

Strategic Business Innovator

About the Preparatory Company for Establishment of a Semiconductor Foundry

July 5, 2023 SBI Holdings Inc.

Representative Director, Chairman, President & CEO

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- 1. About the preparatory company for establishment of a semiconductor foundry
- 2. Reason why SBI Group decided to establish a new company in the field of semiconductor



1. About the preparatory company for establishment of a semiconductor foundry

Jointly Establish a Preparatory Company for Establishment of a Semiconductor Foundry ("JSMC") in Japan with PSMC a Major Semiconductor Foundry of Taiwan



- Selecting a location for the factory, developing business plans, procuring funds, etc.
- Begin recruitment to secure human resources
- Related patents and other intellectual property are owned by the Preparatory Company

Details regarding the start of construction and operation of the plant will be announced as soon as they are finalized

Details of the Memorandum of Understanding (MOU) Concluded Today



Business to be carried out by the joint venture (JV)

- ✓ SBI Group and PSMC Group to jointly study the initial configuration of the plant
- ✓ Focus on automotive IC chips using the <u>mature logic technology nodes</u> of 40nm and 55nm in the short term
- ✓ Endeavor towards <u>high added value</u> by moving to WoW (Wafer-on-a-Wafer) <u>3D stacked</u> <u>wafers</u> as well as process node of 28nm and below in the medium term
- Establish a <u>research institute</u> to develop more advanced semiconductor technology in the long term

SBI Group and PSMC Group provide various management resources to the JV

<SBI Group>

- Lobbying the Japanese government for potential support, including government subsidies, land and infrastructure availability, and tax incentives
- Assist in complying with local regulations and obtaining necessary government approvals as needed
- <u>Arrange financing</u> from potential investment partners, including strategic fabless partners
- ✓ Advice on factory <u>site selection</u>

<PSMC Group>

- Provide various PBTO (Plan, Build, <u>Transfer and Operate) services</u> during the start-up phase ① Dispatch of factory planning and construction teams ② Transfer of technical information ③ Factory operation ④ Training for local employees of the JV
- Providing licenses and consulting on specific process technologies as agreed between the parties in a forthcoming definitive agreement



Now is the Perfect Timing to Enter the Semiconductor Field

- The timing vouchsafed by heaven, the advantage of land, and the harmony of people -

Timing Vouchsafed by Heaven

Advantage of the Land

Harmony of People

- The Japanese government has positioned the semiconductor industry as a national industry
- U.S.-China struggle for supremacy in the semiconductor field
- Increased geopolitical risk due to unipolarity in Taiwan
- Semiconductor miniaturization processes are reaching their limits
- Increase in global semiconductor demand due to advances in AI, DX, IoT, EVs, etc.
- Japan has many semiconductor-related companies with high international market share
- Japan has many demanders in automotive, biotech, AI, etc.
- Abundant water, land, logistics, electricity and other infrastructure
- JV with PSMC, Taiwan's 3rd largest and the world's 6th largest semiconductor foundry
- Abundant semiconductor engineers in Taiwan, enabling human resource development in Taiwan and dispatch of highlevel human resources from Taiwan
- SBI Group can provide investment and financing opportunities to many regional financial institutions through this project



2. Reason why SBI Group decided to establish a new company in the field of semiconductor

- (1) Consider Entering New Business Fields that Generate Synergistic Effects with Existing Businesses
- (2) SBI Group's contribution in the financial field
- (3) The Japanese Government focuses on the semiconductor field as a national policy
- (4) The market targeted by the new company that we will establish
- (5) Building a robust ecosystem for the semiconductor industry in Japan by leveraging the strengths of Japan's semiconductor infrastructure
- (6) SBI Group Will "Go Beyond Finance with Finance as its Core"



SBI Group Will Consider Entering Business Areas That Have Synergistic Effects With Existing Businesses and Meet the Following Challenges

- Fields that contribute to regional revitalization, such as generating income and employment in the region
- Fields contributing to efforts to attract a global financial center to Osaka
- Fields with synergistic effects for the establishment of the "Osaka Fintech Center", a cluster of fintech companies in the Kansai region
- Fields where financial functions, such as financing, are required

Consider support for the semiconductor industry in Japan as an area that can encompass the above items in a composite manner

(1) Consider Entering New Business Fields that Generate Synergistic Effects with Existing Businesses

Semiconductor Business Needs Enormous Financial Resources



- Lessons Learned from the Bankruptcy of Elpida Memory, Inc. -

The Japan-U.S. Semiconductor Agreement of 1986-1996 was based on ① foreign-made semiconductors having at least a 20% share of the Japanese market and ② a ban on low-priced sales by Japanese manufacturers, and Japan rapidly lost its international competitiveness from the 1990s onward

Elpida Memory, Japan's only DRAM (semiconductor memory) manufacturer, filed for bankruptcy protection on February 27, 2012

(Total debt was JPY 448bn, the largest corporate failure at the time)

[Reasons for bankruptcy]

Deterioration of business conditions due to global economic instability after the Lehman Shock, the historic appreciation of the yen, and the resulting significant drop in semiconductor prices

➡ JPY 30bn of public financial assistance as the first project under the Act on Special Measures concerning Industrial Revitalization in 2009 (Development Bank of Japan invested JPY 30bn and provided JPY 10bn in loans)

➡<u>Discontinue of governmental public subsidies</u> (until end of March 2012)

- ➡Loss of competitiveness and deteriorating earnings due to declining financial strength
- ➡ In July 2012, Micron Technology of the U.S. acquired the company for a total of approximately 200 billion yen (Micron acquired all shares for approximately 60 billion yen and made it a wholly owned subsidiary in July 2013. In addition, a contract manufacturing agreement worth 140 billion yen was concluded with Micron as its DRAM foundry)

(2) SBI Group's Contribution in the Financial Field





Strong fundraising functions and networks inside and outside enables the group to support stable and long-term fundraising

The "Fourth Megabank" Concept of the SBI Group



The "Fourth Megabank" Concept

Pursue the benefits of increased efficiency and expanded business scope through broad-based collaboration between the SBI Group and regional financial institutions nationwide, regardless of whether or not there is a capital relationship, and endeavor to create a broad-based regional platform with SBI Shinsei Bank at the core of the SBI Group

- Contribute to the sustainable development of each region through regional financial institutions -

- SBI Group has already formed alliances with more than 100 regional financial institutions throughout Japan through the promotion of this initiative
- Steadily expanding cooperation with regional financial institutions, especially in corporate lending, which is one of SBI Shinsei Bank's strengths

Through the promotion of this concept, the SBI Group will contribute to improve the revenue of regional financial institutions which will in turn contribute to the development of the regional economy (2) SBI Group's contribution in the financial field





SBI Investment's domestic and international investment performance

Investee Companies	Amount of investment	Amount of capital commitment
1156	JPY 545.9bn	JPY 711.7bn

Focusing on investments in privately held companies in the next generation of core industries such as AI, blockchain, fintech, IT, biotech/life sciences/healthcare, and green energy

(2) SBI Group's contribution in the financial field

Plan to Establish a New JPY 100bn Fund (SBI Digital Space Fund) By the End of This Fiscal Year to Invest in Companies With Cutting-Edge Services and Technologies in the Digital Space and Other Fields

	Digital space			
Web3	Fintech	Metaverse		
Web 2.0 Web 1.0 Web 1.0 Web 1.0 Web 2.0	Settlement Remittance Loans Investment KYC/AML			
NFT Traceability		VR/AR/MR Creator economy		
	Defi GameFi IEO/STO X-Fi	BMI Digital twin XR		
HealthCare	DX	Climate Tech		
PHR · Vital data · preventive medicine · remote medical care Image: Constraint of the second secon	Al/ bigdata IoT 5G/cloud			
DTx · Al drug discovery · Genome editing · regenerative medicine	Robotics Logistics · X-Tech	Green energy CCS · CCUS		
	SMB	Bio-fuel Smart grid		
	SaaS	EV · battery Micro-mobility		

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(3) The Japanese Government focuses on the semiconductor field as a national policy



Japan's Retreat as Seen in Changes in Per Capita Nominal GDP Rankings of OECD Countries

	1992	2012		2022			
1	Switzerland	Luxembourg		Luxembourg			
2	Luxembourg		Norway		Norway		
3	Sweden		Switzerland Ireland		Ireland		
4	Japan		Australia		Switzerland		
5	Norway		Denmark		United States		
6	Denmark		Sweden		Iceland		
7	Iceland		Canada		Denmark		
8	Germany	United States		Australia			
9	United States	Netherlands			Netherlands		
10	Australia	Japan			Sweden		
11	France		Ireland		Canada		
12	Netherlands		Austria		Israel		
13	Italy	Finland			Austria		
14	Belgium	Iceland			Finland		
15	Finland	Belgium			Belgium		
:		:			÷		
21	Israel	Israel		Japan			

()Reference) IMF World Economic Outlook Database

(3) The Japanese Government focuses on the semiconductor field as a national policy

Revival of the Manufacturing Industry and Regional Development are Essential to Revitalize the Japanese Economy

"Two years after the Strategy for Semiconductors and the Digital Industry established in June 2021, the global landscape has changed dramatically. <u>Economic security risks</u> and the <u>need to address digitalization and greening</u> have <u>become much greater and more realistic challenges</u>." "The new digital society is a great opportunity for the competitiveness of the <u>manufacturing industry</u>, including automobiles and robotics, and <u>it is a matter</u> of life and death to be left behind in this trend. In order to strengthen the competitiveness of user industries in the new digital society, it is essential to develop and secure a semiconductor digital industrial base in Japan that will serve as a source of added value."

Translated from Ministry of Economy, Trade and Industry: Commerce and Information Policy Bureau "Strategy for Semiconductors and the Digital Industry (Revised)" May 2023

Driver for revitalization of the Japanese Economy

Revitalization of the manufacturing industry

Industrial base for semiconductors



Regional revitalization

(3) The Japanese Government focuses on the semiconductor field as a national policy

The Japanese Government Has Positioned the Semiconductor Industry as a "National Industry" and Is Supporting the Promotion of the Industry on a National Level



Goal upheld by the Ministry of Economy, Trade and Industry

Achieve total sales of over JPY 15tn for domestic semiconductor manufacturers by 2030 and ensure stable supply of semiconductors in Japan

- Major national efforts related to semiconductors
- Granting a cumulative total of JPY 330bn to Rapidus, which seeks to manufacture nextgeneration semiconductors in Japan
- ✓ Approved up to JPY 476bn in subsidies for the construction of a plant in Kumamoto by Taiwan Semiconductor Manufacturing Company (TSMC)
- ✓ Subsidy of up to JPY 92.9 bn for the construction of KIOXIA Holdings' Yokkaichi plant
- ✓ Prime Minister Kishida met with executives of seven major semiconductor companies from the U.S., Europe, Taiwan, etc., and directly requested semiconductor investment in Japan ⇒ Micron Technology of the U.S. announced an investment of up to JPY 500bn
- ✓ Japan Investment Corporation (JIC), a sovereign wealth fund, acquires JSR, a major semiconductor materials company, for approx. JPY 1tn

The government plans to invest approx. JPY 2tn over the next two years in the development of domestic semiconductor manufacturing facilities and intends to invest a total of JPY 10tn over the next 10 years in both the public and private sectors

The Japanese Government Is Committed to Creating New Industries Under Its "Five-Year Startup Development Plan"



The government has positioned 2022 as the first year of startup creation and formulated the "Five-Year Startup Development Plan" at the end of 2022 with a view to a 10-fold increase in five years \Rightarrow Investment in startups in Japan has increased 2.3 times over the past five years (360 billion yen (2017) \rightarrow 820 billion yen (2021)), and the government and private sector will work together to achieve the goal of a 10 trillion yen increase by 2027, five years later, through the implementation of this plan

- Three pillars of the 5-year plan for startup development
- ① Build human resources and networks for startup creation
- ② Strengthening funding supply and diversifying exit strategies for startups
- **③** Promote open innovation

Create an ecosystem that <u>fosters startups in Japan by accelerating startups</u> and <u>promoting open innovation by existing large companies</u> (4) The market targeted by the new company that we will establish

Current situation surrounding the semiconductor industry in Japan Japan's share in the global semiconductor market was 50% in the past however, decreased to the current 10%



(Reference: Ministry of Economy, Trade and Industry "Strategy for Semiconductors and the Digital Industry")

The semiconductor market size is expected to surpass JPY 100tn in the next 10 years

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Technology Base Supporting the Development of the Semiconductor Industry



In 1965, Gordon Moore, one of the co-founders of Intel Corporation, the largest semiconductor company in the U.S., published an article in the magazine *Electronics* in which he predicted that "number of transistors on integrated circuits would double every two years"





If The Moore's Law is Coming to a Limit, now is Perfect Timing to Enter the Semiconductor Foundry Field

Enormous capital investment due to the sophistication of the technological base

Decrease in new entrants in the market

Decrease in competition

(4) The market targeted by the new company that we will establish

Competition in Semiconductor Technology Development has Bipolarized

- Miniaturization/high end vs Widening Gap/maturated



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10-20% of Total Semiconductors Produced are High-end (7nm and 10/14/16nm)



• In the medium to long term, the ratio of high-end products is expected to increase, but mid-range and mature semiconductors are expected to continue to be needed



Semiconductor production volume

Source: GLOBALNET CO., Ltd. "Semiconductor Production Line Worldwide Annual," SEMIWafer World Forecast, PSMC



Semiconductors of 28nm or more account for more than 90% of the total demand for automotive applications

(Example) Demand for automotive semiconductors



Source: Fuji Chimera Research Institute

PSMC, Taiwan's Leading Semiconductor Foundry, Share has Its Strengths in Semi-advanced Fields

- PSMC specializes in manufacturing <u>semiconductors suited to mature semi-advanced</u> <u>350nm~28nm logic processes</u> (and 20nm products in memory semiconductors) and has a relatively <u>high market share</u> in logic specialty semiconductors and memory semiconductors for niche markets
- In addition to two 200mm wafer fabs, <u>three large diameter 300mm wafer fabs are already in</u> <u>operation</u>, spanning logic and memory, and boasting mass production experience
- PSMC, together with TSMC, MediaTek, Etron Technologies, and others, provides financial support to open <u>the Graduate School of Advanced Technology</u> to foster advanced research personnel through industry-government-academia collaboration. PSMC dispatches lecturers too
 - < Examples of products in which PSMC has a relatively high market share >





(5) Building a robust ecosystem for the semiconductor industry in Japan by leveraging the strengths of Japan's semiconductor infrastructure



Strength in Japan ① Abundant demand in the electronic information industry market, especially automobile, biotechnology, and Al



Composition of the End-market for Semiconductors in 2022

- ✓ Final demand shows different trends for each product
- Memory (FLASH and DRAM) has a high weighting in computers and communications
- MCUs and power semiconductors have a high weighting in automobiles and industries



Different Growth Rates per Product Due to Variations in the Composition of the Final Market



Growth rate of each product in the semiconductor market

		Semiconductor Total	Power Transistors	CMOS Image Sensors	Analog	Power Management	MOS MPU	MOS MCU	MOS DRAM	NAND Flash Memory
	Jan	17.2%	17.0%	-22.8%	22.1%	19.3%	10.5%	22.5%	12.6%	15.0%
	Feb	29.0%	21.9%	-9.0%	33.9%	34.4%	11.8%	49.9%	42.9%	34.6%
	Mar	23.1%	9.2%	-1.7%	25.9%	26.3%	17.2%	36.1%	24.1%	25.8%
	Apr	12.0%	-7.0%	-17.1%	20.0%	18.0%	-12.7%	29.2%	1.2%	18.7%
	May	17.8%	15.7%	0.3%	25.1%	25.0%	-13.0%	36.1%	21.3%	16.0%
2022	Jun	6.2%	25.5%	-1.4%	31.7%	32.1%	-12.4%	41.0%	-26.4%	-12.7%
2022	Jul	-1.8%	25.4%	-0.5%	23.5%	24.3%	-12.1%	27.4%	-35.3%	-42.7%
	Aug	-4.8%	26.1%	13.6%	22.7%	19.4%	-17.9%	26.9%	-35.1%	-42.0%
	Sep	-2.5%	15.3%	8.2%	20.7%	15.6%	-18.5%	19.1%	-23.1%	-28.8%
	Oct	-6.3%	23.9%	19.8%	14.2%	17.9%	-20.3%	19.4%	-44.5%	-30.5%
	Nov	-17.8%	11.5%	-8.3%	4.0%	4.9%	-28.4%	18.9%	-53.7%	-51.1%
	Dec	-17.9%	15.6%	-0.8%	4.4%	-0.4%	-35.7%	14.2%	-45.5%	-49.6%
2022	Jan	-20.1%	14.3%	2.3%	-4.8%	-12.6%	-38.3%	21.9%	-59.3%	-61.8%
	Feb	-24.1%	27.7%	6.5%	-6.1%	-10.2%	-39.2%	19.9%	-66.0%	-64.0%
2025	Mar	-19.6%	23.7%	10.3%	-4.9%	-13.6%	-39.4%	12.3%	-51.3%	-43.3%
	Apr	-21.2%	38.4%	-2.0%	-7.5%	-17.1%	-24.7%	20.6%	-63.4%	-54.9%

(Source: Created by SBI SECURITIES based on WSTS)

High end Memory (DRAM, NAND) and MPUs are sluggish, but middle to mature Micro Controller Unit (MCU) and power transistors are strong

Application-Specific Semiconductor Demand Outlook SB by SBI SECURITIES

SBI SECURITIES forecasts that the end-market products driving the semiconductor market toward 2030 will be servers (data centers, AI),

automobiles, and industrial equipment (edge terminals/AI)

	2020	2021	2022	2030	
(Billion USD)				SBI Forecast	CAGR(2020-2030)
Smartphone	117	145	144	154	3%
Computer	100	125	115	95	-1%
Home Appliance	50	66	71	82	5%
Communication Infrastructure Equipment	38	45	53	59	5%
Servers	76	94	100	180	9%
Automobile	40	54	63	108	10%
Industrial equipment (IoT)	51	65	73	116	9%
% Composition Ratio					
Smartphone	25%	24%	23%	19%	
Computer	21%	21%	19%	12%	
Home Appliance	11%	11%	11%	10%	
Communication Infrastructure Equipment	8%	8%	9%	7%	
Servers	16%	16%	16%	23%	
Automobile	8%	9%	10%	14%	
Industrial Equipment (IoT)	11%	11%	12%	15%	

Source: Created by SBI SECURITIES based on company data

APPLICATION SPECIFIC ICS Shipment Trends



- Automobiles continue to increase by double digits -

APPLICATION SPECIFIC ICS shipments for consumer and wireless communications are expected to remain challenging from 2022 onward, while shipments for automotive will continue to increase by double digits YoY and those for computers and peripheral equipment will also improve





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(Source: Compiled by SBI SECURITIES from WSTS)

The Shift to EV has Begun in Earnest in Japan

EV Strategies of Major Automakers

ΤΟΥΟΤΑ	 Seeking to commercialize a next-generation battery called "full solid battery" in 2027 to improve EV performance "BEV Factory," a dedicated EV organization, has been established Targeting 1.5 million EV sales by 2025
Nissan	 Investing approximately JPY 2tn in EVs over the next five years to accelerate electrification Introducing 23 EV models by FY2030 and expand the global model mix of EV to more than 50% All fixed batteries will be brought to market in FY2028
Honda	The plan is to develop 30 EV models globally by 2030, with annual production exceeding 2 million units
Suzuki	 Targeting 20% of battery EVs in Japan, 80% in Europe, and 15% in India by 2030

By 2030, companies are expected to enter the EV business in earnest, which will further increase the demand for semiconductors

Significant Growth Opportunities in Non-Memory Semiconductors in Automotive and Industrial Machinery



Semiconductors to be installed in a car: Increasing demand is expected for semiconductors produced in mid-range, mature processes, such as power, analog, and MUC

Semiconductors for industrial equipment: Increasing demand is expected for microcontrollers and Al chips produced with mid-range processes



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(Source: Compiled by SBI Securities based on data from the Ministry of

SBI

In the Long Term, the Semiconductor Industry Is Expected to Grow at a High Rate Due to the Megatrends, Such as AI, DX, and GX



Strength in Japan ② In the Semiconductor Manufacturing Equipment Market, Japan has a Large Share in the Equipment and Material Fields

GROUP

- Semiconductor production involves more than 1,000 processes in total, and extremely high cleanliness is required for the production
- in the situation where advanced and sophisticated technology is required, Japan has become an integral part of the semiconductor manufacturing supply chain, with Japan holding a 30% share of the semiconductor manufacturing equipment industry following the U.S., and Japanese companies holding approximately 50% of the share for key semiconductor component materials

Country Share for Semiconductor Manufacturing Equipment



Component Materials

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(5) Building a semiconductor ecosystem in Japan

Some Japanese Companies Have a Large Share of SBI Semiconductor Manufacturing Equipment Global Semiconductor Manufacturing Equipment Market (2021)



(Exhibit: Prepared by SBIH based on data from METI's "Semiconductor and Digital Industry Strategy", Global Net's "Global Semiconductor Manufacturing Equipment and Testing/Inspection Equipment Market Yearbook 2022") [Unauthorized reproduction is prohibited]



Development of Horizontal Division of Labor in the Semiconductor Industry

- Since the 1990s, while specialized companies such as foundries and OSATs have emerged for each process and the horizontal division of labor has progressed, Japanese semiconductor manufacturers stuck to the vertical integration (IDM model) and missed the trend
- ✓ Since the 2010s, the number of Japanese companies such as Renesas Electronics, Socionext, and ROHM have been increasing to utilize the foundries instead of being self-sufficient



(6) SBI Group Will "Go Beyond Finance with Finance as its Core"



(One of the SBI Groups' basic business principles)

Advantages for the financial industry to expand into other industries



The SBI Group Contribute to the Recovery of Japan's Semiconductor Industry by Providing Financial Functions and Maximizing the Use of its Corporate Ecosystem



SBI group will go beyond finance with finance as its core

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