



**NPC incorporated**

# **Business Plan and Potential for Growth**


**December 2022**

**NPC Incorporated  
(TSE:6255)**

1. Business Model
2. Market Environment
3. Competitiveness
4. Business Plan
5. Risk Information

## Company Policy

We, through creation of products,  
aim to be a company needed by nature, society, and people.

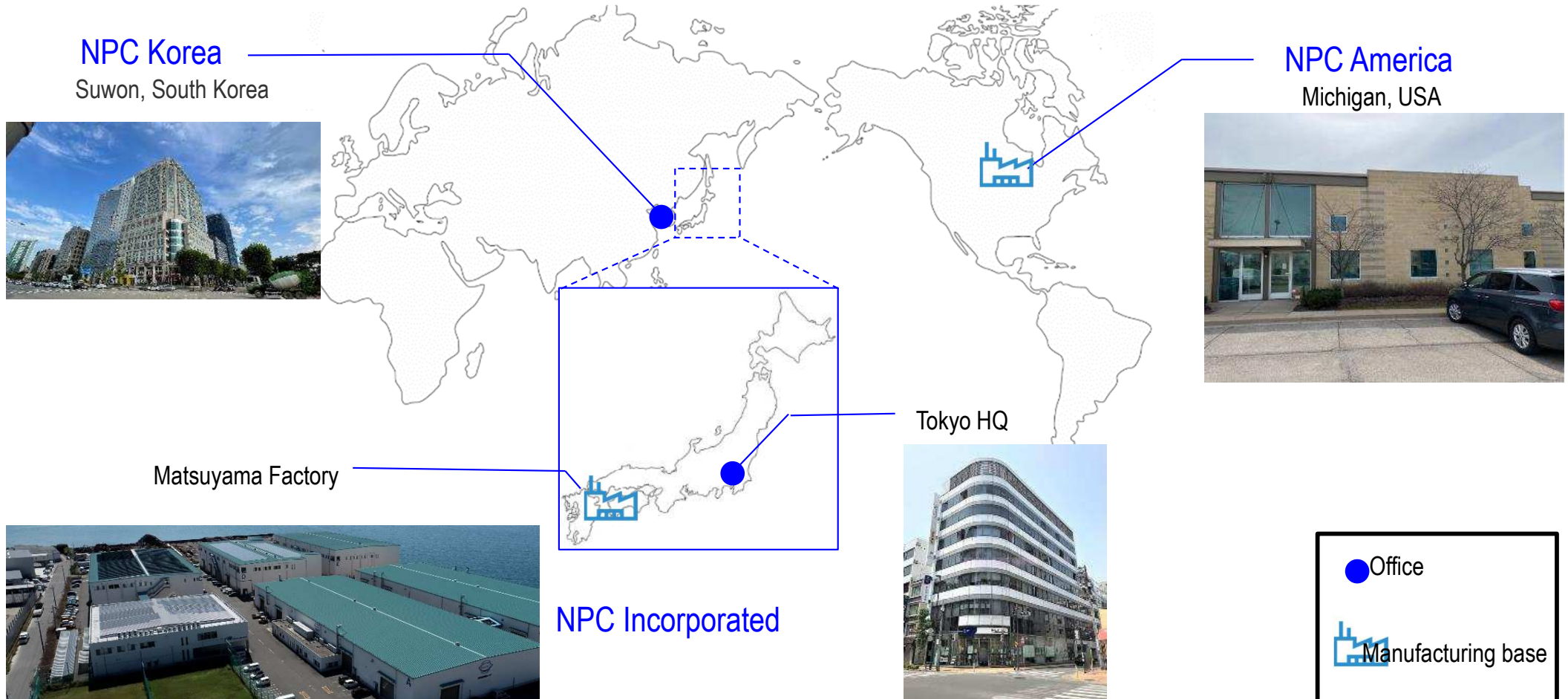


Matsuyama  
Factory

Company Name	: NPC Incorporated
Establishment	: December 1992
Activity Bases	: Tokyo Headquarters/ 1-7-15 Higashi-ueno, Taito-ku, Tokyo Matsuyama Factory/ 2889 Nishihabu-machi, Matsuyama-shi, Ehime
Capital	: 2,812 million yen (as of August 2022)
Employee	: 163 (consolidated) (as of August 2022)
Fiscal year end	: August 31
Stock Market	: TSE Growth
Stock code	: 6255

# Group Network

Name	Function	Employee
NPC Incorporated	Sales, Procurement, R&D, Design, Manufacturing, O&M	161
NPC America Automation Inc. (consolidated subsidiary)	Sales, Design, Manufacturing, O&M	2
NPC Korea Co., Ltd. (non-consolidated subsidiary)	Sales, Procurement	1



## Machinery Business

■ PV module manufacturing equipment



■ Automation machines



■ Vacuum related equipment



## Environmental Business

■ Inspection service for solar power plants



■ Reuse/recycling of PV panels



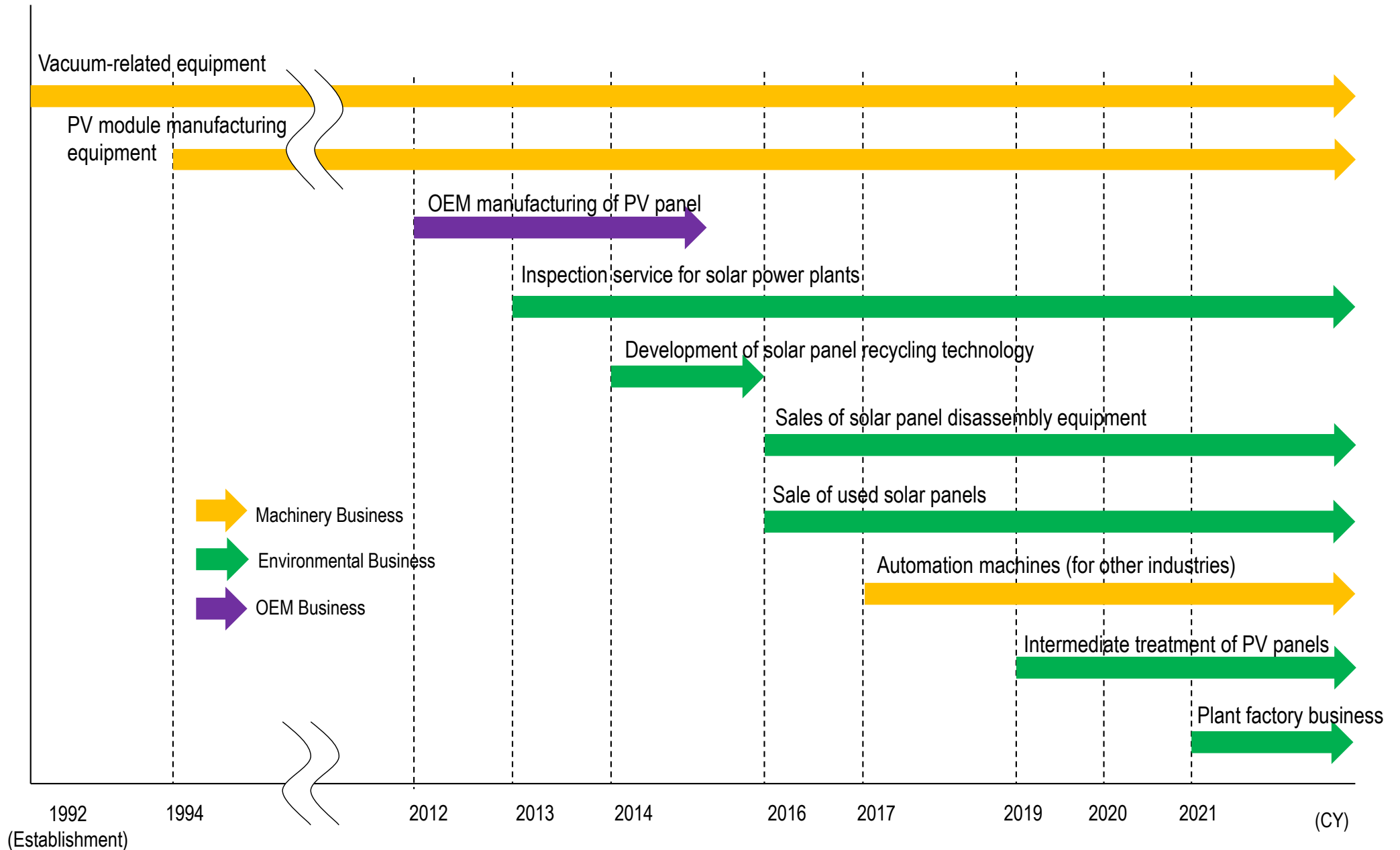
■ PV panel disassembly equipment



■ Plant factory business



# History of Business Expansion



# Target of Each Business

## NPC Incorporated



Manufacturing of equipment



Solar panel recycling



Plant factory

PV module manufacturing equipment



Automation machines,  
Vacuum-related machines



Solar panel disassembly equipment



Inspection service for solar power plants



Collection and reuse sale of used  
solar panes



Glass, aluminum, copper wire, etc.

## Companies

PV module manufacturers

Electronic parts companies  
Automobile-related  
companies  
Display-related companies  
Food companies

Waste management  
companies

solar power plants  
EPC  
Constructors

Recycling companies

## General consumers (within Ehime pref.)

(Retail business)  
Supermarkets  
Delicatessens

(Food service)  
Restaurants  
Hotels

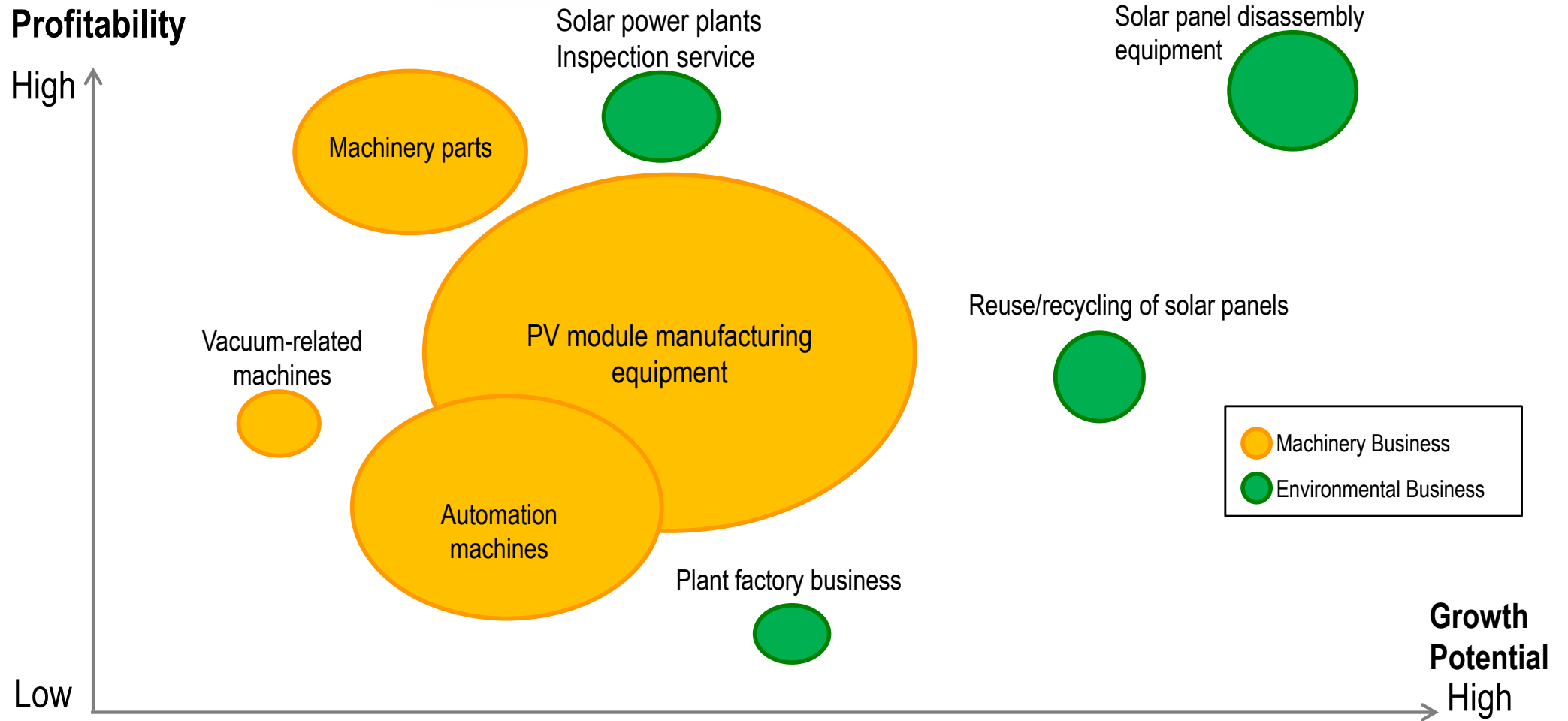
Food processing  
companies



Vegetables

← Machinery Business  
← Environmental Business

# Business scale, growth potential, and profitability of our products and services

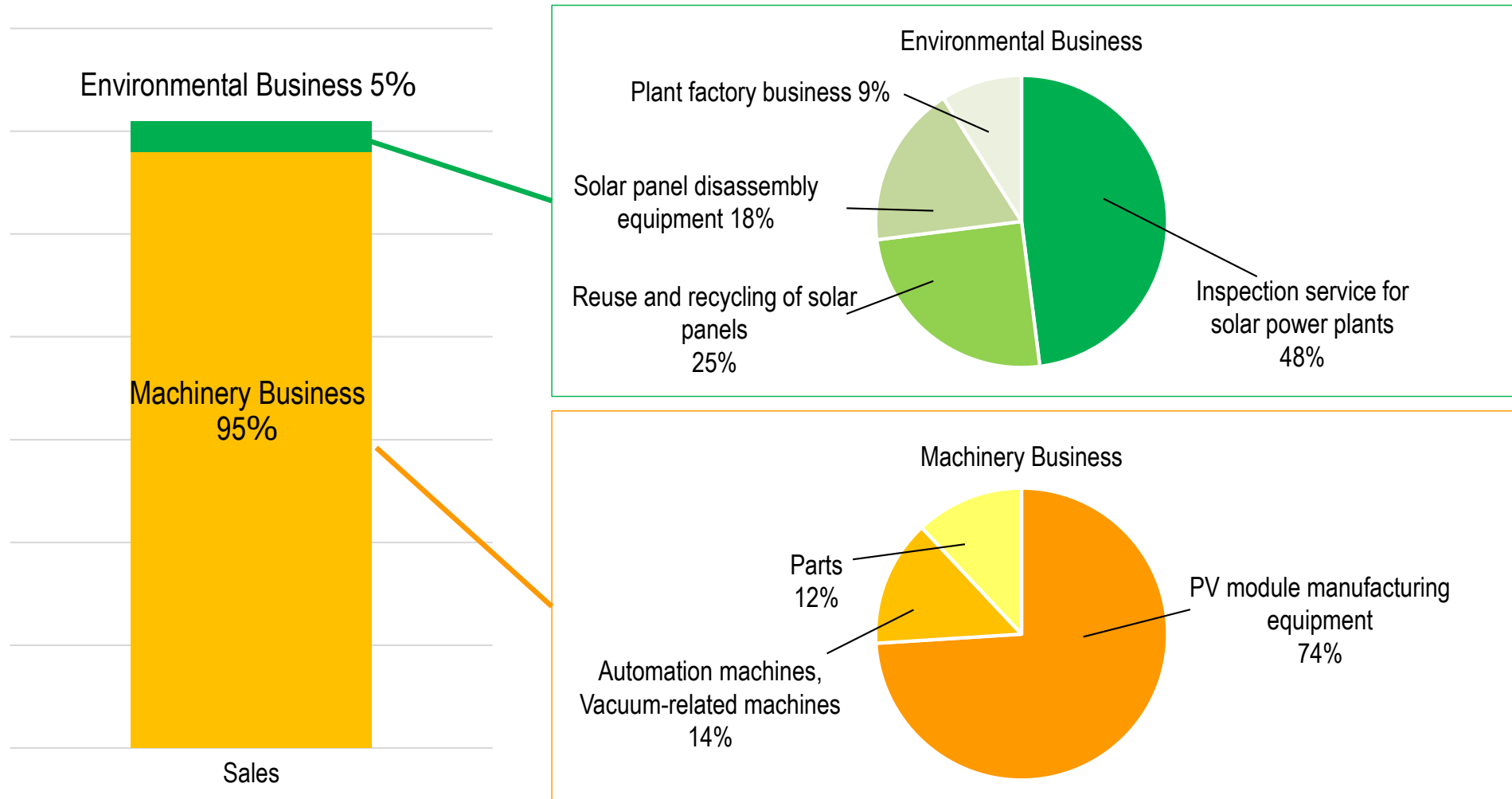


- The weighted average gross profit margin for past 5 years: 25.6% for the Machinery Business and 32.3% for the Environmental Business.
- PV module manufacturing equipment is relatively profitable in the Machinery Business as we can take advantage of our 25 years' experience in the industry. PV module manufacturing equipment business consists of new equipment and upgrading & expansion of existing equipment. Profitability of upgrading & expansion is higher than new equipment as they are implemented on our own equipment installed in customers' facilities. Automation machines business is less profitable than other business as there are many competitors.
- In the Environmental Business, solar panel disassembly machine has high profit margin as it is equipped with our proprietary technology. Solar panel inspection service also has a high profit margin due to our original technology for detailed inspections.
- The overall gross profit margin for each fiscal year fluctuates depending on the sales mix.



# Sales Composition and Profitability of Each Segment

Sales breakdown of past 2 years

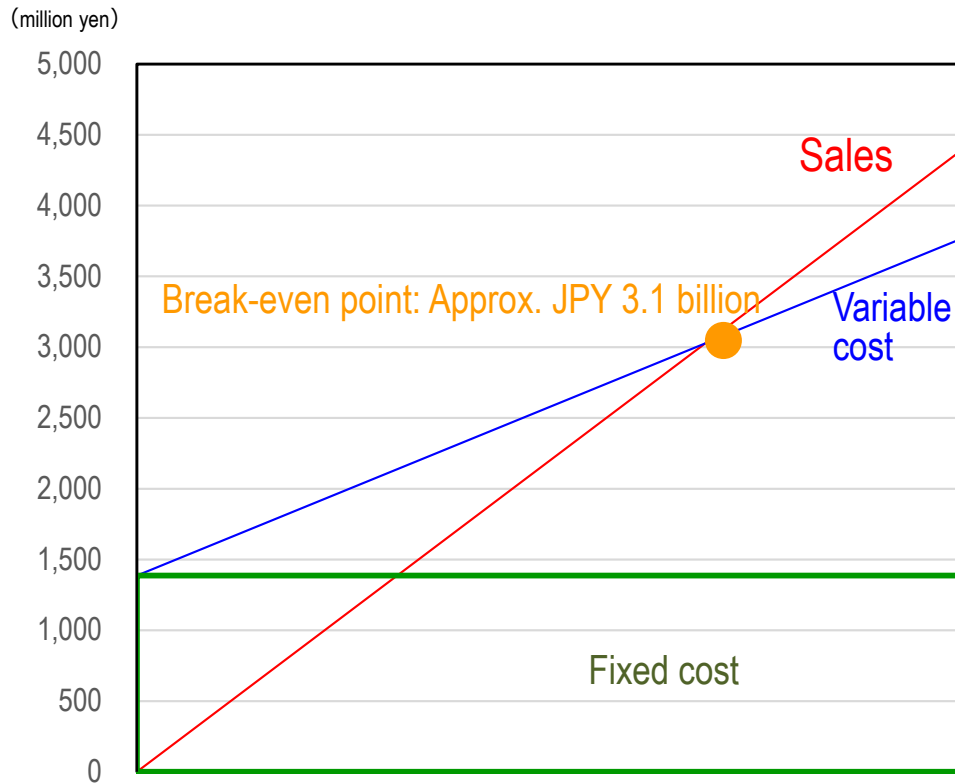


**【Notes】**

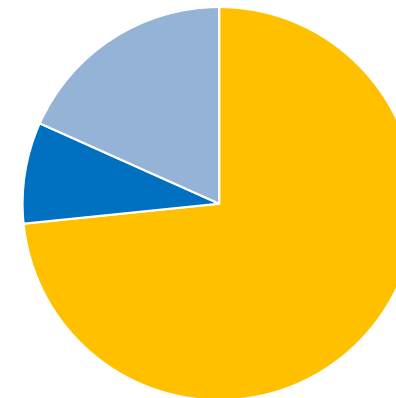
- The numbers related to sales in the above graphs are based on the accumulated sales amount from FY2021 to FY2022 (JPY 12,200 million).

# Profitability and sales cost structure (FY2021 data)

## Break-even point graph



## Break down of manufacturing cost



Material cost	73%
Labor cost	8%
Expenses	18%

### 【Notes】

- The above data are calculated from consolidated results for FY2022 that include all products and services.
- Marginal profit ratio: Approx. 45%

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## PV module manufacturing equipment (1)

PV modules to which our manufacturing equipment is targeted

Next-generation PV modules  
such as perovskite

Thin-film modules

Crystalline modules

Thin-film modules



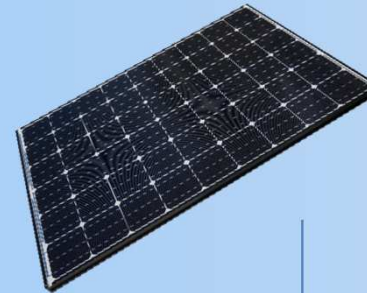
Building-integrated modules



Module for satellites



General crystalline modules



We offer custom-made high-end manufacturing equipment, which is required to manufacture thin film modules and special-purpose crystalline modules (such as BIPV modules and satellite solar modules). As an equipment manufacturer in this field, we have no specific competitor.

Our main customers are PV module manufacturers in the US and Japan. Among other companies, we have done business with our largest customer, US-based First Solar (listed on NASDAQ), for nearly 20 years.

We also target next-generation PV modules such as perovskite PV. Perovskite stands for a name of a crystal structure. Using this structure, PV modules can be manufactured with coating technology at low-cost. As this technology enables soft and light-weight PV modules which can be installed where crystalline modules cannot be installed, it is regarded as a key technology in energy transition. Researches are underway for mass production.

Crystalline modules account for approximately 90% of PV module market.

They are used for purposes such as mega solar power plants or general in-house power generation and mainly manufactured by Chinese and Korean PV module manufacturers.

In addition, the manufacturing process for general panels is standardized and Chinese equipment manufacturers provide manufacturing equipment. We do not offer manufacturing equipment for these modules.

# Machinery Business

## PV module manufacturing equipment (2)

### US PV Market

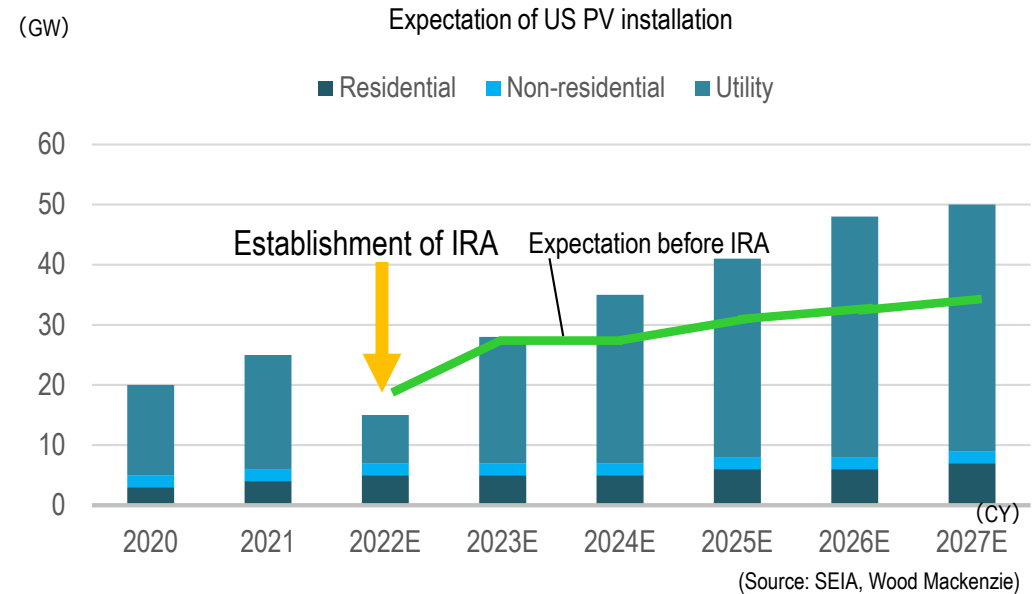
US PV market is the second largest in the world

Inflation Reduction Act (IRA) was signed into law in August 2022

- Invests USD 370 billion in anti-climate change measure for next 10 years.
- Supports domestic PV-related manufacturing for independence of PV supply chain.

#### After the establishment of IRA

- Estimation of US PV market growth improved by 40%.
- High growth is expected for mid to long term. (See the right graph)
- PV installation is expected to accelerate due to PV Investment Tax Credit.
- Capital expenditure has become active at US PV manufacturers such as First Solar as the law includes Manufacturing Tax Credit.



### US major customer

First Solar:

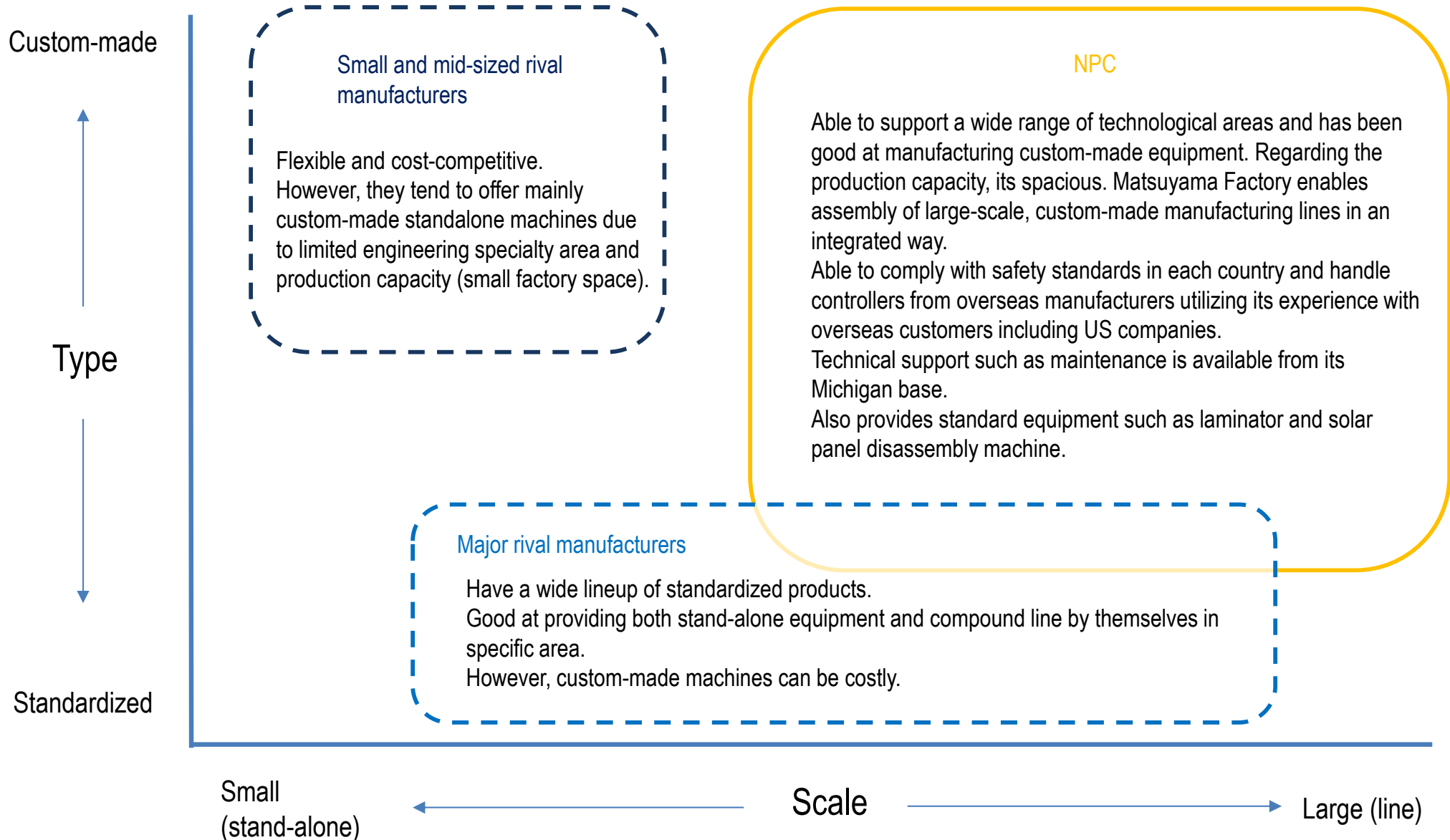
- No. 8 shipment in the world (2021)
- (No. 1 production & shipment as a thin-film PV manufacturer)
- Strong order backed by the trend of avoiding PV modules made by Chinese manufacturers the US.
  - Building 2 new factories in addition to existing 5 manufacturing lines.
  - Announced expansion of existing US factory and establishment of 1 new factory.
  - Continuous capital expenditure is expected in response to strong demand.
- NPC has installed its equipment in the existing 5 lines and 2 new factories.
  - Receiving orders for factory expansion and the new factory.

Production capacity and expansion plan of First Solar (as of November 2022)

	Operation	Capacity (GW)	Location
Existing	In operation	9.5	Ohio, USA (2 lines) Malaysia Vietnam (2 lines)
New	2023	3.3	Ohio, USA
New	2023	3.3	India
Expansion	2024	0.9	Ohio, USA
New	2025	3.5	Alabama, USA


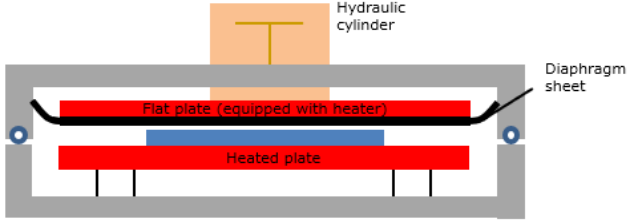

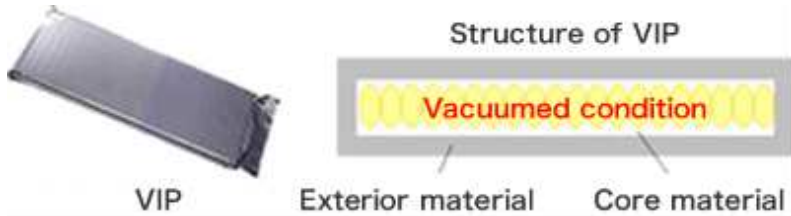
## Automation Machines, Vacuum-related equipment (1)

Strong area of Japanese rival manufacturers and NPC



## Automation Machines, Vacuum-related equipment (2)

### Lineups of vacuum-related equipment

<p>Vacuum laminator</p> 	<p>Equipped with an original laminating technology that combines diaphragm and flat plate press technology</p> 	<p>Application -PV module -Electric parts -Laminated glass etc.</p>
<p>VIP sealing machine</p> 	<p>The vacuum insulation panel (VIP) is applied to energy saving refrigerators and vending machines, helping to reduce environmental load. Research on using the material for buildings is progressing.</p> 	<p>Application -VIP sealing</p>

-Vacuum-related machines are used for product development as they have wide application such as layering, laminating, sealing, and forming.  
There are some manufacturers in Japan and overseas that manufacture similar products.  
-Easy to secure profits as it is standard products with NPC's core technology.

# Environmental Business

## Inspection Service of Solar Power Plants(1)

Statutory inspection

- Visual check
- Ground resistance measurement
- Ground continuity test
- Insulation resistance measurement
- Dielectric strength test



Voluntary inspection/services

High cost →

Service for quality improvement



Weeding

Simplified test (fault detection)



Panel cleansing

Precise inspection (fault identification)



Drone IR inspection



I-V characteristic inspection



EL inspection

Number of competitors

Numerous (small and mid-sized electric companies and local engineering firms, etc.)

Few

Very few

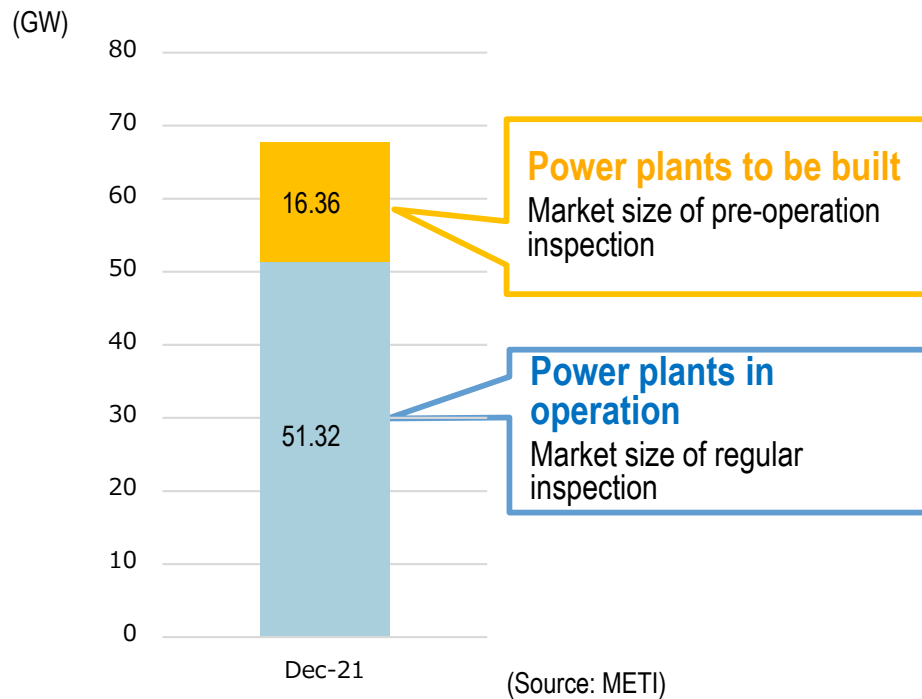
NPC's service coverage

- Although inspection service mainly targets legal inspection for large-scale solar power plants, there is a wide range of voluntary inspection menu. NPC can provide not only legal inspection service, but also various voluntary inspection service. Especially, it has various original technologies for precise inspection; Technology that speeds up I-V inspection (patented) and Technology that realizes the same EL inspection performed before shipment of solar panel in outdoor environment.
- Although many competitors offer statutory inspections and simple inspections, we can inspect power plants across Japan with the same quality through our nationwide inspection network, Solar Wellness. We also provide customers with a report that contains our proprietary expertise after inspection to differentiate us from our competitors.
- Market of inspection service for solar systems other than large-scale power plants is expected to expand due to increase of self-consumption solar systems and PPAs.

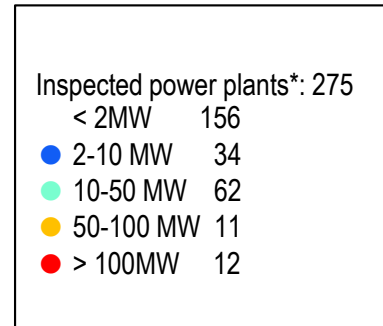


## Inspection service for solar power plants (2)

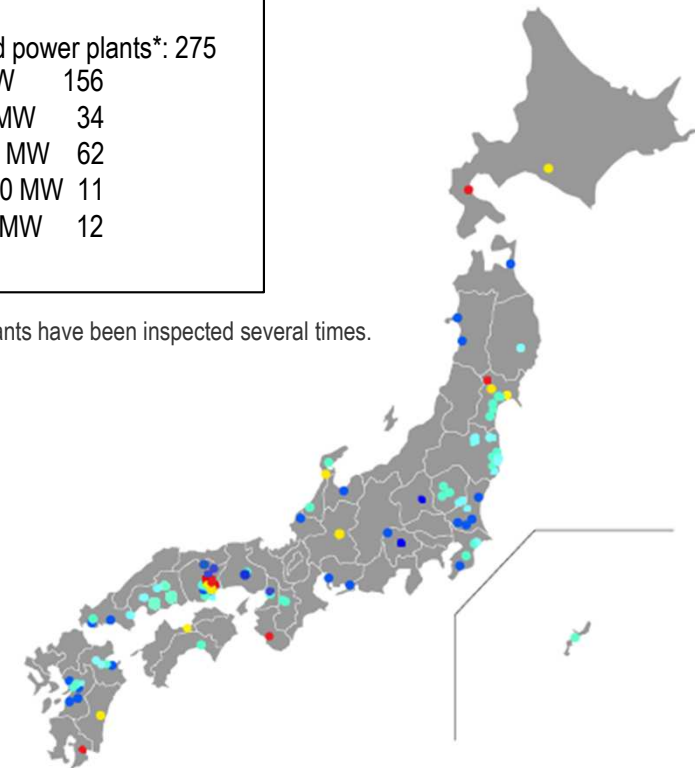
### Power plants approved under FIT in Japan



### Inspection achievement (as of November 2022)



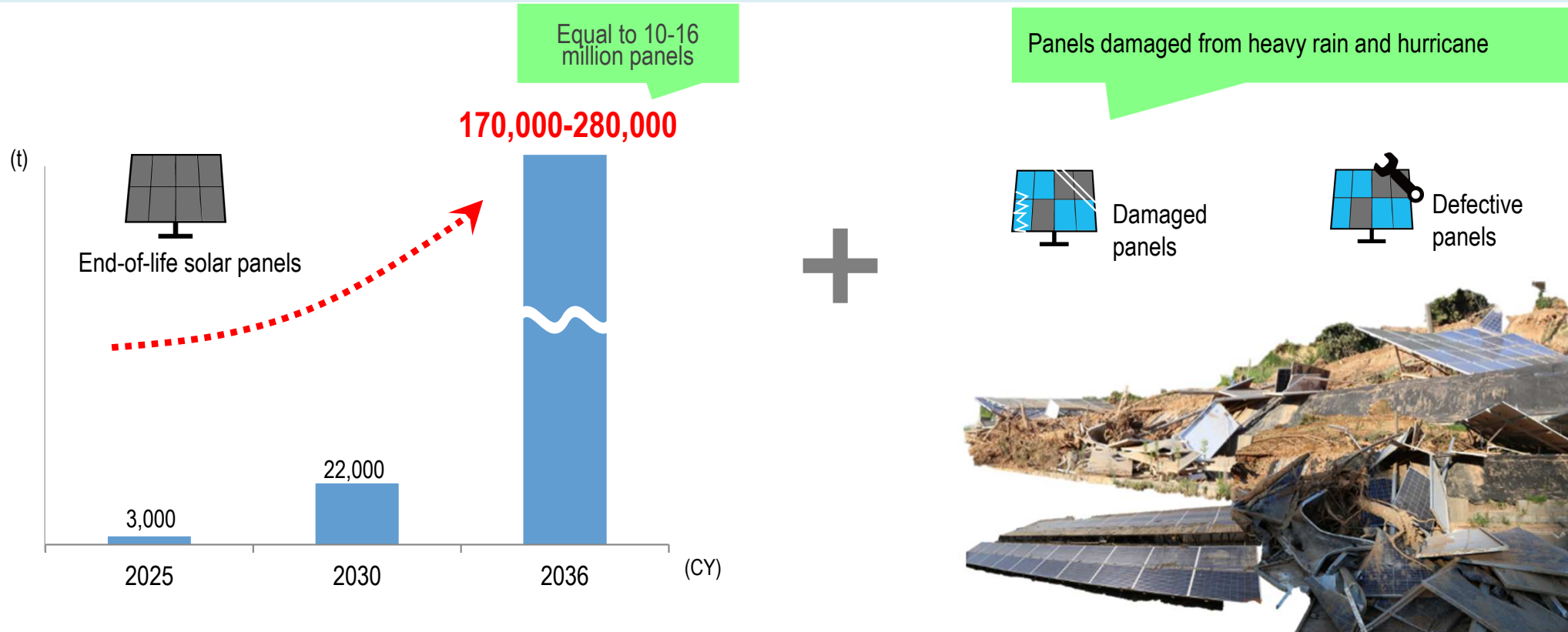
\* Some power plants have been inspected several times.



- FIT (feed-in tariff) is a system to purchase electricity at fixed prices that began in Japan in 2012, under which utility solar power plants are being installed for the purposes of selling electricity. Many power plants have been approved by the Ministry of Economy, Trade and Industry but have not started operation yet. They are expected to be installed sequentially over the coming years. When these plants are installed, many different voluntary inspections may be conducted as pre-operation inspections in addition to statutory inspections.
- The size of regular inspection market is proportional to the total number of power plants that have started operation. In the future, the total number of plants installed through FIT projects will continue to increase. In addition, the demand for in-house consumption of solar power is expanding as a new market, resulting in an increase in solar power systems installed at factories, public facilities and other locations. The scope of statutory inspections is also expected to expand and apply to small-scale solar power systems in the future. This means that the size of regular inspection market will continue to expand.

## Reuse and Recycling of Solar Panels (Disassembly Service)

Estimation of the number of panels to be discarded in Japan



(Source: *Disposal of Solar Power-Generating Facilities*, Agency for Natural Resources and Energy, November 21, 2018)

Panels damaged by a disaster in 2018 Photo by PVeye

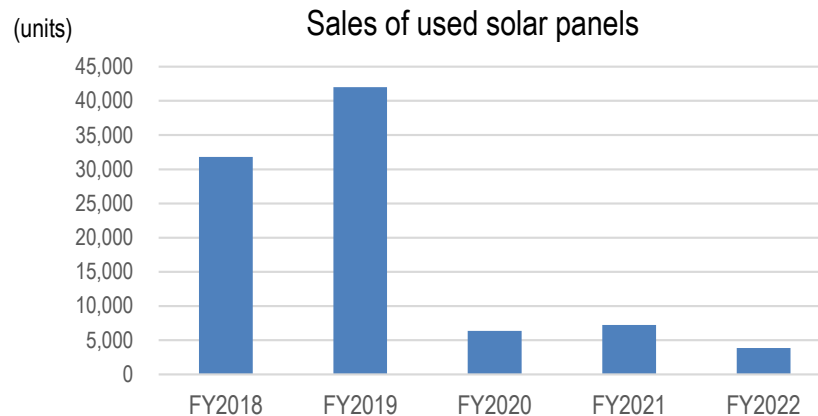
-The figure on the left shows the estimation made by the Ministry of Economy, Trade and Industry (Agency for Natural Resources and Energy). For this estimation, only the panels to be discarded after the 20-year purchase period in FIT projects on lease land are counted. In Japan, the number of discarded panels is expected to rapidly increase after around 2030 when FIT starts to expire.

-The figure on the left does not include panels damaged by disasters and defective panels. Therefore, in reality, a large number of panels can actually be discarded at an earlier date.

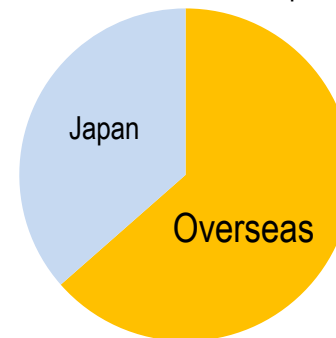
# Environmental Business

## Solar Panel Reuse

### Demand trends and past results of reused solar panels



Destinations of reused panels

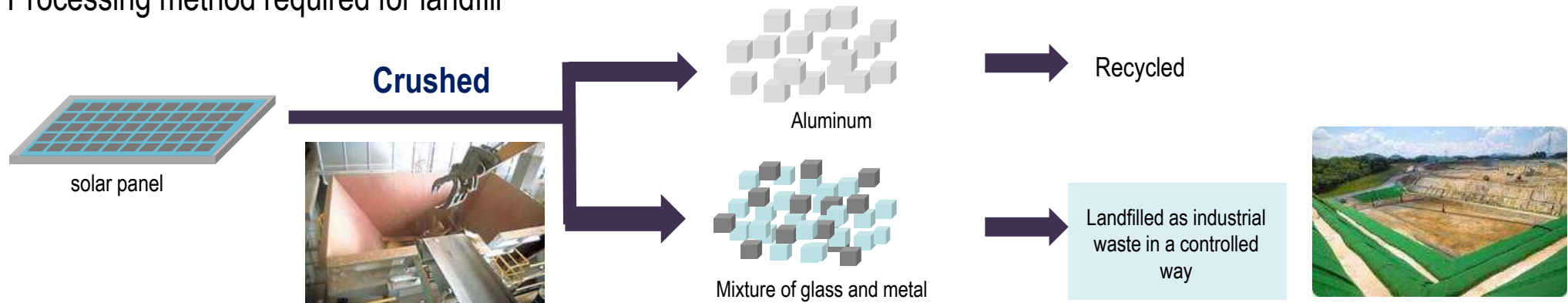


- Our advantages over competitors are as follows.
  - (1) Best cost deals (minimum safety inspection, no warranty in principle, and direct distribution)
  - (2) Reliability based on deep insights on and experience with solar panels (We have not dealt in low-quality panels.)
  - (3) Network in the industry built through inspection services for solar power plants (about 1,000 companies)
- Of the needs of sellers, most replaced solar panels and unused solar panels in stock were collected by around 2019. Although solar panels submerged or otherwise damaged by disasters are now primarily sold, there are currently not many solar panels damaged by disasters. To obtain solar panels damaged by disasters, we work with insurance companies and signed an agreement with Shikoku Electrical Safety Inspection Association to quickly acquire information.

# Environmental Business

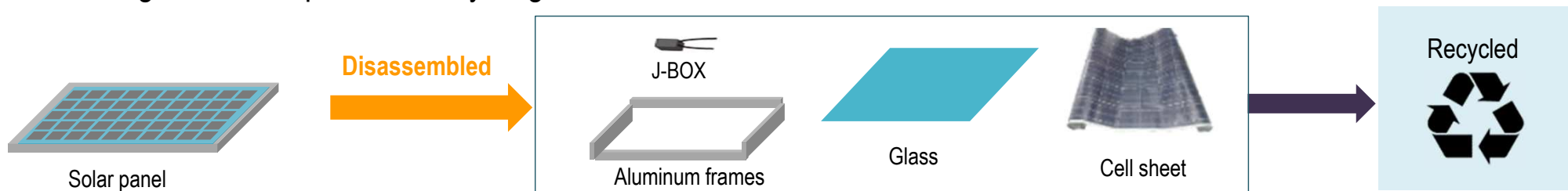
## Solar Panel Recycling (Disassembly of Solar Panels)

### ■ Processing method required for landfill



Solar panels have a robust structure focused on durability and sealability and are difficult to disassemble. In particular, the glass part and the metal part are laminated using resin (EVA) and very difficult to separate. Therefore, solar panels are crushed with a shredder, which generates a mixture of glass and metal. As a result, most parts are unrecyclable and landfilled in many cases though some materials such as aluminum used in the frame are recycled. Because hazardous substances such as lead are used in the solar panel manufacturing process, they must be landfilled at a controlled final disposal site. This leads to landfill facilities running out of space in the future, a large environmental impact and high costs.

### ■ Processing method required for recycling



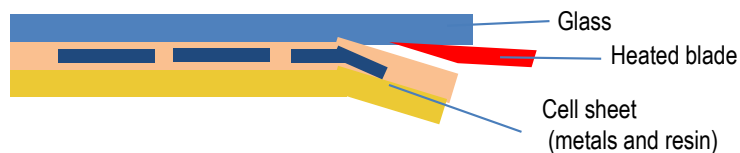
Glass accounts for a large part of the panel weight. Other components such as aluminum frames, silicon cells and copper wires contain metals. Because glass and metals are processed and recycled in different ways, it is important to first separate glass and metals to recycle solar panels. Collected glass can be reused, for example, as civil engineering material or sandbags. Collected metals are recycled at refineries and other facilities. At NPC, we automatically remove the J-BOX and aluminum frames from the solar panel and separate the part of glass and cell sheet laminated with resin using our original method called "heated blade separation method".

# Environmental Business

## Solar Panel Recycling/Disassembly Equipment

### Examples of recycling methods

Method	Processing method and other details	Main equipment manufacturers
<b>Heated blade separation method</b>	Method to separate glass and cell sheet, which contains silicon and other metals, using a blade heated to about 300°C. Glass is collected as sheet glass.	<b>NPC Incorporated</b>
Crushing	Method to physically crush solar panel glass using a tool such as hammer or roller and remove the glass part.	Kankyo Hozen Service Co., Ltd., Tiger-Chiyoda Machinery Co., Ltd., Kinki Industrial Co., Ltd., and Donico Inter Co., Ltd.
Blasting	Method to fix the solar panel, spray abrasive to crush glass, and scrape it away.	Mirai Sozo K.K.
Heat treatment	Method to put the solar panel in the furnace, pyrolyze the sealer (resin) at a high temperature of several hundred degrees and remove glass and metal.	Shinryo Corporation and Niimi Solar Company



Glass



Glass from broken solar panel



Cell sheet

(Source: Research by NPC)

### Features and advantages of the heated blade separation method

- NPC proprietary treatment method. We have obtained four related patents and do not have any competitors.
- Rapid treatment speed and high treatment capacity (solar panel is processed in 60 seconds)
- High recyclability realized by separation of glass and metals (recycling rate is 96.9% as of December 2021)
- High treatment capacity and high recyclability mean low processing costs and a large environmental impact reduction effect.
- From solar panels with unbroken glass, glass can be collected as sheet glass and metals do not mix in.
- Solar panels with broken glass can be processed as well.

# Environmental Business

## Solar panel disassembly equipment

Achievement and estimation in Japan and overseas (as of November 2022)



Automated line



★● Results

★○ Estimation

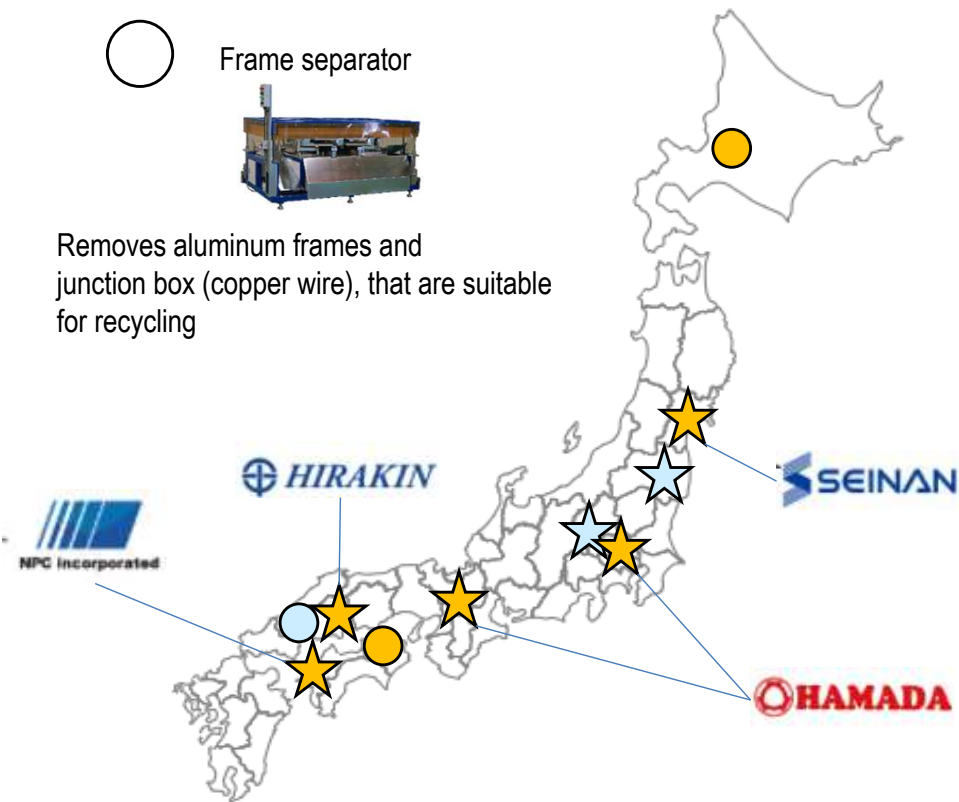
A fully-automated line that contains glass separator, equipped with the Heated Blade Separation Method



Frame separator



Removes aluminum frames and junction box (copper wire), that are suitable for recycling



Japan	<ul style="list-style-type: none"> <li>-Although not many panels are currently discarded, there are increasing number of companies that want to take the lead before the market takes shape or consider introducing disassembly equipment as sustainable efforts.</li> <li>-It may take some time to obtain the disassembly service license in some municipalities.</li> <li>-Many customers consider using subsidies to deploy equipment.</li> </ul>
Overseas	<ul style="list-style-type: none"> <li>-In Europe, disassembly equipment is much needed because recycling is mandatory, and an increasing number of solar panels are discarded after FIT expires.</li> <li>-The high recyclability of our heated blade separation method is highly rated in Europe where recycling awareness is particularly high.</li> <li>-There are increasing needs in USA, Australia, etc.</li> </ul>

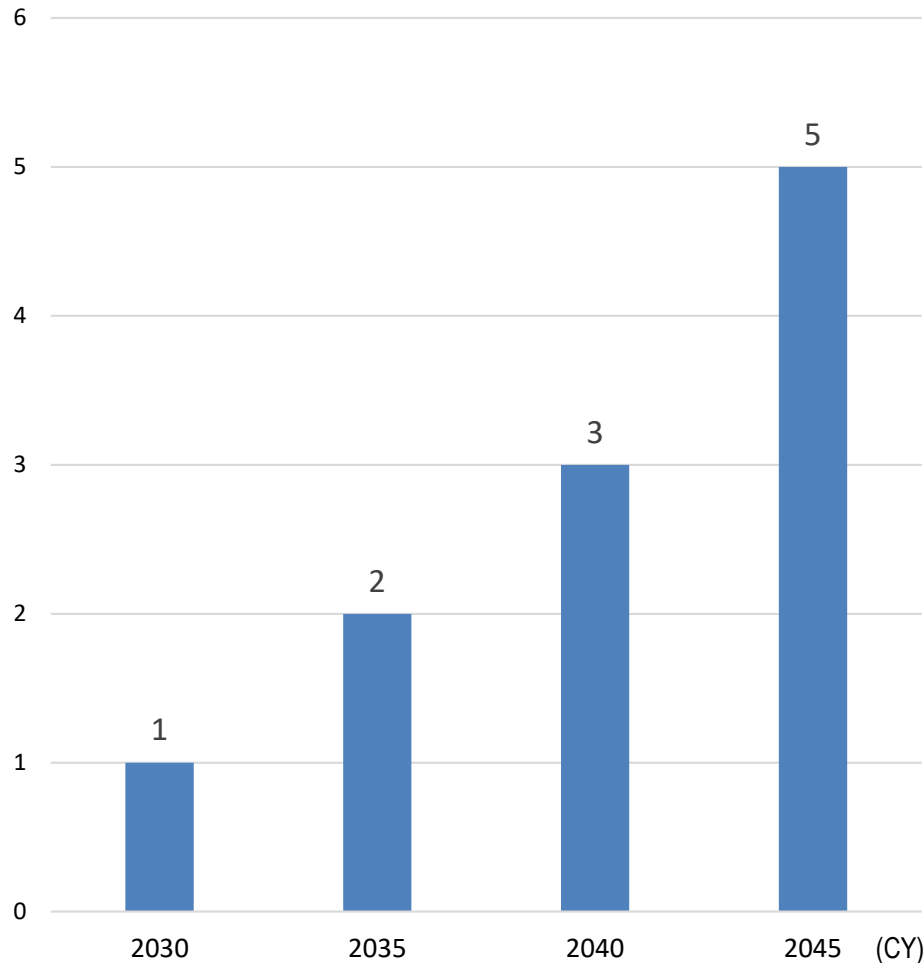
# Environmental Business

## Solar panel disassembly equipment

### Market

-Estimation of global waste solar panel volume (for each year)

(Million tons)



(NPC prepared based on "Status-of-PV-Module-Recycling", IEA PVSP, 2022)

-Capacity of an automated solar panel disassembly line

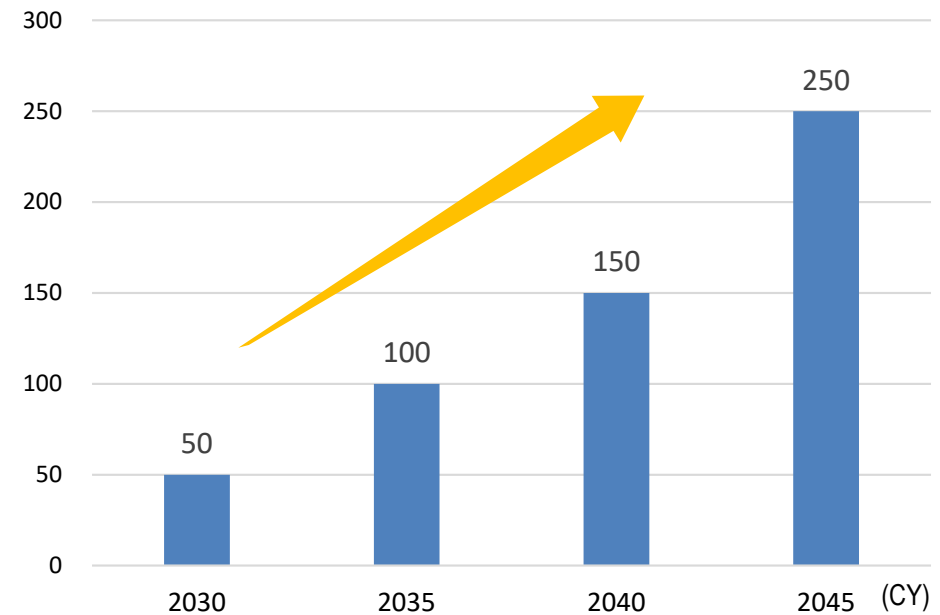
144 thousand panels per year  
 (8 hours x 300 days)  
 = 2,500t per year



Lines required based on the of global waste solar panel volume

(On the assumption that 50% of end-of-life panel were collected and NPC market share was 25% of share)

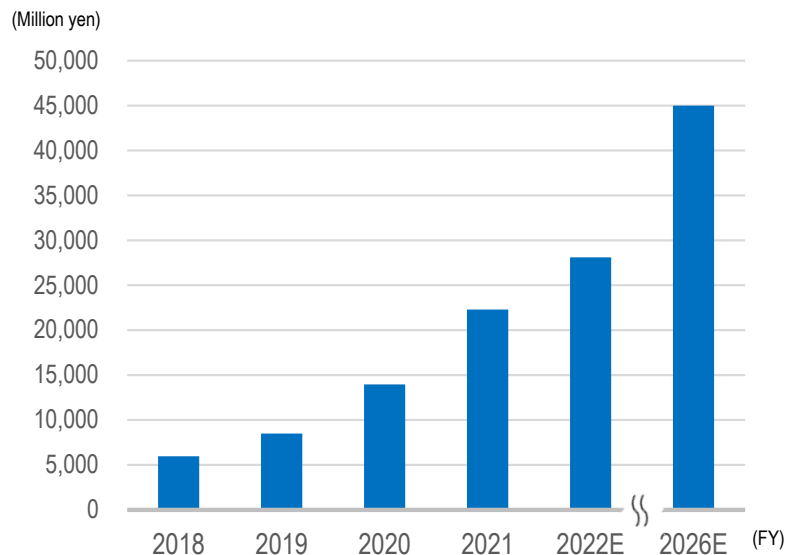
(Lines)



# Environmental Business

## Plant factory business

### Scale of the plant factory market

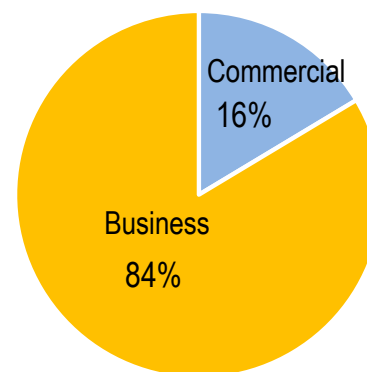


There are stable needs throughout the year for vegetables grown in plant factories. In plant factories, lettuces are mainly grown as they require less light, and they are easy to grow. Meanwhile, cultivation of vegetables with higher added value and popularity such as strawberries and spinach is considered.

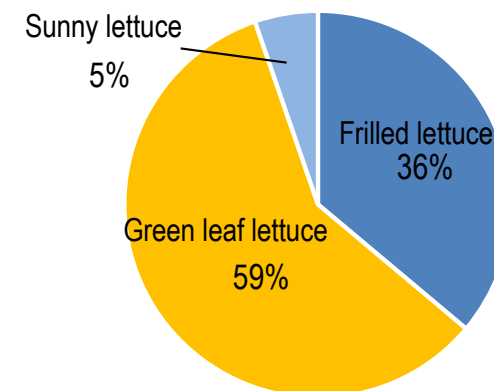
(Source: *The Now and Future of the Plant Factory Market*, Yano Research Institute Ltd., August 2022/06)

### Sales performance

#### By purpose



#### By item



We installed facilities in building D in the existing factory, reducing depreciation costs.

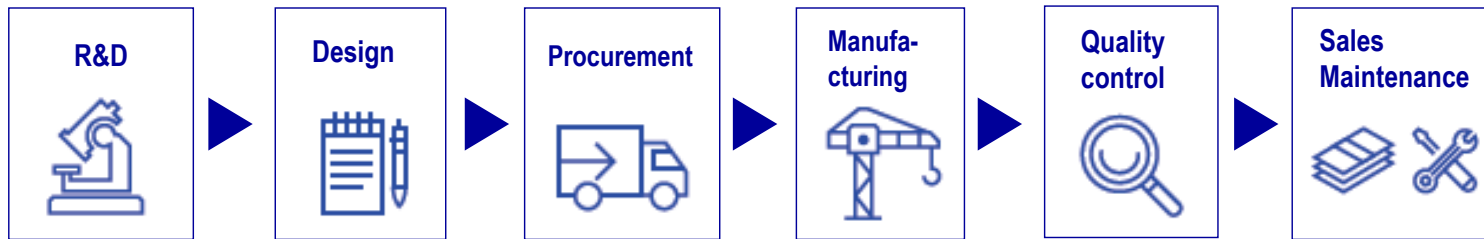
- Plant factories are powered through in-house solar power generation using the rooftop solar power system to reduce utility costs and achieve clean energy production. We employ reused solar panels in the solar power system, establishing a recycling business model.
- As the plant factory market is expanding due to the demand for safe and secure vegetables, we mainly address local needs in Ehime Prefecture. As of the end of FY2022, we achieved full production of 1,100 kg/week and almost all the products have been sold out. The high quality of our lettuce is highly rated as Hakohime brand and sold for commercial use to regular customers. We have also sold this product for consumer use at supermarkets and grocery stores.
- As the material cost and labor cost have been increasing, and sales price cannot be set to the expected level, the investment in the plant production was booked as an impairment loss under extraordinary loss for the fiscal year 2022. (82 million yen)
- However, there are few competitors in plant factory business in Ehime area and needs for stable supply of vegetables is expected to increase due to climate change. We switch to items with higher added value and reduce cost to continue the business.



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# Production System and Capacity

## Integrated manufacturing system



## Production capacity of Matsuyama Factory

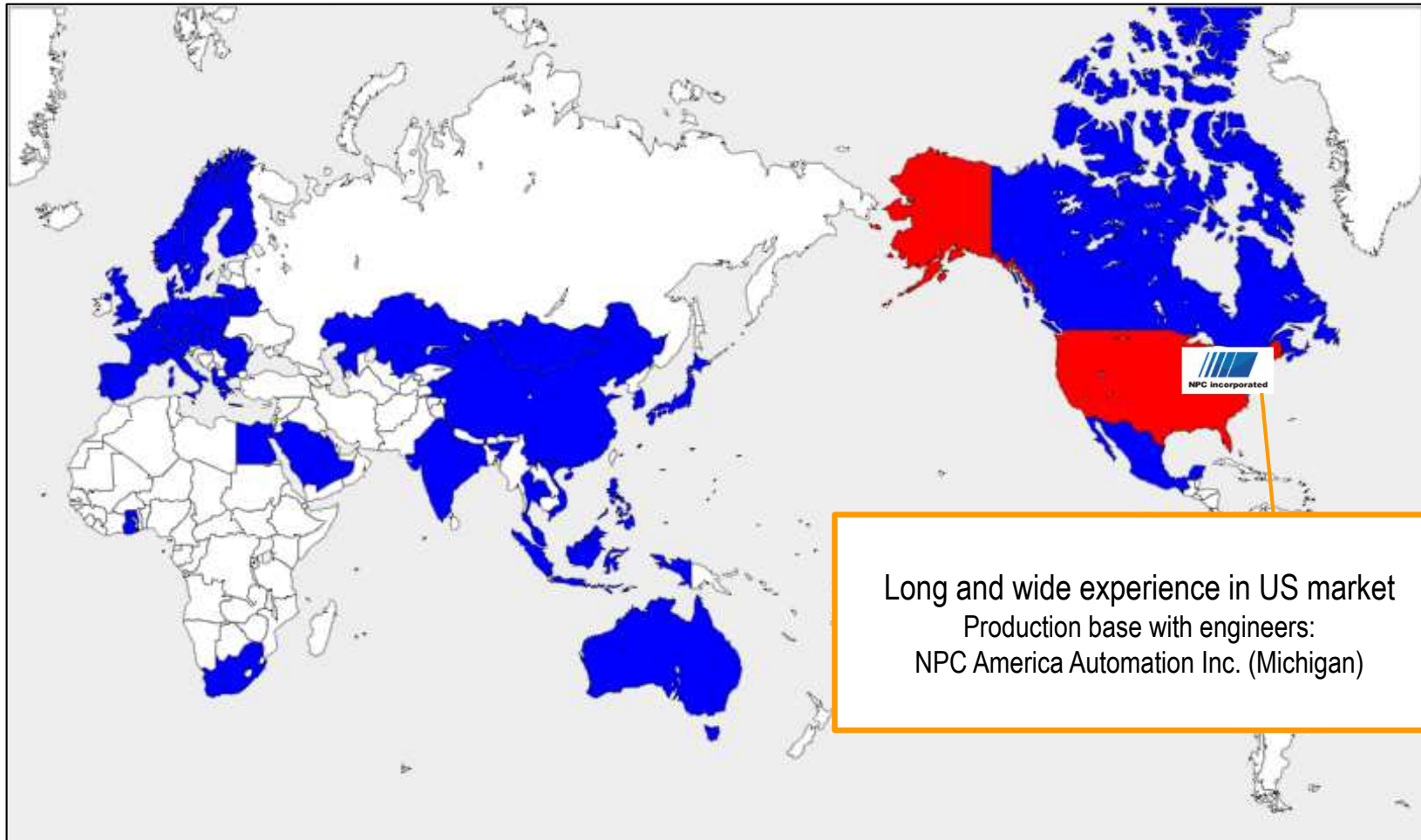


Matsuyama Factory, our production base, has 130 employees and all the manufacturing functions such as R&D, design, manufacturing, and maintenance. This system enables quick and accurate response to requests from customers.

The 5 spacious assembly buildings (height: 8m, area: 40 x 100m) assure vast space for manufacturing any kind of equipment including a large-scale lines.

We enhance production capacity by consigning some assembly work to cooperated companies.

# Overseas Experience and North American Office



We have delivered equipment to more than 50 countries around the world and met local safety standards including the European CE standards. In particular, we can meet the safety standards required in the U.S. market such as the UL and NEC and manufacture machines using Rockwell controllers as required by U.S. customers based on more than 25 years' experience in the country. In addition, one of our advantages is our manufacturing base with engineers stationed in Michigan, from which we can locally provide technical support and market our products to Japanese companies.

# Wide Range of Technical Strengths and Expertise on Equipment Manufacturing



Inspection/  
Measurement technology



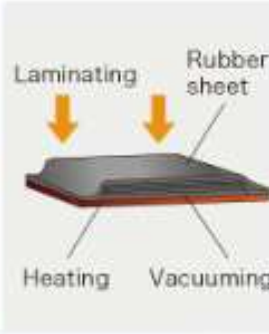
Soldering technology



Dispensing technology



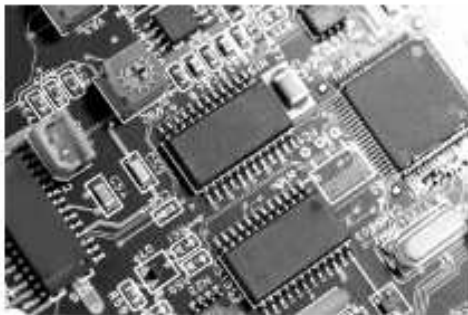
Automated material supply/  
transfer technology



Vacuuming/  
Bonding technology



Data analysis  
technology



Electronic Parts



Display



Automobile



Logistics

Since we entered the PV module industry in 1994, we have developed automation machines for the junction, application, automatic material supply, transfer, image processing and other processes, starting with vacuum laminators based on the vacuum technology, and provided them as an integrated manufacturing line. We now provide equipment as energy-saving solutions in diverse industries including the electronic parts, automotive and display industries by leveraging the technologies and insights we have accumulated for over 25 years to design and manufacture automation machines for industries other than the PV module industry as well.

# A Wide Range of Business Deployment in the Solar Industry



Provision of PV module manufacturing equipment



Inspection service for solar power plants



Reuse panel sales



Recycling of solar panels



Provision of solar panel inspection machines



Provision of solar panel disassembly equipment

Starting with PV module manufacturing equipment, we have provided a variety of services for all aspects from the manufacturing of PV modules through recycling of solar panels, offering solar power plant inspection equipment, inspection services, reuse and recycling, panel disassembly equipment, and other offerings. We used to be involved in contract manufacturing (OEM production) of PV modules and have developed solar-related businesses based on this experience.

# Management Team and Experienced Engineers



Masafumi Ito, President & CEO

- School of Mechanical Engineering, College of Engineering of Osaka Prefecture University
- Sales engineer of automation machines in Itoman Corp.
- Directed business expansion and technical development of PV module manufacturing equipment since NPC entered PV industry
- Expanded various PV-related businesses as CEO



Kazuo Hirose, Senior Managing Director

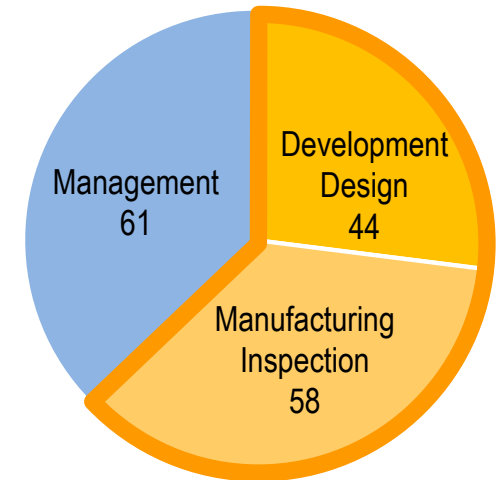
- Engineer in Itoman Engineering Corp.
- Directed development of vacuum-related equipment after establishment of NPC
- In charge of the entire management divisions



Toshiyuki Yauchi, Managing Director

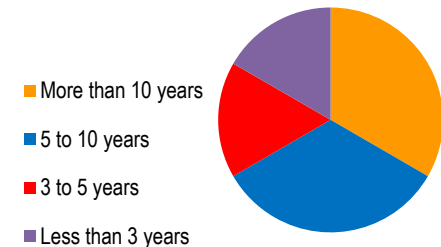
- Engineer in manufacturers such as Mazda, etc.
- Successive service in various technical posts in NPC
  - Design of an integrated PV module manufacturing line
  - Development and design of new mechanisms for automation machines, solar panel disassembly equipment, etc.

Breakdown of number of employees (consolidated, as of August 31, 2022)



Approximately two-thirds of the employees are engineers

Number of years enrolled for the engineers indicated above:



All of our inside directors have an engineer background and 30 years' experience in the machine manufacturing industry including the solar industry. Not only are they familiar with the solar industry, since each member of the management team has a network of contacts and information sources based on their many years of business experience, our company can make appropriate business decisions. In addition, because many of our employees are experienced engineers who have worked for us for a long time, we have a framework where skilled engineers develop younger engineers.



**Innovation**  
Solution for labor shortage



Automation machines

**Maintain and promote PV power generation**



PV module manufacturing machines



Inspection service for PV power plants

**Solution for climate change**



Plant factory using artificial light



PV panel disassembly equipment



Reuse/recycling (intermediate treatment) of PV panels

**Recycling**



Waste separation equipment (equipment for recycling)



Recycling of fowl droppings

**Decarbonization efforts**



We installed a solar power system that produces about 630 kW for in-house power consumption and selling electricity on the rooftop of Matsuyama Factory. (This system is equivalent to about 180 residential solar power systems.)

We have contributed to the spread and sound operation as well as sustainable development of renewable energy through providing equipment and solar-related services. We will continue to deploy businesses that contribute to sustainability around the PV modules and solar panels, for example, through developing businesses in new fields to address climate change and recycling-related equipment.

# Patents, compliance with overseas safety standards, license and registration

## ■ Patent

Patented technology	Number	Description
PV module manufacturing equipment	7	CP mechanism and CF equipment in stringing process Laser inspection mechanism
Vacuum-related machines (laminator)	4	Hot air press mechanism / hot plate mechanism
PV panel disassembly equipment	4	Heated blade separation technology / aluminum frame separation mechanism
Inspection service of solar power plant	1	Multi string prove holder (power generation measuring jig)

## ■ Compliance with overseas safety standards

Area	Standard/directive	Standard number and outline
EU	CE	EN ISO 12100, EN ISO 13849-1, EN ISO 13850, EN ISO 13857, EN ISO 14120, EN ISO 60204-1 General principles for design, safety-related parts of control systems, emergency stop, electrical requirement of machines, etc.
North America	NEC	NFPA 70、NFPA 79、ANSI RIA R15.06 National electrical code, electrical standard for industrial machinery, and industrial robots and robot systems - safety requirements
Canada	CSA	CAS Z431、CSA Z432、CSA Z434、CSA C22.1 Basic and safety principles, safeguarding of machinery, etc.
Semiconductor	SEMI	SEMI S2、SEMI S10、SEMI S22、SEMI S1、SEMI S8 Environmental, health, and safety guideline, electrical design, risk assessment and risk evaluation process, equipment safety labels, etc.

## ■ License, registration, and permission

License, registration, and permission	Registration date, license number
Environmental management system ISO14001	March 30, 2006 E1217
Quality management system ISO9001	August 27, 2009 Q2899
Used goods merchant license	August 29, 2016 Tokyo 306601606280 / September 23, 2016 Ehime 821080001389
Registered electrical contractor	December 15, 2016 Ehime Chuyo Local Bureau 2021155
Industrial waste disposal license	April 4, 2019 License No:08920209040
Industrial waste collection and transportation license	June 4, 2020 License No:03807209040



1. Business Model
2. Market Environment
3. Source of Competitiveness
- 4. Business Plan**
5. Risk Information

Aim at steady growth with the business of PV module manufacturing equipment and automation machines, for which mid-term to long-term capital expenditure is expected, and by enhancing business portfolio.

## Sales

### Machinery Business

#### 1. PV module manufacturing equipment

- Continuous capital expenditure by the US main customer is expected backed by the strong US market
- Investments in next-generation PV modules are expected.

#### 2. Automation machines

- Mid-term to long-term capital expenditure is expected from the well-performing main customer in Japan.
- Enhance acquisition of steady customers.

### Environmental Business

#### 1. Solar panel disassembly equipment

Increase in sales volume is expected as more companies are entering end-of-life solar panel treatment business in Japan and overseas.

- #### 2. Accumulate businesses with recurring revenue such as solar power plant inspection service, reuse & recycling, plant factory business, etc.
- #### 3. Launch new products and services for the industrial waste treatment companies to be from FY2023/

## Profits

-Profits for FY2023 is expected to be low due to the following factors:

1)Cost increase due to longer delivery time and price raise in parts

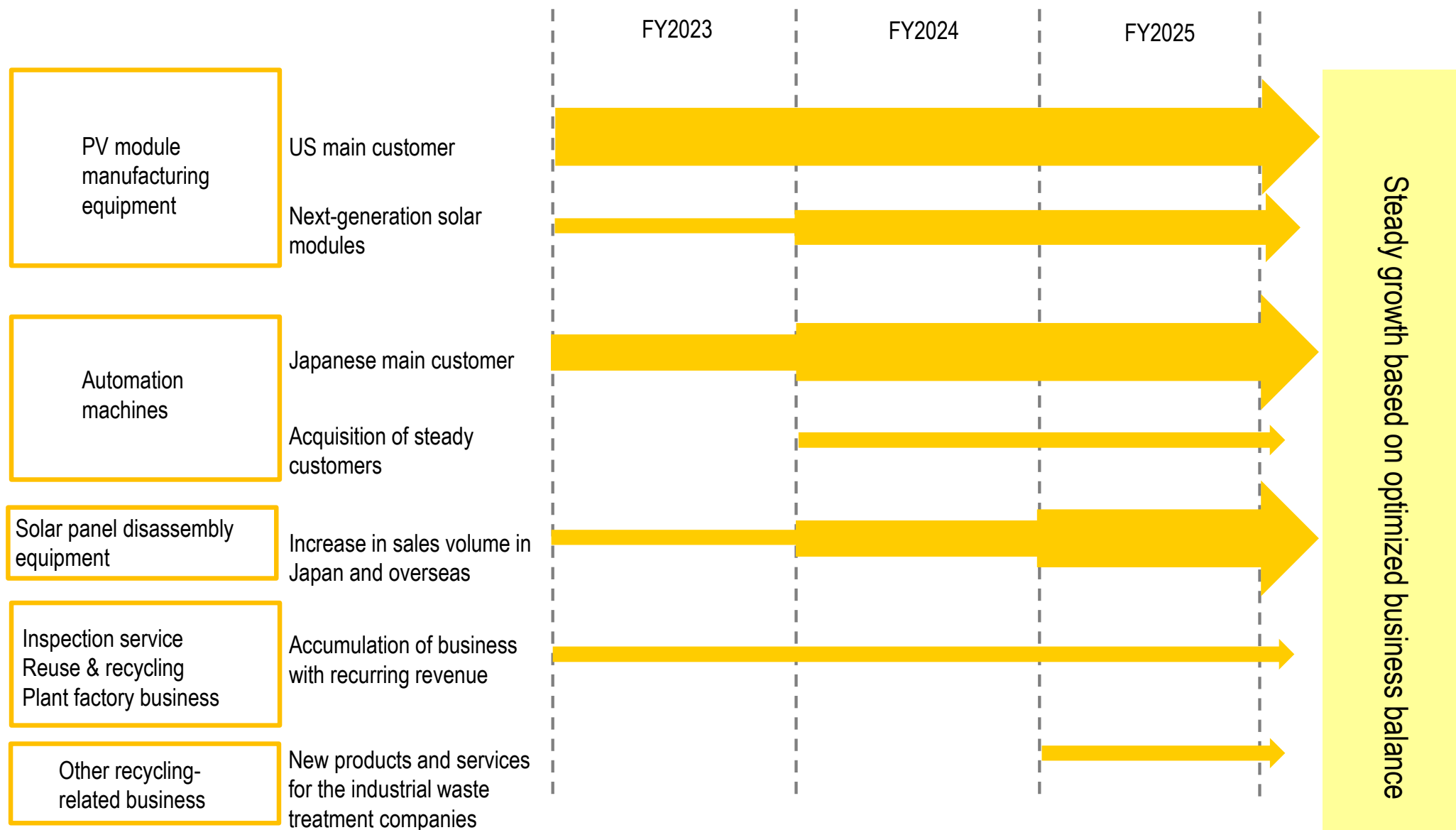
2)New equipment that includes new designs account for large portion of the sales, and there are few profitable projects such as upgrading and expansion.

However, equipment scheduled to be sold from FY2024 onwards include less new designs, and higher parts prices will be reflected in equipment prices, so profit margins are expected to improve.

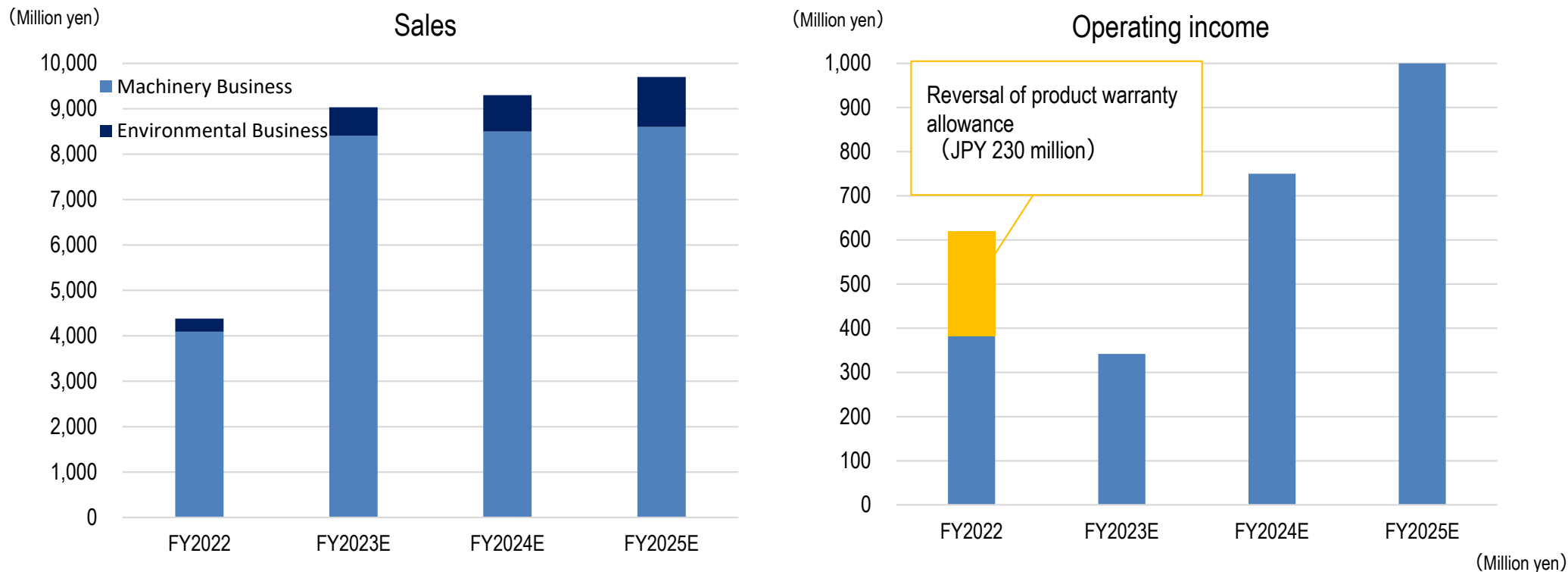
-SG&A expenses are expected to be at the same level throughout the three years' period.

-No large capital expenditure is planned for the period.

# Mid-term Management Plan (FY2023-FY2025)



## Performance goals



	FY2022 (Results)	FY2023 (Plan)	FY2024 (Plan)	FY2025 (Plan)
Sales	4,379	9,034	9,300	9,700
Machinery Business	4,090	8,409	8,500	8,600
Environmental Business	288	624	800	1,100
Operating income	620	342	750	1,000

# Short-term Plan: Progress of Company Action for FY2022

	Action	Progress at the end of FY2022
PV module manufacturing equipment	<ul style="list-style-type: none"> <li>Win orders for equipment for First Solar's new factories in India and the US. Sales to be booked in FY2023</li> <li>Satisfy the needs from the existing customers in the US and Japan who need high-end equipment.</li> </ul>	<ul style="list-style-type: none"> <li>Received orders from First Solar as planned (approximately JPY 5.7 bill.). Projects are making progress for sales booking in FY2023.</li> <li>Received orders of new large-scale equipment for satellite from an existing customer in Japan.</li> </ul>
Automation Machines Vacuum-related equipment	<ul style="list-style-type: none"> <li>Focus on the electronic parts industry where capital investment is active and accumulate experience in other industries in Japan.</li> <li>Seamlessly start operation in the US</li> </ul>	<ul style="list-style-type: none"> <li>Received orders that exceed estimation from Japanese electronic parts industry.</li> <li>Opened a subsidiary in the US and booked sales of an automation machine. Enhanced sales on sales of solar panel disassembly equipment.</li> </ul>
Inspection service for solar power plant	<ul style="list-style-type: none"> <li>Win orders for pre-operation inspection for power plants that have not started operation yet.</li> <li>Win orders for regular inspection for power plants that have started operation.</li> </ul>	<ul style="list-style-type: none"> <li>Steadily received orders and booked sales of pre-operation inspection and regular inspection.</li> </ul>
Reuse and recycling of solar panels	<ul style="list-style-type: none"> <li>Expand our network with partner companies.</li> <li>Improve the recycling rate to reduce recycling cost.</li> </ul>	<ul style="list-style-type: none"> <li>Established a plan to build a network between companies involved in panel collection.</li> <li>Conducted R&amp;D on application for recycling cost reduction.</li> </ul>
Solar panel disassembly equipment	<ul style="list-style-type: none"> <li>Answer inquiries from customers in and outside Japan.</li> <li>Win orders to achieve sales of 1 billion yen for the coming three years.</li> </ul>	<ul style="list-style-type: none"> <li>Booked sales of s frame separator to a French waste treatment company.</li> <li>Received orders from Japan and overseas; Automated disassembly line: 3 lines (France and Japan) Frame separator: 2 units (US and Japan)</li> </ul>
Plant factory business	<ul style="list-style-type: none"> <li>Aim to return to profitability by FY2024 by adding items and gradually expanding production capacity.</li> <li>Develop an automatic cultivation system.</li> </ul>	<ul style="list-style-type: none"> <li>Doubled production in February 2022</li> <li>Booked the investment in production equipment as impairment loss at the end of FY2022 because material cost and labor cost have been increasing and sales price cannot be set to the expected level.</li> <li>Continue business by shifting to items with higher added value, raising sales price, and reducing cost.</li> </ul>
New business	<ul style="list-style-type: none"> <li>Investment and technology development in sustainable businesses other than solar-related businesses</li> <li>Development of automatic PET bottle sorting machine, fowl droppings recycling test</li> </ul>	<ul style="list-style-type: none"> <li>Conducted on-site test of automated sorting machine for PET bottles.</li> <li>Continue with tests and component analysis for recycling of fowl droppings.</li> </ul>

# Short-term Plan: Business Results for FY 2022

(Million yen)

	FY 2021		FY 2022					
	Results (A)		Initial forecast (B) (2021.10.12)		Results			
	Amount	vs. Sales (%)	Amount	vs. Sales (%)	Amount	vs. Sales (%)	vs. (A) (%)	vs. (B) (%)
Sales	7,823	100.0	5,775	100.0	<b>4,379</b>	100.0	△ 44.0	△ 24.2
Gross Profit	2,138	27.3	1,647	28.5	<b>1,526</b>	34.8	△28.6	△7.3
SG & A expenses	966	12.3	986	17.1	<b>906</b>	20.7	△6.2	△8.1
Operating income	1,172	15.0	661	11.4	<b>620</b>	14.2	△47.1	△6.2
Non-operating income	3	0.0	3	0.1	<b>24</b>	0.5	700.0	700.0
Non-operating expenses	24	0.3	18	0.3	<b>27</b>	0.6	12.5	50.0
Ordinary income	1,151	14.7	646	11.2	<b>617</b>	14.1	△46.4	△4.9
Extraordinary income	-	-	-	-	-	-	-	-
Extraordinary loss	-	-	-	-	<b>82</b>	-	-	-
Net income before tax	1,151	14.7	646	11.2	<b>535</b>	12.2	△53.5	△17.2
Income tax-current	203	2.6	5	0.1	<b>3</b>	0.1	△98.5	△40.0
Income tax-deferred	169	2.2	-	-	<b>152</b>	3.5	△10.1	-
Net income attributable to owners of the parent	778	9.9	641	11.1	<b>379</b>	<b>8.7</b>	△51.3	△40.9

Note: 1. The numbers concerning FY2021 are retroactively revised according to the Accounting Standard for Revenue Recognition and other related guidelines applied since FY2022.

2. Percentages at vs. (A) and (B) represent increase/decrease rate.

# Short-term Plan: Business Results for FY 2022

## Details of the differences between the initial forecast and the results

### Sales

Fell short of the forecast mainly due to the factors below:

- Sales booking of some automation machines was delayed due to longer delivery time of parts which prolonged the lead-time. Sales booking was delayed in some projects of which we expected to receive order and book sales during current fiscal year.
- Cancelled a contract with a US customer because feasibility of the project lowered after repeated postponement, while the credit risk increased.
- Sales booking of a solar panel disassembly line for a French industrial waste treatment company, which was planned to be booked in FY2022, shifted to FY2023 because of a delay in shipping and acceptance schedule.

### Gross Profit

- Turned out to be lower than the forecast.
- Provision for product warranties was reversed to cost of sales.

### SG & A expenses

- Decreased mainly due to decrease in tax and dues, commission expenses, and R&D expenses.

### Operating income-Ordinary income

- Lower than the forecast due to decrease in gross profit.

### Net income attributable to owners of the parent

- Turned out to be lower than the forecast after booking the investment in the plant factory business as an impairment loss under extraordinary loss, increase and decrease in deferred tax assets.

# Short-term Plan: Company Actions for FY 2023

<p>PV module manufacturing equipment</p>	<ul style="list-style-type: none"> <li>■ Book the sales of equipment for First Solar's new factories (India and the US). Acquire orders of equipment for expansion of Ohio factory and the new factory in Alabama.</li> <li>■ Satisfy the needs from the existing customers in the US and Japan who need high-end equipment.</li> </ul>
<p>Automation Machines Vacuum-related equipment</p>	<ul style="list-style-type: none"> <li>■ Focus on the customer in the Japanese electronic parts industry whose capital investment is active.</li> <li>■ Acquire stable customers.</li> </ul>
<p>Inspection service for solar power plant</p>	<ul style="list-style-type: none"> <li>■ Win orders for pre-operation inspection for power plants that have not started operation yet.</li> <li>■ Win orders for regular inspection for power plants that have started operation.</li> </ul>
<p>Reuse and recycling of solar panels</p>	<ul style="list-style-type: none"> <li>■ Establish a network for collection of end-of-life solar panels.</li> <li>■ Improve the recycling rate and reduce recycling cost by application development.</li> </ul>
<p>Solar panel disassembly equipment</p>	<ul style="list-style-type: none"> <li>■ Book the sales of projects of which we have received orders.</li> <li>■ Enhance sales at the US subsidiary by installing a demo machine. Actively respond to inquiries.</li> <li>■ Expand the product lineup.</li> </ul>
<p>Plant factory business</p>	<ul style="list-style-type: none"> <li>■ Continue the business to address sustainability although the investment in the production facility was booked as an impairment in FY 2022.</li> <li>■ Reduce cost by improving work efficiencies and switch to vegetables with higher added value.</li> </ul>
<p>New business</p>	<ul style="list-style-type: none"> <li>■ Conduct development of automation machines for industrial waste treatment industry and fowl droppings recycling test.</li> </ul>

\* Please refer to the Business Information for FY 2022, released on October 14, 2022, for actions in FY 2023.



# Short-term Plan: Business Forecast for FY 2023

## Consolidated Statement of Income

	1st half		Full year		(Million yen)
	Amount	vs. Sales(%)	Amount	vs. Sales(%)	
Sales	<b>4,549</b>	100.0	<b>9,034</b>	100.0	
Machinery Business	<b>4,330</b>	95.1	<b>8,409</b>	93.0	
Environmental Business	<b>219</b>	4.8	<b>624</b>	6.9	
Gross Profit	<b>566</b>	12.4	<b>1,297</b>	14.3	
Machinery Business	<b>507</b>	11.7	<b>1,096</b>	13.0	
Environmental Business	<b>59</b>	26.9	<b>200</b>	32.0	
Operating income	<b>87</b>	1.9	<b>342</b>	3.8	
Ordinary income	<b>87</b>	1.9	<b>342</b>	3.8	
Net income attributable to owners of the parent	<b>70</b>	1.5	<b>283</b>	3.1	

## Expenses and profits

-In FY 2023, profit rate is expected to be low due to the following factors:

- 1) Longer lead-time and price increase of parts.
- 2) Most of the sales will be for equipment that includes new designs for First Solar's new factories in the US and India, and there are few projects of upgrading and expansion which has higher profit rates.

However, equipment scheduled to be sold from FY 2024 onwards will include less new designs, and higher parts prices will be reflected in equipment prices, so profit margins are expected to improve.

-SG & A expenses are expected to be at the same level throughout the three years' period.

-No large capital expenditure is planned for the period.

1. Business Model
2. Market Environment
3. Source of Competitiveness
4. Business Plan
5. Risk Information

# Business Risks and Countermeasures (1)

Description of risk	Countermeasures, etc.	Timing	Possibility	Impact
Risks associated with the stagnation or deceleration of the solar market - Decrease in sales and profits - Impairment loss of assets	- Enhance products and services for installed solar panels. - Enhance products and services for discarded panels. - Expand automation machine business and new business other than solar.	Occasionally	Low	Large
Exchange rate fluctuations - Exchange rate loss - Increase in overseas procurement costs (when the yen is weak) - Deterioration of price competitiveness (when the yen is strong)	- Basically, conduct business with overseas customers in yen. - Reserve exchange rate when exceptionally conducting business in foreign currency. - Increase the overseas procurement ratio when the yen becomes strong.	Occasionally	Medium	Small
Variations associated with the sales recording time and the profit rate of individual projects - Decrease in sales and profits (including carry-over) - Decrease in profit margins	- Improve quality through efforts according to ISO 9001. - Review the progress of processes in each project and address problems at an early stage as needed. - Reduce risks of failure to satisfy specifications and delay through pre-shipment inspections.	Occasionally	High	Medium
Variations in the business environment of large customers - Decrease in sales and profits - Shrinkage or suspension of deals	- Strengthen relationships with large companies through research and development as well as cost reductions. - Strengthen marketing targeting customers other than large customers. - Develop automation machines and environmental business so as not to heavily rely on large customers.	Occasionally	Low	Medium
Lengthening of lead time of parts - Lengthening of lead time of products - Increase in manufacturing costs	- Attempt overseas procurement through our overseas subsidiary. - Use alternative parts from the design phase.	Current	High	Large
Price increase of parts and raw materials - Decrease in profit due to increase in manufacturing costs	-Maintain purchase price as low as possible through negotiation with suppliers. -Reflect the increase in parts price to selling price of machines through negotiation with customers.	Current	High	Large

# Business Risks and Countermeasures (2)

Description of risk	Countermeasures, etc.	Timing	Possibility	Impact
Soaring transportation costs - Increased costs of products for overseas	- Conclude free carrier (FCA) contracts.	Near future	High	Medium
Lengthening of the transportation period - Delay in recording sales - Increase in costs due to unavailable shipping service	- Ensure sufficient lead time including the transportation period in the contract with the customer.	Near future	Low	Medium
Natural disaster - Decrease or loss of production capacity	- The cell production system allows us to continue production activities as long as staff and space are secured. - Ensure flexible production capacity using partner factories. - Land with low risks of tsunami damage, flood damage and sediment disaster	Unknown	Medium	Large
Deferred tax assets -Changes in projections and assumptions on taxable income expectation -Revisions of the tax system, including tax rate changes, revisions of accounting standards, etc.	- Carefully assess feasibility of the profit plan to book deferred tax assets based on the taxable income which is reasonably and conservatively calculated. - Regularly revise recoverability of deferred tax assets.	Occasionally	Medium	Medium
COVID-19 - Limitation of visa granting for local work in overseas projects - Decrease in efficiency due to voluntary quarantine after returning home	- Outsource some work to local companies.	Near future	High	Medium

\* For other risks, refer to “Business and Other Risks” in the financial statements submitted on November 30, 2022.

# Thank you very much for your interest in NPC!

“We, through creation of products,  
aim to be a company needed by nature, society and people.”

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**Next disclosure of “Business Plan and Potential for Growth” is scheduled for November 2023.**