assistant professor at Department of Aeronautics and Astronautics, Kyoto University, followed by research scientists at University of California, Santa Barbara. Also served as Technical Advisor for a start-up in Silicon Valley. McKinsey & Company from 2010. Joined ACSL as in July 2016.

CFO **Kensuke Hayakawa**

M.S. of Management of Technology from Tokyo institute of technology. Implemented operational improvement/transformation of Portfolio companies at KKR Capstone. Joined ACSL as CFO in March 2017.

CTO **Dr. Chris Raabe**

Ph.D. from University of Tokyo. Embedded software engineer at Boeing from 2006. Assistant professor at Department of Aeronautics and Astronautics, University of Tokyo from 2014. Joined ACSL as CTO in April 2017.

External Director **Masanori Sugiyama**

Audit & Supervisory member **Akira Ninomiya**

Audit & Supervisory member **Hideki Shimada**

Audit & Supervisory member **Takeshi Ohnogi**

Our Approach to the SDGs

We will actively promote SDGs by providing drone solutions in delivery and disaster prevention fields, where we are focusing our efforts to.

	Issues to be resolved	Our Approach	Specific examples	Corresponding SDG targets
Delivery	▪ Increase in logistics volume due to expansion of EC ▪ Difficulty in maintaining existing logistics due to declining labor force	Development of delivery drone Demonstration for drone logistics	 Conducted a demonstration on delivery between remote islands in Goto City, Nagasaki with ANA Holdings  Conducted a demonstration of drone delivery in the Nishi-Okutama, Tokyo, with Japan Post  Development of delivery drone with VFR	  
Disaster	▪ Need for rapid disaster response in the event of natural disasters ▪ Local governments are burdened with disaster response cost	Development of drones for support disaster areas Free offer of ACSL's drones to disaster areas	 Conduced a survey as initial action using a drone during a rain disaster in Nagano  Conducted a survey to check the situation using a drone during a rain disaster in Kyusyu  Transported emergency supplies in Nishitama-gun, Tokyo, with ANAHD and NTT DOCOMO	  

Disclaimer

Handling of this document

This document contains forward-looking statements about the Company, its plans and management objectives. These forward-looking statements are based on assumptions made at the time the statements were made regarding future events and trends, and are not guarantees of future results and involve risks and uncertainties. Actual results may differ materially from those in the forward-looking statements due to changes in the environment and other factors.
Factors that may affect the actual results described above include, but are not limited to, domestic and international economic situations and industry trends related to the Company.

The information contained in this document regarding other than the Company is quoted from publicly available information, etc., and the Company has not verified the accuracy or appropriateness of such information in any way.
Unless otherwise stated, the financial figures in this document are presented in accordance with accounting principles generally accepted in Japan.

The next disclosure of this material is scheduled to be made around the time of the announcement of annual financial results.

ACSL