YAMAHA FACT BOOK 2010

English Edition



The "Yamaha Fact Book 2010" has been produced to help you gain a better understanding of what Yamaha Motor is doing today. Although this publication is targeted at people working for the press and other mass media, we have taken other readers, both inside and outside the company, into consideration in preparing the booklet. We hope you will find it a useful guide to our diverse activities worldwide.

Notes: •Figures presented in the Yamaha Fact Book 2010 are either rounded off to the nearest whole number or to one decimal place. •Generally, the facts and figures presented in the Yamaha Fact Book

2010 are as of December 31, 2009.

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YAMAHA FACT BOOK 2010 Corporate Section

Consolidated Business Results for the Fiscal Year Ended December 31, 2009

Business Developments and Results

The world economy during the fiscal year ended December 31, 2009 (fiscal 2009) experienced a further downturn, characterized by sluggish consumption, reduced production and higher unemployment. These symptoms were repercussions of the credit crunch triggered by uncertainty over the global financial system.

In this environment, the Japanese economy also suffered a serious slump, with substantial declines in corporate earnings due to contractions in both production and exports, coupled with the yen's continuing strength against major currencies.

Reflecting these negative factors, the Yamaha Motor Group (the "Group") faced sharply declining demand in the leisure markets of Europe and the United States. In response, the Group adjusted product shipments and significantly reduced production for export from Japanese factories to developed nations, thus curtailing market stocks (distributors' stocks and Group inventories) during the period.

To attain sustainable growth amid these harsh business conditions, the Company focused on decreasing expenses, targeting a reduction of more than 10% of total consolidated expenses, while initiating the Urgent Cost Reduction Project to cut manufacturing costs. The Company also has been implementing structural reforms designed to build a profitable foundation, even amid rapidly shrinking business volume over the medium term.

In addition, the Company reduced capital expenditures by nearly half from the previous year. These efforts, combined with a considerable decrease in working capital through the curtailment of market stocks, produced positive free cash flows. The market in Asia (excluding Japan) was a relative bright spot, as demand for motorcycles fell only slightly there. The Company moved to expand sales in Asia by introducing new models and implementing aggressive promotions. This marketing approach enabled steady sales in Indonesia, Vietnam and other nations in the region.

The Company also focused on environmental technologies with future growth potential, launching new PAS electrically power assisted bicycles that comply with recently introduced standards in Japan, and enhancing the research and development system for next-generation mobility technologies, including electric motorcycles.

Nevertheless, in fiscal 2009, sales decreased 28.1% from fiscal 2008, to ¥1,153.6 billion, while operating loss and ordinary loss amounted to ¥62.6 billion and ¥68.3 billion, respectively.

During the fiscal year under review, the Company took measures to accelerate structural reform at businesses in developed nations. Specifically, the Company registered business structure improvement expenses as extraordinary losses, including impairment losses on fixed assets in Japan, Europe and the United States, and expenses incurred for early retirement of employees in Japan. However, these extraordinary losses, coupled with negative factors including the reversal of deferred tax assets, led to net loss totaling ¥216.1 billion.

Review by Business Segment

Motorcycles

In developed nations such as Japan, the United States and Europe, motorcycle sales for fiscal 2009 decreased from fiscal 2008, due to reduced demand amid the recession. In the ASEAN region, unit sales of the Vega-ZR, Mio and other Yamaha models increased in Indonesia, thanks to customer-oriented marketing, although total motorcycle demand declined in the region. In Vietnam, India and other nations in Asia (excluding Japan) where demand recovered early, aggressive new product releases spurred steady sales. However, the negative impact of the stronger yen caused a drop in motorcycle sales in Asia from fiscal 2008. Sales also declined in Latin America, particularly in Brazil, reflecting sluggish demand.

Consequently, total motorcycle sales for fiscal 2009 decreased 20.6%, from fiscal 2008, to \$817.1 billion, and operating loss amounted to \$4.2 billion.



Yamaha motorcycle user event in Indonesia



A Yamaha dealership in the United States

Marine Products

In the United States, sales of large outboard motors and personal watercraft fell from fiscal 2008. This was attributable to slow demand as consumption for recreational and leisure activities contracted amid the recession. Outboard motor sales also dropped in Europe and Russia.

These declines, coupled with the negative impact of the stronger yen and production cutbacks — designed to curtail market stocks — sent marine product sales for fiscal 2009 down by 37.1%, from fiscal 2008, to ¥150.1 billion, with an operating loss of ¥24.3 billion.



International boat show in Yokohama, Japan



4-stroke outboard motor, the F150A

Power Products

In the United States, sales of leisure-oriented sport all-terrain vehicles (ATVs) and side-by side vehicles decreased. This was primarily due to slow demand as consumption for recreational and leisure activities contracted amid the recession.

Decreased sales in the United States, the stronger yen, and production cutbacks designed to curtail market stocks, coupled with a provision for product liabilities, among other negative factors, reduced power product sales by 52.8%, from fiscal 2008, to ¥100.6 billion, with an operating loss of ¥33.8 billion.



YFZ450R ATV

Other Products

Demand for electrically power assisted bicycles increased in Japan, reflecting growing concerns for health and the environmental awareness. Thanks to the introduction of models that comply with new standards and the release of models designed to accommodate two small children, sales of electrically power assisted bicycles expanded steadily. However, sales of automobile engines and surface mounters decreased, due to declined demand amid the recession.

In total, sales of other products for fiscal 2009 dropped 30.2%, from fiscal 2008, to ¥85.9 billion, with an operating loss of ¥0.4 billion.



PAS Brace electrically power assisted bicycle

	Sa	lles	Salas as a paraantaga		Operating income
Business segment	Amount (millions of yen)	Annual change (%)	of net sales (%)	percentage of net sales (%)	Amount (millions of yen)
Motorcycles	817,058	-20.6	70.8	95.3	-4,151
Marine products	150,113	-37.1	13.0	84.2	-24,274
Power products	100,577	-52.8	8.7	91.2	-33,768
Other products	85,893	-30.2	7.5	30.3	-386
Total	1,153,642	-28.1	100.0	88.7	-62,580

Capital Expenditures

Capital expenditures for fiscal 2009 amounted to ¥46.0 billion, reflecting group-wide efforts to reduce



Marine engine manufacturing facility in Fukuroi City, Shizuoka Prefecture, Japan

investments in order to curtail depreciation expenses. However, certain investments in production equipment and facilities were made in Indonesia and other nations.



Production facility for cast wheels in Indonesia

Key Priorities the Group Must Address

During the fiscal year under review, the Company registered significant decreases in both sales and profits. These results were mainly attributable to a rapid downturn in the global economy, resulting in dramatic declines in demand in Europe and the United States, far worse than the Company's forecasts; product shipment adjustments designed to curtail market stocks; and significant production cutbacks at subsidiaries worldwide. Moreover, business conditions surrounding the Yamaha Motor Group (the "Group") are expected to become harsher than ever, reflecting the uncertainty of the global economic recovery.

In these extremely severe circumstances, the Group has been further accelerating the structural reforms launched last year by initiating a new medium-term management plan in 2010. The plan calls for swiftly building a profitable business structure with an eye toward realizing future growth. In the effort, the Group is focused on the following key priorities.

- For businesses in developed nations, the Company is further lowering the break-even target for production units, in line with a substantial estimate of future harsh demand. The Company is reducing fixed costs by reorganizing its global manufacturing layout and downsizing the workforce. Furthermore, the Company is cutting purchasing costs by expanding overseas procurement. With these efforts, the Group will concentrate on reforming profitability.
- 2. In the motorcycle business in emerging nations with great growth potential, the Company is

strengthening product competitiveness to better meet customer needs. In Asia (excluding Japan), where demand is expected to grow, it is offering value-added products at affordable prices. The Group is expanding parts procurement from local vendors to achieve further cost reduction, thus honing its competitive edge and expanding business in these markets.

3. The Company is also working to swiftly commercialize next-generation environmental technologies. In addition to developing environmentally friendly, fuel-efficient engines for motorcycles and outboard motors, and introducing electric powered motorcycles, the Company will aggressively promote electrically power assisted bicycles in line with anticipated demand growth overseas.

By addressing these issues, the Group aims to return to profitability on a consolidated operating income basis in fiscal 2010 and achieve a consolidated operating income margin of 5% in fiscal 2012.

The Group will return to basics as a manufacturer, once again intensifying its focus on product development and a bottom-up approach. Ultimately, Yamaha Motor seeks to evolve into an excellent engineering and manufacturing enterprise with a prominent presence in the global market. This, in turn, will surely raise the Group's corporate value. At the same time, the Group is committed to fulfilling its social responsibilities by implementing CSR (Corporate Social Responsibility) activities, including strict compliance with corporate ethics, as well as laws and regulations.

Corporate Facts

Founded:	July 1, 1955	
Capital:	¥48,342 million	
President:	Hiroyuki Yanagi	
No. of employees:	Non-consolidated basis: 10,690	Yamaha Mo Head Office
	Consolidated basis: 49,994	
Head office:	2500, Shingai, Iwata, Shizuoka 438-8501, Japan	
Lines of business:	Manufacture and marketing of motorcycles, scooters,	
	electrically power assisted bicycles, boats, sail boats,	
	personal watercraft, pools, utility boats, fishing boats,	
	outboard motors, diesel engines, all-terrain vehicles, side-	Llines a dei
	by-side vehicles, racing kart engines, golf cars, multi-	Presider
	purpose engines, generators, water pumps, snowmobiles,	
	snow throwers, automobile engines, intelligent machinery,	
	unmanned industrial helicopters, electrically power units	
	for wheelchairs, and helmets; biotechnological production	
	and processing of agricultural and marine products and	
	microorganisms and marketing of these products; import	
	and sale of various products; development of tourist	
	businesses and management of leisure, recreational facilities	
	and related services	
Yamaha Motor Group:	Number of consolidated subsidiaries: 107 (Japan: 29 overseas: 78)	
	Number of non-consolidated subsidiaries accounted for by the equity method: 7	
	Number of non-consolidated affiliates accounted for by the equity method: 26	



Yamaha Motor Co., Ltd. Head Office



Hiroyuki Yanagi President, Chief Executive Officer and Representative Director

As of December 31, 2009

Corporate Mission

Kando Creating Company

Yamaha, a company offering new excitement and a more fulfilling life for people all over the world

What Is Kando?

Kando is a Japanese word for the simultaneous feelings of deep satisfaction and intense excitement that we experience when we encounter something of exceptional value.

Management Principles

We strive to achieve our corporate mission by adhering to three principles:

1. Creating value that surpasses customer's expectations

We must remain keenly aware of customers' evolving needs, in order to provide them with quality products and services of exceptional value that surpass their expectations.

We can and will earn a fair profit by making all-out efforts to satisfy our customers.

2. Establishing a corporate environment that fosters self-esteem

Our corporate environment should be peopled with autonomous, empowered employees. In cultivating our employees' creativity and abilities, we will establish an equitable system of evaluation and rewards.

3. Fulfilling social responsibilities globally

As a good corporate citizen, we act from a worldwide perspective and in accordance with global standards. We will work locally to better the social environment, and think globally in helping preserve the natural environment.

Organization

(As of April 1, 2010)



Board of Directors, Corporate Auditors and Executive Officers

(As of April 1, 2010)

Board of Directors

President and Representative Director Hiroyuki Yanagi Representative Director Takaaki Kimura Director **Toyoo Ohtsubo** Director Yoshiteru Takahashi Director Masahito Suzuki Director Hiroyuki Suzuki Director Kozo Shinozaki Director (Outside) Shuji Ito Director (Outside) Masayoshi Furuhata Director (Outside) Eizo Kobayashi Director (Outside) Yuko Kawamoto

Corporate Auditors

Standing Corporate Auditor Haruhiko Wakuda

Standing Corporate Auditor Tsutomu Mabuchi

Corporate Auditor (Outside) Naomoto Ohta

Corporate Auditor (Outside) Norihiko Shimizu

Corporate Auditor (Outside) Tetsuo Kawawa

Executive Officers

President and Chief Executive Officer Hiroyuki Yanagi

Senior Managing Executive Officer Takaaki Kimura

Chief General Manager of Marine Business Operations, Executive General Manager of Water Vehicle Business Unit, Marine Business Operations, and Chief General Manager of Automotive Business Unit

Managing Executive Officer Toyoo Ohtsubo

Chief General Manager of Technology Center, and Chief General Manager of IM* Business Unit

Managing Executive Officer Yoshiteru Takahashi

Chief General Manager of Motorcycle Business Operations, Executive General Manager of Motorcycle Business Control, Motorcycle Business Operations, and Chief General Manager of Overseas Market Development Operation Business Unit Senior Executive Officer Masahito Suzuki Chief General Manager of Product Assurance Center, Chief General Manager of Business Development Managing Unit, and Chief General Manager of Smart Power Business Development Managing Unit

Senior Executive Officer Hiroyuki Suzuki Chief General Manager of Manufacturing Center, and Chief General Manager in charge of power product business

Senior Executive Officer Kozo Shinozaki Senior General Manager of Finance & Accounting Section

Senior Executive Officer Nobuya Hideshima Chief General Manager of Procurement Center

Senior Executive Officer Yoshiaki Hashimoto Senior General Manager of Human Resources & General Affairs Section

Senior Executive Officer Kunihiko Miwa Senior General Manager of Engineering Section, Motorcycle Business Operations, and Executive General Manager of Commuter Vehicle Business Control, Motorcycle Business Operations

Senior Executive Officer Masahiro Takizawa Senior General Manager of Corporate Planning Section, General Manager of Corporate Planning Division, Corporate Planning Section, and Chief General Manager of Parts Business Unit

Executive Officer

Toshimitsu Iio President of Yamaha Motor Manufacturing Corporation of America

Executive Officer

Masao Furusawa Senior General Manager of Technology Infrastructure Section, Technology Center, and General Manager in charge of MS* development for Engineering Section, Motorcycle Business Operations

Executive Officer

Nobuaki Shiraishi *Executive General Manager of Recreational Vehicle Business Control, Motorcycle*

Business Operations Executive Officer

Tadakazu Ishibashi

Executive General Manager of Business Development Managing Unit, and Senior General Manager of New Business Development Section, Business Development Managing Unit Executive Officer Souichi Sasagawa Executive General Manager of Boat Business Unit, Marine Business Operations

Executive Officer Hajime Yamaji President of Yamaha Motor Europe N.V.

Executive Officer Toshizumi Kato Senior General Manager of Sales Section, Motorcycle Business Operations

Executive Officer Hiroshi Yoshii Senior General Manager of Engine Manufacturing Section, Manufacturing Center

Executive Officer Takahiko Goan Executive General Manager of Overseas Market Development Operation Business Unit

Executive Officer Masato Adachi President of Yamaha Motor Corporation,

U.S.A.

Executive Officer Masanori Kobayashi

Executive General Manager of Smart Power Business Development Managing Unit, Senior General Manager of PAS* Business Development Section, Smart Power Business Development Managing Unit, and Executive General Manager of EV* Business Control, Motorcycle Business Operations

Executive Officer

Yoichiro Kojima Executive General Manager of Marine Engine Business Unit, Marine Business Operations

Executive Officer

Katsuaki Watanabe Senior General Manager of Body Manufacturing Section, Manufacturing Center

*Abbreviations:

IM: Intelligent Machinery MS: Motor Sports PAS: Electrically Power Assisted Bicycle EV: Electric Vehicle

New Medium-term Management Plan (January 2010 through December 2012)

The Company formulated its new medium-term management plan, encompassing management policies and goals, structural reforms, growth strategies, and the numerical targets the Company seeks to attain during the three-year period from 2010 through 2012.

The new plan envisions the Yamaha Motor Group as an excellent engineering and manufacturing enterprise with a prominent presence in the global market. It calls for the Company to get back to basics, redoubling its commitment to product development and a bottom-up approach. During the new medium term, the Company will make all-out efforts to implement structural reforms, build a foundation to enable profitability, and lay the groundwork for future growth.

Management Policies and Goals

The plan is designed to attain its objectives in two phases. Phase I (through 2010) puts an emphasis on accelerating the Company's structural reforms, reducing the break-even-point production volume, and working to build a profitable structure. In Phase II (2011 through 2012), the Company will lay the groundwork for future growth and take action toward realizing it. In its roadmap toward these objectives, the Company has established three management policies, centered on promoting businesses in developed and emerging nations, and laying the groundwork for future growth. The Company also identified goals for its mainstay businesses, including reforming the profitability structure. This means creating a management foundation that enables the Company to earn profits from motorcycle, outboard motor, and ATV/SSV businesses in developed nations regardless of the size of the nations' markets. In addition, the Company is seeking to aggressively expand the motorcycle business in emerging nations that show growth potential, on both a qualitative and quantitative basis.

Three management policies

- 1. Reforming the profitability structure of businesses in developed nations (Phase I)
- 2. Quantitative and qualitative expansion of the motorcycle businesses in emerging nations (Phase I)
- 3. Laying the groundwork for future growth (Phase II)



New medium-term management plan: Two management phases

Goals for mainstay businesses

Motorcycle business in developed nations: Reforming the structure to enable profitability and accommodate the market recovery

Motorcycle business in emerging nations: Simultaneously increasing the appeal and profitability of products in ASEAN markets Enhancing Yamaha's market presence in China and India

Outboard motor business:

Attaining far and away the top share in the global market

ATV/SSV business:

Restructuring the business foundation

Structural Reforms

In formulating the management plan discussed above, the Company assumed that demand in developed nations will fall below the levels it officially announced on August 4, 2009 in its consolidated financial results for the first six months of the fiscal year ended December 31, 2009.

Based on these assumptions, the Company has lowered the annual production volume required to reach the break-even point for some mainstay products. For outboard motors, the break-even point remains at 230,000 units, unchanged from the August announcement. However, for motorcycles, the number has been reduced from 250,000 to 200,000, while for ATVs and SSVs, it has been lowered from 140,000 to 100,000. At the same time, the Company is expanding the scope of three structural reforms — reorganizing the manufacturing layout, streamlining the workforce, and reducing costs — beyond the level envisioned in the previous announcement. The moves are designed to significantly reduce fixed costs and improve profitability.

Key points of profitability structural reforms in developed nations



Growth Strategy

The new plan lays the groundwork for future performance by concentrating on growth in emerging nations and the ASEAN region, and accelerating the development of environmentally friendly engines and electric drive technology. Once the stage is set, the Company is working steadily to realize growth moving forward.

The Company's growth strategy builds on the *Frontier* 2020 long-term vision, announced in 2008. Of the highpriority domains in *Frontier* 2020 — the Yamaha brand, personal mobility, engines, and new technologies — the strategy puts the strongest emphasis and concentrates resources on personal mobility and engines.

- 1. Affordably-priced motorcycles for emerging nations
 - •Releasing affordably-priced motorcycles in India and China
 - •Reducing manufacturing costs of models for emerging nations

- 2. Motorcycles for the ASEAN region
 - •Simultaneously increasing the appeal and profitability of products featuring the fuelinjection (FI) system
 - Enhancing the product appeal by increasing the ratio of models featuring the FI system
 - Raising profitability by reducing FI system cost and expanding the business
- 3. Next-generation environmentally friendly engines
 Motorcycles: Making Yamaha commuter vehicles more competitive in ASEAN markets
 - •Outboard motors: Building the superiority of next-generation 4-stroke models
- 4. Smart Power
 - Accelerating the development of electric powered motorcycle technologies, and the marketing of products featuring the technologies
 - •Strengthening Yamaha Motor's product presence in the growing electrically power assisted bicycle market, appealing as a market pioneer



Growth strategy: Four high-priority domains

Numerical targets

■ Numerical targets for consolidated financial results The new plan envisions a return to profitability on a consolidated basis in fiscal 2010 and a consolidated operating income margin of 5% in its final year, fiscal 2012. To attain these objectives, the Company intends to reform the profitability structure so that it is not dependent on market size in developed nations, while achieving quantitative and qualitative expansion of the motorcycle business in emerging nations.

The Company has specified the numerical targets highlighted in the table below for the plan's consolidated financial results. The targets are premised on exchange rates of ¥88 against the U.S. dollar and ¥128 against the euro during the three-year period.

	FY2009 results	FY2010 forecasts	FY2012 targets
Consolidated net sales	¥1,153.6 billion	¥1,250 billion	¥1,400 billion
Consolidated operating income (loss)	¥(62.6) billion	¥10 billion	¥70 billion
Operating income margin	_	0.8%	5%

■ Capital expenditures, cash flows, interest-bearing debt The Company plans to use ¥120 billion as capital expenditures during the period, primarily in support of new motorcycle releases in emerging nations and the ASEAN region, cost reduction programs, and environmentally friendly engine and electric-drive technology development. The investments are targeted toward achieving future growth.

The Company also aims to generate free cash flows of ¥150 billion, while reducing ¥150 billion in interestbearing debt in the new three-year period.

Capital expenditures	¥120 billion (cumulative over three years)
Free cash flows	¥150 billion generated (cumulative over three years)
Interest-bearing debt	¥150 billion reduction (cumulative over three years)

Operating Performance (Consolidated Basis)

	(Ur	nit: billion ¥ except ex	change rate; rounded o	off to one decimal place)
	FY2007	FY2008	FY2009	Note 1 FY2010 (Plan)
Net sales	1,756.7	1,603.9	1,153.6	1,250.0
Net income	71.2	1.9	(216.1)	0.0
Operating income	127.0	48.4	(62.6)	10.0
Ordinary income	140.3	58.9	(68.3)	10.0
Capital expenditures	84.8	94.4	46.0	39.0
Depreciation expenses	54.6	59.6	53.7	42.9
Research and development expenses	85.6	85.1	62.1	60.0
Equity ratio	42.1%	33.9%	21.5%	22.1%
ROE ^{Note 2}	13.4%	0.5%	(101.7%)	0.0%
Interest-bearing debt	229.8	349.2	399.9	330.0
Exchange rate (¥: US\$/euro)	117/156	103/153	94/130	88/128
Percentage of overseas sales	89.7%	89.4%	88.7%	89.2%
Percentage of motorcycle business sales	60.1%	64.1%	70.8%	70.4%
Number of consolidated subsidiaries	111	113	107	—
Net cash provided by (used in) operating activities	122.7	(6.4)	74.1	—
Net cash used in investing activities	(105.8)	(99.5)	(45.3)	—
Net cash provided by (used in) financing activities	11.2	163.2	(32.0)	_
Cash and cash equivalents at the end of the year	102.1	134.4	137.2	_

Notes 1Fiscal years ending December 31 of the year indicated.2ROE (Return On Equity): Net income per share/Net assets per share × 100

Sales Breakdown by Business (Consolidated Basis)



Major products in the motorcycles segment include: motorcycles and knockdown parts for overseas production; in the marine products segment: outboard motors, personal watercraft, pleasure-use boats, fiberglass-reinforced plastic pools, fishing boats, utility boats and diesel engines; in the power products segment: all-terrain vehicles, side-by-side vehicles, snowmobiles, golf cars, generators, snow throwers and multipurpose engines; and in the "other products" segment: surface mounters, industrial robots, automobile engines, automobile components, electrically power assisted bicycles, unmanned industrial helicopters, electrically powered wheelchairs and the intermediate parts for products in all business segments.

Sales Breakdown by Region (Consolidated Basis)





Change in Number of Employees

At the end of fiscal year		2003/3	2004/3	2004/12	2005/12	2006/12	2007/12	2008/12	2009/12
Number of employees	Yamaha Motor (average age)	8,168 (40.2 years old)	8,078 (40.5 years old)	8,099 (40.7 years old)	8,136 (40.9 years old)	8,461 (40.9 years old)	9,019 (41.0 years old)	9,396 (38.9 years old)	10,690 (40.7 years old)
	Consolidated companies	23,898	25,616	28,569	31,245	33,497	37,831	40,365	39,304
	Total	32,066	33,694	36,668	39,381	41,958	46,850	49,761	49,994

Change in Number of Recruited Graduates (Yamaha Motor Co., Ltd.)

Fiscal year		2004/3	2004/12	2005/12	2006/12	2007/12	2008/12	2009/12	2010/12	2011/12 (Plan)
Graduates of four-year colleges and graduate schools		111	132	112	128	148	172	249	64	Some
	(Office work, marketing)	(36)	(35)	(22)	(32)	(39)	(36)	(43)	(14)	0
	(Engineering, production-related work)	(75)	(97)	(90)	(96)	(108)	(136)	(206)	(50)	(Some)
	Two-year/technical college graduates	19	13	8	22	31	20	26	7	0
	High school graduates	54	21	30	86	100	95	113	0	0
	Total	184	166	150	236	279	287	388	71	Some

Note: The fiscal period ended December 31, 2004 was an irregular nine-month accounting period, due to a change in the Company's annual closing date, from March 31 to December 31.

YAMAHA FACT BOOK 2010 Product Business Section

Motorcycles

Product Profile

Motorcycles are convenient personal commuter vehicles for daily use. They also serve in utility applications, including the transportation of goods, and are popular worldwide for such leisure uses as touring and racing.

Reference

In Japan, a driver's license is required to ride a motorcycle on a public road. There are four types of driver's license for motorcycles, classified by engine displacement: 50cc and under: Motor-driven cycle Up to 125cc: Standard motorcycle with small-size engine Up to 400cc: Standard motorcycle Unlimited displacement: Large motorcycle

In addition, a new license limited to the operation of automatic transmission (AT) motorcycles has been introduced.

(License for AT motorcycles only)

Up to 125 cc:	Small AT motorcycle
Up to 400 cc:	Standard AT motorcycle
Up to 650 cc:	Large AT motorcycle

Applications (User Profile)

Motorcycles are popular in utility applications, mainly for newspaper and other door-to-door delivery purposes, where distinguishing features such as agility, space-saving design and energy-saving performance make the motorcycle a desirable solution. Meanwhile for leisure, motorcycles are in widespread use for on-road touring and racing, as well as for off-road riding. In recent years, scooters of various engine sizes have also been gaining popularity worldwide as commuter vehicles.

Background of the Business

During Japan's post-World War II recovery, Nippon Gakki Co., Ltd. (presently Yamaha Corporation) was looking to make productive use of its manufacturing machinery when Genichi Kawakami, Nippon Gakki's fourth President, decided to enter the motorcycle business. He based the move on his rich experience traveling and observing overseas markets, a review of engineers' reports on inspection tours in Europe, and results of extensive market surveys. Before settling on motorcycles, he considered and compared a number of other candidate products, including sewing machines and motorized tricycles.

Yamaha's first motorcycle model, born after numerous prototypes, was the YA-1, featuring a 2-stroke 125cc engine. To mass-produce and market the YA-1, Yamaha Motor Co., Ltd. was established on July 1, 1955. (First President: Genichi Kawakami) Nicknamed the "Red Dragonfly," the YA-1 became wildly popular.

In its first entries on the racing scene, the YA-1 made a dramatically successful debut, winning the championship in the Mt. Fuji Ascent Race and the Asama Highlands All-Japan Endurance Motorcycle Race, two of the major motorcycle races in Japan at that time. In the 1960s, Yamaha motorcycles competed in the World Championship Road Racing series. Through its outstanding performance in motorcycle racing, the Company gained the expertise to develop and manufacture a highly acclaimed line of motorcycles to a global standard. The Company has since expanded its product lineup from on-road bikes to off-road models and scooters, thus gaining a wider fan base for Yamaha motorcycles.



Current Business Conditions — Product Features and Technologies

Major Markets

Japan

In Japan, motorcycle demand plunged in the 1980s after the motorcycle helmet law was enacted and the so-called "Three No Campaign*" against motorcycling for young people gained momentum. Thereafter, the falling birth rate, a steep and continued fall in the youth population, diversifying consumer preferences, the sluggish economy and motorcycle parking problems have all converged to cause a significant decrease in motorcycle demand. Recently, annual demand in the Japanese motorcycle market has fallen to about 1/7 its peak level (3,280,000 units in 1982).

Half of the demand in today's domestic market is for scooters in the Class-1 category (engine displacement of 50cc and under), used in an array of applications from business to daily commuter transportation. However a growing number of people — especially middle-aged riders — now enjoy touring on bigger bikes.

Yamaha is on top of these market trends with its versatile Axis Treet 125cc scooter and the stylish 1,680cc VMAX and 1,000cc YZF-R1 sportsbikes. These models are attracting attention with their appeal to mature leisure and hobby riders.

Note: *The "Three No" Campaign

In an effort to prevent motorcycle accidents and deter reckless motorcycle riding among high school youth, in the 1970s some high schools began promoting a "Three No" campaign with the slogans, "No motorcycle license," "No motorcycle riding," and "No motorcycle buying." The All-Japan High School PTA* Federation supported the movement and spread it nationwide. However, to many people, the "no, no, no" message embodied an overly regimented education system. Backlash against the approach, combined with the government's introduction of a new traffic safety education curriculum, slowed the campaign in the late 1990s.

*PTA is the abbreviation for Parent-Teacher Association

Europe and U.S.A.

In the United States, many people enjoy cruising open stretches of road across vast expanses of land on long, low-riding cruiser bikes. Off-road racing is another popular American pastime. The dynamic purchasing power of baby boomers and Generation Y "Echo Boomers" had been expanding motorcycle demand in the U.S. before the worldwide recession sent this demand falling.

Europe, the birthplace of motorcycles, has a solid, well-developed motorcycle culture. Here, all types of motorcycles, from small-engine scooters to large sportsbikes, enjoy great popularity.

With deregulation of licensing systems in Europe following the integration of the EU, starting in 1996, drivers with automobile licenses could legally ride motorcycles with engines smaller than 125cc. (Before the revision of the law, the limit was 50cc.) This deregulation set off a scooter boom, stimulating an expansion in demand. However, total motorcycle demand in Europe plunged amid the worldwide recession, mirroring the United States.

Despite the difficult business environment, Yamaha's large sportsbikes remain very popular in Europe and the United States. Several models have been particularly successful in these markets recently, including the completely redesigned VMAX, released in 2008 after 24 years without major changes, the YZF-R series incorporating G.E.N.I.C.H. electronic control technology, and Yamaha's exclusive cruiser line, the Star series.

ASEAN region

In the ASEAN region, the last two decades of the 20th century were marked by the rise of motorization, particularly for nations such as Indonesia, Thailand and Vietnam. This, coupled with the establishment of local joint-venture companies by Japanese manufacturers, spurred the demand growth in the region. In 1997, the currency crisis erupted in the region, temporarily pushing demand down. However, the region's economies recovered, and total demand now remains on a steadily expanding track.

The mainstay motorcycles in the ASEAN region are 4-stroke models with engine displacement of about 110cc, popular for their agility and availability at affordable prices. In addition to traditional bestselling moped models, automatic transmission continuously variable transmission (CVT) — models have been catching on in recent years.

Yamaha Motor developed the Y.C.A.T., a compact CVT unit for mopeds, in 2009, designed for the markets of this region. The Y.C.A.T. realizes a stepless transmission ratio variation, while maintaining the versatility and riding performance of mopeds. The 2010 LEXAM, introduced in Vietnam was the first model to feature the Y.C.A.T. This new transmission system will be incorporated in other moped models scheduled for release in the region.

Fuel efficiency is a key purchase driver for motorcycle consumers in ASEAN nations. Yamaha Motor developed the YM-JET-FI^{Note} a fuel injection (FI) system featuring proprietary technology for improved fuel efficiency. The Company plans to mount this new FI system in its line of 100cc to 125cc scooters in the region.

Yamaha Motor continues to hone its competitive edge in the ASEAN motorcycle market by developing original technologies and pursuing cost reduction.

Note: The YM-JET-FI is mounted in the Jog Ciao 115cc scooter released in Taiwan in 2009.

China and India

China is the largest motorcycle market in the world, with annual demand exceeding 17 million units. Japanese motorcycle manufacturers entered the Chinese market in the 1980s and established many government joint-venture companies that helped expand local manufacturing. In addition, local makers also entered the motorcycle market, resulting in a total of more than 100 producers operating in China.

In India, unaffected by the currency crisis that shook the ASEAN region, demand has consistently increased. With annual production of more than 8 million units, India's motorcycle market is now the second largest in the world. Its mainstay motorcycles are fuel-efficient, 4-stroke models with engine displacement between 100cc and 125cc.

In China and India, Yamaha Motor has offered high-quality, high value added models, in a strategy designed to enhance the Yamaha brand image. The new medium-term management plan, however, calls for expanding the affordably-priced product lineup and increasing the models' percentage of total sales, in a drive to reach as many people as possible with Yamaha product value. Moving forward, the Company plans to globalize these more affordable models by exporting them to Turkey and Africa, while also introducing the same models in the ASEAN region and Latin America.

Production System

Japan: Motorcycle assembly factory at the head office

Europe: France, Spain

Asia: Indonesia, Thailand, Malaysia, the Philippines, Vietnam, India, China, Taiwan, Cambodia

Latin America: Brazil, Mexico, Argentina, Colombia

Completed vehicle assembly factories only. Excludes factories that receive technical assistance from Yamaha Motor.



Major Models



VMAX



Raider



TMAX



FZ16



LEXAM



YZF-R1



XJ6



FZ1 FAZER



WR250R



AXIS Treet

Marine Engines

Product Profile

Marine engines used to propel boats can be categorized into three types: outboard motors, stern drives (inboard-outboard motors), and inboard motors.

Yamaha Motor primarily manufactures and markets outboard motors for small vessels such as pleasure-use boats and utility boats. Outboard motors account for more than 90% of the Company's marine engine business.

Unlike automakers, who usually produce both the vehicle body and the engine, most manufacturers of marine engines do not produce the boats themselves.

Reference

Outboard motor

For small- and medium-size boats. The engine unit is mounted on the outside of the boat, and rotates the propeller to produce propulsion.



Stern drive (Inboard-outboard motor)

For small- and medium-size boats. The engine is mounted at the stern of the boat, and the drive unit is located outboard.

Inboard motor

For large boats. The engine is installed at the center of the hull, and the driving force is transmitted to the outboard propeller via a shaft.



Applications (User Profile)

Outboard motors for utility applications are mounted on a variety of boats, ranging from small utility boats to medium-size fishing vessels. Many fishermen depend on Yamaha outboard motors for their livelihood, and these motors are also used for coastal patrol and water transport applications, including taxi boats. Outboard motors for leisure applications are used to power a wide range of vessels, from small inflatable rubber boats to medium-size cruisers, and to provide the users with pleasure on the water.

Background of the Business

Yamaha Motor applied its small engine technology to produce the seven-horsepower P-7 outboard motor in 1960. For 50 years since then, the Company has been expanding the product lineup, while consistently improving power output, durability, and fuel efficiency, among other features. More than 90% of Yamaha outboard motors are exported to markets worldwide, where they are widely used in the fishing industry and for leisure applications. Yamaha outboard motors have enjoyed continuous growth in the global market: in March 2010, cumulative production of Yamaha outboard motors exceeded the nine million mark.

Yamaha outboard motors are used more commonly for leisure purposes in the United States and Europe, while they are essential in fishing and transportation applications in Africa, Southeast Asia and other areas. Yamaha Motor created its Enduro models for utility markets to help support fishery and improve the standard of living in developing countries. Supported by its OMDO (Overseas Market Development Operation Business Unit), the Company has been developing products that can perform in a variety of local waters, under harsh conditions and within the constraints of local fuel supplies. The Company has also helped improve the service system in the markets where it operates.



Current Business Conditions — Product Features and Technologies

During its 50 years of operation, Yamaha Motor has continuously expanded its product lineup and now offers a wide range of products encompassing 2-stroke models from 2 to 300 horsepower and 4-stroke models producing 2 to 350 horsepower.

The extensive product lineup meets diverse customer needs, and is a key to Yamaha outboard motors' widespread popularity.

Environmental regulations

Yamaha outboard motors for the U.S. market comply with California Air Resources Board (CARB) exhaust emission standards, considered the most stringent environmental regulations in the world. Yamaha fuel-injection-equipped 4-stroke models with 40 horsepower or more meet the CARB standards.

Production System

Medium- and large-size 4-stroke outboard motors and large-size 2-stroke outboard motors

Fukuroi South Factory, Marine Engine Business Unit, Marine Business Operations Location: Fukuroi City, Shizuoka Prefecture, Japan

Small-size 4-stroke outboard motors and small- and medium-size 2-stroke outboard motors

Yamaha Kumamoto Products Co., Ltd.

(YKP: manufacturing subsidiary)

Location: Yatsushiro City, Kumamoto Prefecture, Japan

Small-size 4-stroke outboard motors MBK Industrie (MBK: manufacturing subsidiary) Location: Saint-Quentin, France

Representative Models





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Personal Watercraft

Product Profile

Personal watercraft (PWC) became popular in the United States in the 1970s, and found their way into Japan in the 1980s. Unlike an outboard motor that uses propellers for propulsion, the PWC draws in water from the intake section located on the bottom of the hull, and shoots it out from the stern to move forward. PWC come in a variety of models, ranging from one to three riders capacity. Some require the rider to stand, while others are ridden from a seated position.

- Reference

In Japan, an operator's license for special small boats is required to operate personal watercraft.

Applications (User Profile)

The popularity of PWC has spread mainly among youths who ride them for fun and recreation. However, in recent years, larger, more powerful models have been released, influenced by the introduction of jet boats, among other factors. Today, PWC are not only used for their fun of riding but also for towing water skiers, offering a wider range of leisure uses. PWC are also used for rescue operations by lifeguards around the world.

Background of the Business

In 1986, Yamaha Motor developed and introduced a PWC that people could sit on and ride like a motorcycle on water, offering the enjoyment of the PWC to many more people.

Until then, cruising and fishing were the mainstream forms of marine leisure, but the introduction of PWC created new demand for marine sports.

Current Business Conditions — Product Features and Technologies

Yamaha Motor's PWC feature a high-stability body for superb seaworthiness — created by applying the Company's boat-making expertise — and a compact, lightweight yet powerful engine, backed by the Company's know-how and experience as a marine engine maker.

In spring of 2002, the Company introduced the FX140, the first model of its kind in the world to incorporate a 4-stroke engine. In 2008, Yamaha Motor released the FX Cruiser SHO, a high-performance model featuring a supercharged engine and a hull made of Nano Xcel, a lightweight material developed using nanotechnology.

Environmental concerns

To reduce impact on the environment, Yamaha 4-stroke models incorporate an electronic fuel injection system. These models meet U.S. EPA (Environmental Protection Agency) regulations and Japan Boating Industry Association voluntary regulations.



Production System

- Engines: Kuramatsu Factory, Water Vehicle Business Unit, Marine Business Operations Location: Hamamatsu City, Shizuoka Prefecture, Japan
- Hulls: Yamaha Motor Manufacturing Corporation of America (YMMC: manufacturing subsidiary) Location: Georgia, U.S.A.

Tennessee Water Craft, Inc. (TWC: manufacturing subsidiary) Location: Tennessee, U.S.A.

Representative Models



MJ-VX Cruiser



MJ-FX Cruiser SHO

Boats

Product Profile

Boats are used for two major purposes: business and leisure. Boats for commercial applications can be categorized into utility boats and fishing boats, and the hulls of these boats must be designed to fit the requirements of each region's fishing methods. Pleasure-use boats are also classified into two categories: powerboats (ranging from small trailerpulled boats to large cruisers) and sailboats (ranging from solo dinghies to large sailing cruisers). Yamaha Motor manufactures and supplies products in all these categories.

- Reference

In Japan, an operator's license for small boats is required to operate an engine-powered boat or sailboat (although no license is required if the boat is shorter than 3 m and the engine output is less than 1.5kW). Boat licenses are classified into three types: Class I, Class II, and Special Small Boat, according to the boat size and navigation distance. There are five qualification levels in the three license categories.

Applications (User Profile)

Commercial/utility boats play a vital role in the everyday lives of fishermen. Pleasure-use boats, on the other hand, are used for sport fishing, cruising, water skiing, and wakeboarding.

Background of the Business

Foreseeing the growth of boat demand for marine sports and leisure, Yamaha Motor actively researched and developed FRP (Fiberglass Reinforced Plastics) as a new material for hulls, jointly with Nippon Gakki Co., Ltd. (presently Yamaha Corporation), and began producing and marketing FRP boats in 1960.

In the same year, the Company started producing outboard motors. Since then, the Company has been expanding its marine product lineup, consisting of boats and marine engines that are designed to match and complement each other. Overseas, boat manufacturers usually produce only boats, and marine engine makers generally manufacture only engines. Companies that produce both are mainstream in Japan.

In 1965, the Company began producing sailboats and fishing boats. The Company has thus grown into a full-spectrum marine manufacturer, offering a full lineup of boats and outboard motors to meet the diverse needs of its customers.

Current Business Conditions — Product Features and Technologies

Delivering Reliable Quality and High Performance

Yamaha Motor not only builds top quality into its full lineup of boat models, but outstanding safety and superb performance. Products range from fishing boats and utility boats for commercial applications to pleasureuse boats for leisure and recreational activities.

High-Precision NC Technology for Machining and Molding

Complex hull shapes are designed to achieve maximum speed, safety and operational capability. To fabricate products exactly as intended by the designers and engineers, Yamaha Motor employs advanced molding techniques using numerical control (NC) technology. This enables highly accurate molding in order to produce original hulls with precise specifications based on three-dimensional (3-D) design data. Thus, NC technology completely eliminates loss generated when molding hulls using design drawings, and realizes precisely the production the original designers and engineers envisioned.



Original Design Technology, Extensive Analysis and Verification

In developing its boat hulls, Yamaha Motor uses a performance simulation and design system called Y.P.D.S. (Yamaha Performance Development System) — developed based on data accumulated over many years — together with 3-D CAD systems, in a comprehensive pursuit of higher performance and precision. The Company also utilizes FEM computer structural analysis and simulation technologies to examine various loads applied to the hulls, and

repeatedly conducts durability tests using prototypes. This is part of the Company's commitment to extensive analysis and verification before introducing new products to the market.

Leading-Edge Technologies for Next-Generation Products

Yamaha Motor actively develops and deploys leadingedge technologies designed to enhance safety and reduce environmental impact with its next-generation boats.

In the effort, the Company developed exclusive FOAMAP (Foam Manufacturing Process) technology that enables single-piece, triple-structure hulls. In FOAMAP production, high-density polyurethane is injected between FRP boards under high pressure. This method realizes superb buoyancy and rigidity, while significantly reducing the generation of environmentally damaging VOC (Volatile Organic Compounds) in the manufacturing process. Another original technology, the VARTM (Vacuum-Assisted Resin Transfer Molding) process — a closed molding process — used in the manufacture of bridges, achieves a 90% reduction in VOC in the molding process compared to the conventional method, thus helping promote environmentally-conscious production.

Production System

Fishing boats, utility boats: Yamaki Manufacturing Co., Ltd. Location: Yakumo-cho, Futami-gun, Hokkaido, Japan

Small boats, utility boats: Yamaha Amakusa Manufacturing Ltd. Location: Kamiamakusa City, Kumamoto Prefecture, Japan

Medium and large boats: YM Shido Co., Ltd. (Outsourced from Yamaha Motor Co., Ltd.) Location: Sanuki City, Kagawa Prefecture, Japan

Representative Models



EXULT 36 Sport Saloon



FR-23

Swimming Pools

Product Profile

In Japan, school swimming pools, competition pools, children's pools, and pools for leisure and health applications form the main demand in this segment.

By material, pools can be categorized into FRP (Fiberglass Reinforced Plastics) pools, metal pools, and concrete pools. Yamaha Motor's pools are made of FRP.

Applications (User Profile)

There are about 40,000 25m-size swimming pools installed in Japan, of which about 30,000 are school swimming pools. The rest are operated and managed by municipalities, fitness clubs, and swimming clubs, among other organizations.

Background of the Business

Yamaha Motor commercialized Japan's first all-FRP pool in 1974 by applying its FRP boat production technology. Since then, the Company has delivered more than 27,000 swimming pools throughout Japan.

The Company incorporates various user safety features such as a dispersed water intake system that keeps users safe from being sucked in by the filtration system; pool decks and ladder steps featuring slipless patterns; and ladder steps built directly into the side wall. In addition, the Company is applying innovative original technologies to protect FRP from the adverse effects of chlorine used to maintain water quality, including a resin hardening agent that resists chemicals and causes no chemical reaction.

The Company's efforts to create safe, hygienic comfortable swimming pools are widely recognized, and cumulative shipments of swimming pools to schools reached 5,000 units in 2007. The Company has become the top-ranked swimming pool maker in Japan.

Reference					
	Reference				
Character	istics of pool by material type				
FRP:	Strong and lightweight, FRP offers superior				
	workability that reduces construction time by				
	enabling on-site assembly and installation of				
	factory-fabricated pools.				
Metal:	Coating required to protect the material results in				
	high running costs.				
Concrete:	Initial costs are low, but concrete pools require				
	periodic repainting, driving up running costs.				

Current Business Conditions — Product Features and Technologies

Plans for the construction of swimming pools for the health-promoting purposes in public facilities operated by local governments and other organizations have been increasing in recent years, and the Company is expanding its market share in this business segment as well. Opening of public swimming pools broadens the range of users from small children to the elderly. The Company provides its expertise and know-how for the construction of such swimming pools in order to help promote healthy lifestyles and help create amenities for people of all ages.

The Company sees an emerging need for more community facilities to enable people to enjoy an aquatic environment and the water itself. In meeting this need, the Company is developing pools for hospitals and other healthcare institutions to encourage safe water exercise and rehabilitation for the older and physically challenged members of the community.

Pool Accessories

In addition to swimming pool units, Yamaha Motor also actively develops and markets pool-related equipment and systems. By offering quality products including various high-performance automatic vertical filtering systems, and benches with course rope storage compartments, and shower units, the Company provides total swimming pool system and environment solutions to its customers.

Maintenance and Management Services

Based on its installation track record and long accumulated expertise in this field, Yamaha Motor also offers maintenance and management services for public pools.

Environmental Concerns

Since April 2001, the Japan Reinforced Plastics Society (JRPS) has been researching a continuous recycling operation using a cement incineration process in a newly constructed plant. The study, conducted with the guidance and financial support of the Ministry of Economy, Trade and Industry of Japan, is based on the Waste FRP Product Recycling Verification Program.

As a member of JRPS, Yamaha Motor is participating in the continuous recycling program. It is ready to begin these recycling operations at its own plant.

Production System

Arai Site Location: Kosai City, Shizuoka Prefecture, Japan



Recreational swimming pool



School swimming pool



Aquatic exercise at a fitness center swimming pool



Unit: billion ¥





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All-Terrain Vehicles & Side-by-Side Vehicles

Product Profile

With their superb maneuverability on such varied terrain as dirt, sand, snow, and ice, all-terrain vehicles (ATVs) are 4-wheel off-road buggies. And, since they can go anywhere, they are capable of handling a variety of jobs in an array of fields — from work under tough conditions to agricultural applications requiring agility and maneuverability, and transportation uses demanding powerful performance and versatility.

ATVs are especially popular in North America, with its vast expanse of land, where they are used for sports, leisure touring, and utility work.

Reference –

In Japan, ATVs are not certified by the Ministry of Land, Infrastructure, Transport and Tourism; therefore, they cannot obtain license plates and are prohibited from operating on public roads.

Application (User Profile)

Broken down by application, about 60% of ATVs are used for hunting and other leisure activities, 20% for sports such as off-road riding, and 20% for utility work. This includes transporting cargo (work materials, lumber, harvestry, etc.), guiding domestic livestock, planting seeds and spreading fertilizers.

In the United States, many people use ATVs for more than agricultural and hunting applications. ATV racing, for example, is a popular pastime. In Canada, ATVs are also used in the forestry industry. In Europe, ATVs are used mainly in cattle breeding and agricultural and forestry industries, while rental ATVs are also available at some resorts in France and other nations in the region. In Australia and New Zealand, ATVs are used primarily for livestock and agricultural farming.

Background of the Business

ATVs basically incorporate motorcycle technologies, especially off-road bike technology. Sales of Yamaha ATVs began in the United States in 1984, and in Japan in 1986.

Current Business Conditions — Product Features and Technologies

The United States — with more than 50% of worldwide demand — has particularly large amounts of ranches, stretches of unpaved roads and natural terrain such as fields and marshes where ATVs perform well.

Yamaha Motor meets diverse needs with a wide range of products, including utility, sports, and youthoriented models.

Yamaha Motor has been marketing the Grizzly series 4WD ATVs featuring an electric power steering (EPS) system as a utility vehicle for a variety of outdoor leisure activities, as well as applications such as cargo transport and patrols.

Yamaha's sports models include the Raptor series and the YFZ450R.

In North America, Yamaha Motor introduced the 660cc side-by-side vehicle (SSV) — the Rhino 660 — in 2003. In 2007, the Company upgraded it by incorporating a fuel injection system and increasing its engine displacement to 700cc, and released it as the Rhino 700 in overseas markets.

Production System

Yamaha Motor Powered Products Co., Ltd. (YMPC: manufacturing subsidiary) Location: Kakegawa City, Shizuoka Prefecture, Japan

Yamaha Motor Manufacturing Corporation of America (YMMC: manufacturing subsidiary) Location: Georgia, U.S.A.

Representative Models



YFZ450R



Grizzly 550 FI FI: Fuel injection



Snowmobiles

Product Profile

The snowmobile originated in Canada, incorporating two skis at the front and two track belts at the rear for propulsion. It has developed into a vital means of transportation for people in snowy areas, and also a major source of winter sports enjoyment and leisure.

Yamaha snowmobiles are sold mainly in North America (the U.S. and Canada), Europe (Sweden, Norway and Finland), Russia and Japan. In addition to these seven nations, they have been also marketed in some 30 nations in recent years, including Austria, Switzerland, Ukraine, Kazakhstan, Mongolia, China, South Korea, and New Zealand.

Reference

Since snowmobiles are not certified by the Japanese Ministry of Land, Infrastructure, Transport and Tourism, they cannot obtain license plates in Japan. Therefore, snowmobiles cannot operate on public roads.

Although an operator's license is not required for snowmobiling in Japan, users should gain basic knowledge of the vehicles' structure and operation, riding rules and manners, and sufficient knowledge of the operating environment. Yamaha Motor promotes safe, comfortable riding through its snowmobile seminars — with instructors certified by the Japan Snowmobile Safety Association (JSSA). It issues a "Yamaha Snowmobile Certificate" to each participant who completes the lecture sessions.

Applications (User Profile)

Snowmobiles are used for three main purposes: for leisure, as rentals, and in commercial applications, although the relative percentage of each varies by nation. In Japan, in addition to racing, touring and rental at snowmobile riding facilities, snowmobiles are used to maintain lifelines such as mail delivery in areas where snow is not plowed on a regular basis, and for winter maintenance of power transmission lines in snowy areas. They are also used to spread snow-melting agents on cultivated areas and for fish farming in frozen lakes, thus helping improve harvests and catches.

Background of the Business

The first Yamaha snowmobile was developed in 1968, using the small engine technologies gained through motorcycle development. In 1970, Yamaha Motor introduced a leisure-use snowmobile model, thus pioneering the new field of recreational and sport snowmobiling. Since then, the Company has released many new models. Yamaha Motor is the only company in Japan that manufactures complete snowmobile units in-house.

Current Business Conditions — Product Features and Technologies

From the time Yamaha Motor introduced its first snowmobile — the SL350 — in 1968, the Company has been providing a wide range of products to meet user demand for winter sport, leisure and business applications. The 2008 year models mark the 40th anniversary for Yamaha snowmobiles.

Yamaha Motor has stayed a step ahead of the competition by aggressively promoting snowmobiles that incorporate 4-stroke engines. In 2002, the Company released its first 4-stroke snowmobile, the RX-1, mounted with a liquid-cooled DOHC 4-cylinder engine. The unique engine helped the product earn high acclaim for its excellent riding and environmental performance. By continuously developing and deploying 4-stroke models for diverse applications and terrain conditions, the Company has been solidifying the popularity of Yamaha 4-stroke snowmobiles.



Yamaha unit sales

Unit: thousands



Note: *Yamaha surveys



Production System

Motorcycle assembly factory at the head office Location: Iwata City, Shizuoka Prefecture, Japan

Representative Models



FX Nytro R-TX



APE X-TX

Golf Cars

Product Profile

Since golf cars reduce the burden on caddies, meet the increased requirements of the aging golf population, save labor, let golfers transport their own clubs, and encourage smoother, more enjoyable rounds, they have become popular on golf courses today.

Yamaha Motor develops its golf car models to respond to an array of needs. It offers an extensive lineup, with different versions designed to accommodate one, two, or as many as five people. Some Yamaha golf cars are equipped with a gasoline engine and others with an electric motor. Users can choose models featuring either an electromagnetic induction or a manual operation system.

Applications (User Profile)

In Japan, many golf courses use five-passenger golf cars to increase management efficiency and meet customers' needs. These models carry players and caddies in addition to golf clubs.

In the United States, where golf is a popular sport, the demand is highest for two-passenger models.

Background of the Business

In 1972, Yamaha Motor began developing a land car for use at the Company's Tsumagoi resort (Kakegawa City, Shizuoka). Later, the Company started developing golf cars, and introduced the YG292 two-passenger gasoline engine golf cars in 1975. Since then, the Company's golf car business has expanded. To respond to growing demand, the Company constructed a plant in Georgia (USA) in 1988 for the production of two-passenger golf cars, in addition to the plant for the manufacture of five-passenger golf cars in Japan. With both plants producing the popular golf cars, cumulative production reached one million units.

Current Business Conditions — Product Features and Technologies

Yamaha Motor introduced the Turf Joy G15-A 5-passenger golf car in 1994, and followed with the Turf Liner G17-A in 1996, which was based on the G15-A and incorporates an electromagnetic induction system^{*1}.

Next, the Company introduced the Turf Liner G17-E with a battery-powered electric motor in 2000. It has attracted attention in the industry for its quietness and powerful performance.

In 2005, the Company released the G30A/E and G31A/AP with five color variations and a host of options, including a sliding window shield. In 2006, the Company upgraded the G30E by incorporating a new controller, designed for enhanced comfort and ease of operation.

The Company released The Drive — featuring the industry's first mechanical wet brake^{*2} — in the United States in 2006. This model has been marketed in Japan and other countries in 2007 as the YDR.

Notes: *1 Electromagnetic induction system

Yamaha Motor's electromagnetic induction system uses a sensor mounted on a golf car to detect and automatically trace the electromagnetic field generated by an AC current flowing through a cable buried underground. It offers a high level of safety, and enables remote-control operation of the golf car.

*2 Mechanical wet brake A wet-type multi-disc brake system. Multiple brake discs are installed inside the transmission case, and braking presses these discs to provide braking force.

Production System

Yamaha Motor Powered Products Co., Ltd. (YMPC: manufacturing subsidiary) Location: Kakegawa City, Shizuoka Prefecture, Japan

Yamaha Motor Manufacturing Corporation of America (YMMC: manufacturing subsidiary) Location: Georgia, U.S.A.

Representative Models



Turf Liner G30E



YDR/The Drive



Generators

Product Profile

Generators are used in utility applications and as emergency power sources. Use of generators for leisure purposes has also been increasing in recent years. They use engines to produce electricity, powering electric equipment and appliances outdoors where a commercial power supply is not available. Yamaha Motor offers a wide range of products, mainly 4-stroke models, ranging from 1 kVA to 6 kVA class.

Sales of high-performance inverter-type generators*, which can be used to power precision machines, have been growing in recent years.

Note: *Inverter-type generators

An inverter-type generator consists of a converter — which converts 3-phase AC power to DC — and an inverter section that converts the power back to AC.

Compared to capacitor-compensation and other conventional generators, the inverter-type offers a number of advantages: (1) Inverter-type generators are light and compact. (2) They run quieter, with higher fuel efficiency, thanks to the Economy Control system, which adjusts engine output to the load. (3) They provide a stable supply of high-quality electric power, equivalent to a commercial power source, ensuring the use of personal computers and other precision electronic equipment that cannot be safely powered by conventional generators. (4) Inverter-type generators support switchable 50/60-Hz power supply frequency.

Applications (User Profile)

In business applications, generators supply electric power to tools and lights at construction sites. They also serve in camping and other outdoor leisure and recreational uses.

In addition, as awareness of disaster preparedness increases, generators are being used as an emergency power source in a variety of applications.

Background of the Business

Yamaha Motor began developing generators based on its small engine technology, and introduced its first 2-stroke model in 1973. In 1977, the Company released a 4-stroke model. Yamaha Motor has since been expanding its lineup of generator models for both business and leisure uses.

Current Business Conditions — Product Features and Technologies

Yamaha Motor offers an extensive lineup of quiet, highoutput generators, from lightweight compact models to large industrial units. Yamaha generators are widely used around the world.

They offer high-quality electric power, quiet operation and high fuel efficiency in addition to outstanding basic performance. The simple, userfriendly EF Inverter series easily adapts to various operating environments, while the EF Standard series is designed for high durability and reliability with maximum functionality of 4-cycle engines.

Meanwhile, the Company is actively incorporating environmental features in its generators to meet the voluntary regulations set by the Japan Land Engine Manufacturers Association, and other strict emissions standards adopted around the world. The Company is also focused on the development of quiet models.

Production System

Yamaha Motor Powered Products Co., Ltd. (YMPC: manufacturing subsidiary) Location: Kakegawa City, Shizuoka Prefecture, Japan

Fuzhou Jiaxin Soqi Power Products Co., Ltd. (Manufacturing subsidiary) Location: Fujian, China

Representative Models



EF1600iS



EF4000iSE

Snow Throwers

Product Profile

Snow throwers are used to clear snow from front yards and roads in snow-bound areas such as the Hokkaido, Tohoku, Kita-Kanto, Hokuriku, Koushinetsu and Sanin regions in Japan. Yamaha Motor offers various snow thrower models, from compact home-use units to large models suited for business operators.

Applications (User Profile)

Home-use snow throwers serve to remove snow from the entrances of homes and garages, while business-use models are utilized to remove snow from storefronts and large parking areas.

Background of the Business

To relieve people in snow-bound regions from the exhausting task of snow removal, Yamaha Motor developed snow throwers based on the small engine technology gained through producing motorcycles, and introduced its first snow thrower in 1978. Since then, Yamaha snow throwers have become so popular that they are simply known as "the blue snow throwers" for their product color.

Current Business Conditions — Product Features and Technologies

Yamaha Motor offers a total of 11 snow thrower models, ranging from a 2-horsepower home-use unit to a 13-horsepower business-use model. The Company is working to enhance the cold-weather performance of its snow throwers by applying snowmobile manufacturing expertise and materials designed to withstand very low temperatures. These include resins used in the body, tracks, and other areas of the snow-thrower.

Yamaha snow throwers featuring the Company's proprietary low-noise technology are highly rated by users for their excellent performance.

In 2009, the Company bolstered the snow-thrower lineup with the YU-240, its first model incorporating a simple sled-type system for easier operation.

Production System

Engines: Yamaha Motor Powered Products Co., Ltd. (YMPC: manufacturing subsidiary) Location: Kakegawa City, Shizuoka Prefecture, Japan

> Yamaha Motor Taizhou O.P.E. Co., Ltd. (YMTO: manufacturing affiliate) Location: Jiangsu, China

Representative Models



YU-240



YS-1390AR

Racing Kart Engines

Product Profile

There are many types of karts, ranging from go-karts used in amusement parks to full-fledged competition racing karts.

Many people enjoy karts as entry-level racing machines, the first step on the road to more challenging motorsports competitions, with Formula One at the apex. For both racing and leisure purposes, kart riding events and racing contests are held on dedicated kart courses. A racing kart is equipped with only the bare minimum required for the machine to run — the engine, tires and a seat — and it is very close to the ground. Therefore, karts offer a special kind of speed thrill that makes drivers feel like they are going faster than they actually are.

Applications (User Profile)

Racing karts are popular among people of all ages, with the kids and teens segment (8-15 years) expanding rapidly in recent years, primarily because more rental kart courses are being built nationwide. Racing competitions held year-round — for competitors ranging from novices to international-class drivers are another big draw.



Background of the Business

Capitalizing on its motorcycle technology, in 1973 Yamaha Motor developed and marketed its first complete kart, equipped with both an engine and frame manufactured in-house. In 1974, the Yamaha SL (Sports and Leisure) Kart Club was launched to help popularize kart sports. Today, the Club has about 15,000 kart license holders. The Company believes that providing driving pleasure to more people is one of its social missions.

Current Business Conditions — Product Features and Technologies

The only Japanese manufacturer that produces kart engines in-house, Yamaha Motor markets these engines worldwide.

The Company is also working hard to promote karts. The Yamaha Kart Works Team has trained many noted professional racers active in Japan and overseas, including one-time Formula One drivers Aguri Suzuki and Toranosuke Takagi.

An agreement to strengthen the business tie-up with Toyota Motor in 2000 also calls for the two companies to collaborate in motorsports. One such joint effort is the Toyota-Yamaha Scholarship System, established to develop a crop of young and talented racing kart drivers.

Production System

Engines:Yamaha Motor Powered Products Co., Ltd. (YMPC: manufacturing subsidiary) Location: Kakegawa City, Shizuoka Prefecture, Japan

Representative Models

Y7125K









WR250FK

Electric Wheelchairs

Product Profile

Wheelchairs help disabled and elderly people gain mobility. There are two types of wheelchairs manually-propelled and electrically powered versions. Yamaha Motor presently markets supplementary drive power assist units to be mounted on handpushed wheelchairs, as well as complete wheelchairs incorporated with power assist units, and electric wheelchairs, including a model designed to reduce the exertion required for a caregiver to push the chair.

Applications (User Profile)

Wheelchairs are certified prosthetic appliances used by the disabled. Under the long-term care insurance system introduced in Japan April 2000, an increasing number of elderly people are using rental wheelchairs, which are covered by insurance.

Background of the Business

Yamaha Motor is working to improve public health and welfare, and to help meet the challenges facing Japan's aging society. In its commitment to fulfilling this social mission, the Company has long sought to increase mobility for people in wheelchairs. Since the early 1990s, Yamaha Motor has been applying its original control and drive technologies to the development of the JW series electrical power unit for manuallypropelled wheelchairs.

In 1995, the Company began limited-area marketing of the first in the series — the JW-I — designed to convert a standard wheelchair to an electrically power assisted version. It began marketing the JW-1 in October 1996, marking its full-fledged launch into the wheelchair business. In January 2006, the Company released the JWX-1, an all-new version of the JW-I that offers greater ease of use.

Yamaha Motor has simultaneously pursued another track in the drive for improved wheelchair mobility. In November 1996, the Company introduced the JW-II electrical power assist unit for the hand-operated wheelchair. The JW-II automatically supplements the propulsion of the manual wheelchair with electric power supplied by the Power Assist System (PAS). The power assist allows users to drive their wheelchairs with less physical effort. In March 2001, the Company marketed the Towny PAS electrically power assisted wheelchair, which provides supplementary electric driving power to make it easier for the caregiver to push. The Towny Joy, a lightweight model with 16-inch wheels, introduced in April 2004, offers enhanced comfort and convenience and also reduces the burden on caregivers. An upgraded successor, the Towny Joy X, which was introduced in April 2010, features improved functionality.

Current Business Conditions — Product Features and Technologies

Electrical Power Assist Units for Wheelchairs

Yamaha Motor offers power assist units for wheelchairs that can easily be installed in manual wheelchairs. The JW-I, JW-II and Joy Unit X can either electrically power a manual wheelchair, or provide an electric power assist.

JW Active and Towny Joy X — Ultra-lightweight, Electrically-powered Wheelchair

These models are lightweight electric wheelchairs that not only reduce the burden on the caregiver but also offer easy use. Moreover, they are ergonomically designed to make it easy for the user to get in and out of the wheelchair and transfer to and from bed.

Electro-hybrid Towny PAS Designed for Easy Operation by Caregivers

The Towny PAS wheelchair incorporates the same Power Assist System (PAS) used in the Company's electrically power assisted bicycles to make it easier for caregivers to push the wheelchair.

The Towny PAS provides the proper degree of power assistance to drive the wheelchair, based on the force being applied by the caregiver. This significantly reduces the physical power required to push the chair.

Production System

IM Business Unit Location: Hamamatsu City, Shizuoka Prefecture, Japan

Representative Models



JW Active



JWX-I Electrical power assist units for wheelchairs

PAS (Electrically Power Assisted Bicycle)

Product Profile

The Yamaha PAS is an electrically power assisted bicycle — a vehicle equipped with a compact electric motor and a battery. The motor provides supplementary power in response to the rider's pedaling effort, reducing the required pedaling force when riding uphill, against the wind, or from a standing start.



Applications (User Profile)

Yamaha PAS electrically power assisted bicycles are used by people of various ages. Parents run their kids to and from kindergartens on the Yamaha PAS, while housewives and older people can use them to get around the neighborhood. They also serve as commuter vehicles for students and working people. Others use Yamaha PAS in their health and fitness program, making the PAS a good partner in an era of increasing health consciousness.

Amid growing concern for the environment, municipalities as well as government and corporate offices are using Yamaha PAS bicycles in their daily operations, in addition to personal uses.

Background of the Business

Since the 1980s, the Company has been searching for solutions to social issues involving energy, the global environment, chronic traffic congestion, and an aging society. One focus of the effort has been the bicycle, the most basic form of personal transportation, and perhaps the most versatile. In its strategy, the Company has sought to develop a new personal commuter vehicle that could effectively overcome the fundamental drawbacks of the bicycle strenuous pedaling uphill, against the wind, and when carrying cargo — while maintaining bicycle's utility and convenience. The result was the Yamaha PAS electrically power assisted bicycle.

Guided by the corporate mission *"Kando* Creating Company," the Company pursued the following themes in developing the PAS electrically power assisted bicycle.

- 1) Helping society by making people's lives more convenient
- 2) Helping solve local environmental and energy problems
- 3) Helping mitigate chronic traffic congestion

The development target for the Yamaha PAS electrically power assisted bicycles was "people-friendly, environmentally friendly vehicles." Technologically, this meant the harmonious integration of human power and sensitivity with mechanical force.

Current Business Conditions — Product Features and Technologies

Yamaha Motor developed and marketed the firstgeneration PAS in 1993, a breakthrough product on the international marketplace. Since the introduction of this, the world's first electrically power assisted bicycle, the Company has been improving the performance of the PAS, while maintaining the original development policy calling for building a vehicle that places human sensibilities first. In order to provide a better "assist" feel to users, the Company has made many improvements and refinements in the PAS. These include reduced product weight, shorter charging time, a simplified charging process, extended cruising distance per charge, a new pricing system, and expanded riding modes. Cumulative shipments reached one million units at the end of 2008.

On December 1, 2008, the Japanese government revised the law regulating the assist rate of electrically power assisted bicycles. The maximum ratio of pedaling force to assist power was l to l or less at speeds lower than 15 km/hour in the previous version of the law. The new revision changed this maximum assist ratio to 1 to 2 or less at speeds under 10 km/hour. Yamaha Motor responded by applying the original control technology it developed over many years to create new PAS models that comply with the new regulation. These products further reduce pedaling effort at startup and on a steep slopes, for an easier, more convenient, comfortable ride.

In July 2009, the Bicycle Association (Japan) established a safety standard for bicycles with two infant seats. A series of PAS models that comply with this standard have been released in rapid succession after public safety commission regulations were revised and implemented by prefectures.

The Yamaha PAS is used by people with different degrees of physical strength and varying objectives. To meet these diverse needs, the Company offers a broad range of PAS models, with a product suited to every customer. Each model delivers the optimum assist power level, battery capacity and cruising distance for the most comfortable use. Meanwhile, the Company is making changes in the bicycle design and color scheme to offer greater variety in the product line.

PAS Technology Finding Application in Clean Energy Vehicles

The advanced control technology used in the Yamaha PAS for the smooth integration of human and electric power has been applied to various products such as electric power units and auxiliary electric power assist units for conventional manual wheelchairs, and electric commuter vehicles. Today, alternative fuel vehicles are attracting a great deal of attention because they reduce environmental impact and promote effective use of resources. Yamaha Motor will maximize the technologies developed with the Yamaha PAS to create environmentally friendly products in the future.

Production System

Power units:

Yamaha Motor Electronics Co., Ltd. (YEJP: electric parts manufacturing subsidiary) Location: Morimachi, Shuchi-gun, Shizuoka Prefecture, Japan

Bicycle frames:

Outsourced production by Bridgestone Cycle Co., Ltd.

Representative Models



PAS CITY-C Lithium (left), PAS CITY-X Lithium



Surface Mounters & Industrial Robots

Product Profile

At Yamaha Motor, the business segment centering on surface mounters and industrial robots is called the IM (Intelligent Machinery) business.

Surface mounters are robots which are designed to mount electronic components on printed circuit boards for use in cellular phones, personal computers and other electronic products. These devices can be classified into high-speed and general-purpose machines. The Company mainly develops and manufactures general-purpose, medium-size surface mounters. Yamaha high-performance machines can mount electronic components of various sizes and shapes on printed circuit boards at high speed and with high precision.

Meanwhile, industrial robots can be divided into three categories: single-axis robots used for parts transportation and assembly, Cartesian robots designed to perform more advanced tasks, and horizontal multijoint (SCARA) robots, which can perform complex jobs.



Applications (User Profile)

Surface mounters are used mainly in facilities manufacturing personal computers, cellular phones, home appliances including DVD players and automobile parts, while industrial robots are also used in a variety of production sites, ranging from largescale plants to workshops.

Background of the Business

Yamaha Motor began research and development of industrial robots in 1974, in order to streamline the production and assembly of its motorcycles and improve manufacturing precision. In 1976, the Company developed its own SCARA robots to assemble parts, and introduced them in its in-house motorcycle production line. With the success of these projects, the Company entered the industrial robot business in 1981. The Company has since developed a diverse line of robots, and began marketing surface mounters in 1987. In September 2007, surface mounter cumulative sales reached 20,000 units.

The Company obtained part of the business of Tenryu Techniques Co., Ltd., the third largest surface mounter maker in the Japanese industry in 2000. The Company then established i-Pulse Co., Ltd. as a wholly owned subsidiary, in another move to strengthen its position in the surface mounter industry.

Current Business Conditions — Product Features and Technologies

Surface mounters, the mainstay of Yamaha Motor's IM business, are high-speed modular units that boast superb mounting speed. In both standalone applications and multiple-unit configurations, the ability of Yamaha surface mounters to connect with other equipment offers still greater efficiency. Yamaha Motor is the industry leader in general-purpose surface mounters with a lineup offering exceptional precision, speed and versatility.

In 2006, the Company moved into the high-speed mounter segment when it developed the YG300 surface mounter, which has achieved the industry's highest throughput of 105 thousand chips per hour. At the same time, the Company expanded the product lineup by adding printed circuit board testers and handlers, screen printers and other products. As a comprehensive manufacturer of chip mounting equipment, the Company is actively promoting business operations in this field.

Production System

IM Business Unit Location: Hamamatsu City, Shizuoka Prefecture, Japan

i-Pulse Co., Ltd. (Manufacturing subsidiary) Location: Hamamatsu City, Shizuoka Prefecture, Japan

Sales Routes

Yamaha Motor sells surface mounters through its distributors worldwide.

For the European market, the Company began OEM supply of surface mounters in 1987 to Assembléon B.V., a wholly owned subsidiary of Royal Philips Electronics N.V. of the Netherlands.

Representative Models



YS24 Compact high-speed modular surface mounter



YSi-12 Optical printed circuit board tester



YK180XG SCARA robot



Cartesian robot NXY

Automobile Engines

Product Profile

Yamaha Motor manufactures and supplies highperformance automobile engines for automakers inside and outside Japan.

Background of the Business

Ever since its founding, Yamaha Motor has been actively involved in racing as a working laboratory for the development of motorcycle engine technology. At the same time, the Company has conducted basic research and experimentation in the area of automobile engines.

In 1967, the Company entered a development and manufacturing venture for the Toyota 2000GT sports car together with Toyota Motor Corporation. Subsequently, the joint efforts of the two companies led to the development of the Toyota 1600GT and the Toyota 7. Presently Yamaha Motor supplies engines to Toyota Motor Corporation and AB Volvo.

The Company also participated in the Formula One, the world's premier car racing series, for nine seasons from 1989. The expertise gained through the racing challenge contributed greatly to the technological development of the Company's production engines.

Current Business Conditions — Product Features and Technologies

Based on the engine technologies gained through the motorcycle business, Yamaha Motor specializes in designing high performance, high RPM, high power engines, primarily suited for sports cars.

The Company has also developed a new automobile suspension technology — called the Relative Absorber System (REAS) — and a Performance Damper damper braces for automobiles — both of which are highly renowned by the industry. In 2000, REAS received an award^{*1} from the Society of Automotive Engineers of Japan. The Toyota Hilux Surf, introduced in August 2002, incorporated the X-REAS, an upgraded version of the REAS. In the X-REAS, the front and rear shock absorbers are diagonally linked to achieve optimal distribution of the vehicle weight across the four wheels, and optimal control of the vehicle's dynamic motion.

The Performance Damper won the Chairman's Award at the third "Prize for Promoting Machine Industry^{*2}" held in 2005. It also received the Technological Development Award at the 56th "Society of Automotive Engineers of Japan Awards" in 2006, and the Contribution Award at the 40th "Ichimura Industrial Award^{*3}" presentation in 2008.

Notes: *1 Award from the Society of Automotive Engineers of Japan

Since 1951, the Society of Automotive Engineers of Japan, Inc. has been presenting awards to excellent new products and technologies that contribute to the advancement of automotive engineering.

*2 Prize for Promoting Machine Industry

The Japan Society for the Promotion of Machine Industry established this award to promote development of technologies by the machine industry in Japan. Judges evaluate technologies developed by large corporations and small-/medium-size companies on equal footing on the criterion of advancing technical development standards.

*3 Ichimura Industrial Award

The New Technology Development Foundation presents this award to individuals and groups involved in technology development who have helped advance science and technology, industry, and culture, improved safety and well-being in Japan, in addition to realizing achievements in developing excellent domestic technologies.

Production System

Assembly: Iwata Main Factory Location: Iwata City, Shizuoka Prefecture, Japan Processing: Fukuroi Factory Location: Fukuroi City, Shizuoka Prefecture, Japan





Performance Damper

Unmanned Industrial Helicopters

Product Profile

Yamaha Motor markets RMAX Type II and Type IIG unmanned agricultural-use helicopters, mainly for crop dusting. The Company also offers results-based contract work, such as surveys and observations, in a variety of fields. In its contracted services, the Company applies expertise and know-how acquired through years of developing unmanned helicopters.

Applications (User Profile)

For agricultural applications, major users of Yamaha unmanned helicopters include municipalities, National Federation of Agricultural Co-operative Associations, agricultural co-operatives, crop-dusting organizations and individual farmers. Yamaha unmanned helicopters spray chemicals effectively to reduce labor and improve productivity.

Yamaha Motor also takes advantage of the unique characteristics of unmanned helicopters in survey and observation applications. The Company does business involving land preservation surveys and disaster prevention research at the request of municipalities, university research institutions and other organizations.

Background of the Business

In 1983, Yamaha Motor was commissioned by the Japan Agricultural Aviation Association, an organization affiliated with Japan's Ministry of Agriculture, Forestry and Fisheries (at that time), to develop an unmanned helicopter. It is designed to compliment manned helicopters in agricultural crop dusting operations.

In 1987, the Company established a new business division for full-scale marketing of the R-50. In 1989, the Company established a new business division (current *Aeronautic Business Development Section, Business Development Managing Unit*), in order to promote its full-scale marketing.

Current Business Conditions — Product Features and Technologies

Excellent Operability and High Payload Capacity In 1995, Yamaha Motor developed the Yamaha Altitude Control System (YACS) by applying control technology, one of its core competencies. This original system combines an optical fiber gyro and an accelerometer to control the helicopter's attitude and altitude. YACS has significantly improved helicopter operability, making operation accessible to people without special skills and training.

In 1997, the Company introduced the RMAX model, with an improved payload capacity. Its successor, the RMAX Type II G, launched in April 2003, features a new GPS-based speed control function for easier operation.

Yamaha Motor is the industry leader in unmanned helicopters, contributing to the modernization of agriculture in Japan.

Production System

Engines, Transmissions, etc.: Yamaha Motor powered Products Co., Ltd. (YMPC: manufacturing subsidiary) Location: Kakegawa City, Shizuoka Prefecture, Japan

Control, electric related: Yamaha Motor Electronics Co., Ltd. (YEJP: electric parts manufacturing subsidiary) Location: Morimachi, Shuchi-gun, Shizuoka Prefecture,

Japan

Sales Routes

Yamaha Skytech Co., Ltd., a sales subsidiary of Yamaha Motor, sells, promotes and services Yamaha unmanned helicopters through its 19 dealers nationwide.

Representative Models



RMAX Type IIG

Life Science Business

Product Profile

Astaxanthin, a carotenoid produced by *Haematococcus* algae through photosynthesis, is a beta-carotene and a red natural pigment. Yamaha Motor has been focusing on astaxanthin, and has developed a proprietary large-scale cultivation technology and mass-production system for astaxanthin preparation, called PURESTA.

Applications (User Profile)

PURESTA is gaining interest as a raw material for health supplements and cosmetic products. Yamaha Motor began full-scale supply of PURESTA astaxanthin preparation to supplement, food and cosmetics manufacturers in October 2006.

The Company is striving to fulfill its social mission — helping people enjoy a long, healthy life and increasing well-being — by applying the biotechnologies it has developed over years of research. Supplying PURESTA astaxanthin preparation represents another step in that direction.

Background of the Business

As a manufacturer and seller of motorcycles and products powered by small engines, Yamaha Motor has been in the forefront addressing global environmental issues. In addition to conducting engineering studies toward reducing the environmental impact of engines, and developing electric vehicles and fuel cells, the Company has been vigorously researching in the biotechnology field since 1997.

In the course of its research, the Company focused on the photosynthesis function of microalgae, and announced the development of technologies for absorbing and fixing carbon dioxide using microalgae in 2002. With the new process, the Company realized high-density, large-scale cultivation of a diatom called Chaetoceros calcitrans, a rare marine bait essential for the larval stage of shellfish in aquaculture. While researching and developing practical applications to commercialize this technology, the Company took notice of *Haematococcus* algae, which contains astaxanthin in high concentration. In 2005, the Company established another proprietary mass cultivation and indoor production system for the astaxanthin algae.

Current Business Conditions — Product Features and Technologies

Although astaxanthin occurs in a variety of aquatic wildlife, such as microalgae, shellfish and fish, it has been considered difficult to obtain stable yields of astaxanthin as raw material in large quantities using conventional techniques.

Yamaha Motor developed the "Yamaha Highefficiency Bio Reactor," an original production system for indoor cultivation of microalgae using artificial light and advanced fluid control technology. The Company incorporated the Bio Reactor and other cuttingedge technologies in its production facility, while establishing a manufacturing system in compliance with Japan's Good Manufacturing Practice (GMP) guidelines for raw materials in health foods. With this approach, the Company has achieved a stable supply of safe, high-quality astaxanthin in a high concentration (8%, as astaxanthin dialcohol).

The Company's astaxanthin raw material manufacturing plant commenced full-scale operation in October 2006. On the same premises, the Company has constructed the Life Science Laboratory, the research and development center for its Life Science business. By integrating R&D and production in this way, the Company aims to achieve higher productivity.

Production System

Life Science Division, New Business Development Section, Business Development Managing Unit Location: Fukuroi City, Shizuoka Prefecture, Japan

Sales Routes

Yamaha Motor supplies astaxanthin as a raw material to manufacturers in fields including foods, supplements, and cosmetics. It also sells astaxanthin supplements through mail order.

Representative Products

Astaxanthin preparation

- PURESTA Oil80
- (oil preparation)
- PURESTA W-05
- (water-soluble preparation)

Astaxanthin supplement

•ASTIVO





Other Products

Parts and Accessories

Yamaha Motor sells genuine parts for its motorcycles, marine and other products, as well as accessories such as helmets and apparel.



Pleasure-use Boat Mooring Equipment

The Company sells equipment used in marina applications, such as pontoons.



Oil Separator

Yamaha Motor markets high-performance oil separators (for industrial applications and kitchens use) that separate oil from water without producing any new waste materials.



Water Purifiers

Yamaha Motor began developing water purifiers for Southeast Asia and other regions where there is an insufficient supply of quality water. Recently, the Company also started supplying home-use water purifiers for the domestic market.



Seawater Sterilization Device

Yamaha Motor markets seawater sterilization devices designed to reliably sterilize natural seawater to provide a source of clean seawater for various fishery applications.







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