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# Abalance

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# INDEX

<b>Executive summary</b> .....	<b>3</b>
<b>Key Financial Data</b> .....	<b>5</b>
.....	5
<b>Recent updates</b> .....	<b>6</b>
<b>Trends and outlook</b> .....	<b>7</b>
Quarterly trends and results .....	7
Full-year company forecast .....	11
Medium-term management plan .....	11
<b>Business</b> .....	<b>14</b>
Business overview .....	14
Business overview by reportable segment .....	15
Earnings structure .....	18
<b>Market and value chain</b> .....	<b>22</b>
<b>Competition</b> .....	<b>26</b>
<b>Strengths and weaknesses</b> .....	<b>28</b>
Strengths .....	28
Weaknesses .....	29
<b>Financial statements</b> .....	<b>31</b>
Income statement .....	31
Balance sheet .....	31
Cash flow statement .....	32
<b>Other information</b> .....	<b>33</b>
Company profile .....	36

# Executive summary

Abalance Corporation (TSE Standard: 3856) primarily manufactures and sells solar panels; the planning, development, sale, operation, and maintenance of solar power systems; and the sale of electricity generated by proprietary solar power plants. As a holding company, Abalance oversees and controls group management, while subsidiaries handle business operations. In FY06/23, consolidated revenue was JPY215.3bn and operating profit was JPY12.8bn. Businesses are managed under four reportable segments and Other businesses; the mainstay segments are the Solar Panel Manufacturing business (96.1% of consolidated revenue and 92.1% of operating profit before adjustments and inclusion of Other businesses) and the Green Energy business (3.7% and 7.8%).

The company was established in April 2000 as a developer and administrator of knowledge management software. In November 2011, it converted WWB Corporation (unlisted; planned, sold, and installed solar power systems) into a wholly owned subsidiary through an exchange of shares. In December 2020, Vietnam Sunergy Joint Stock Company (VSUN; unlisted), a Vietnamese solar panel manufacturer generating revenue over three times higher than Abalance at the time (FY06/21), was made into a consolidated subsidiary (the company held approximately 43.2% of voting rights at end-June 2023).

**Solar Panel Manufacturing business:** VSUN, which operates this business, was established in June 2015. Headquartered in the Bac Giang Province of Northeast Vietnam, VSUN has four solar panel plants in Vietnam with an annual production capacity totaling 5GW, and a cell plant scheduled for completion at end-October 2023 that will have an annual production capacity totaling 4GW. It sources raw materials from Europe, the US, and Asia and manufactures solar panels at its plants in Vietnam, and sells products mainly to the US, Europe, and other countries directly or through overseas branches. Since its establishment, the company has expanded VSUN's manufacturing capacity, making it one of the leading companies in Vietnam.

**Green Energy business:** Mainly operated by subsidiaries WWB and Valors Corporation, the Green Energy segment comprises a recurring revenue business (accounting for 40% of segment revenue in FY06/23) and a one-time revenue business (60%). The recurring revenue business is based on a model through which the company continues to own the solar power plants it either develops or acquires, earning income from selling the generated electricity to power utilities. In the one-time revenue business, the company engages in solar power plant trades with renewable energy consumers, sells products associated with power generation facilities, and engages in direct sales or uses agents to provide end-to-end services for solar projects (such as planning, engineering, development/construction, operation and maintenance, and recycling) to companies and consumers. Abalance plans to expand the portfolio of solar power plants under its ownership and further raise the revenue mix of its recurring revenue business to secure stable earnings.

The company's current portfolio includes over 110 solar power plants located in Japan and overseas, and the total output capacity of these facilities is over 140MW. Abalance seeks to achieve 1GW in total output capacity by 2030.

In September 2023, the company formulated a new medium-term management plan (FY06/24–FY06/26) that maintains a power generation capacity of 1GW in Japan and overseas, but aims to increase the annual production capacity of solar panels from 5GW in FY06/23 to 10GW in FY06/26, and the annual production capacity of cell plants from 4GW in late October 2023 to 10GW in FY06/26. To secure funds for future investments and other efforts, the company plans to borrow new funds and list its cell subsidiary, Vietnam Sunergy Cell Company Limited (hereinafter, "Cell Company"), on the US NASDAQ stock exchange through a special purpose acquisition company (SPAC).

Although the global solar panel market is characterized by oversupply and severe price competition, Shared Research understands that VSUN's competitors comprise mainly major solar panel manufacturers in China.

The International Energy Agency (IEA) predicts that global electricity demand will expand, with renewables such as solar and wind power becoming mainstream sources. IEA presents an outlook on installed capacity for each energy source based on three scenarios. In the most conservative scenario, it expects installed electricity capacity of solar power to grow from 1,145GW in 2022 to 4,699GW in 2030, and to 12,639GW in 2050. This will lead to expanded demand for solar panels, and amid a push toward the reevaluation of supply chains due to US–China trade frictions and other factors, Shared Research understands that demand will be particularly strong for solar panels made outside China, such as those of VSUN.

## Earnings trends

In FY06/23, consolidated revenue was JPY215.3bn (+133.7% YoY), operating profit was JPY12.8bn (+697.8% YoY), recurring profit was JPY14.0bn (+890.0% YoY), and net income attributable to owners of the parent was JPY5.0bn (+516.0% YoY). OPM

was 5.9% (1.7% in FY06/22). The increase in revenue and profits was due to strong panel sales in the European and the US markets, the launch of the fourth solar panel factory operation from January 2023, passing on the soaring prices of components and transportation costs, and the reduction in container freight rates.

The company's full-year forecast for FY06/24 projects revenue of JPY251.8bn (+17.0% YoY), operating profit of JPY15.8bn (+23.4% YoY), recurring profit of JPY15.8bn (+12.6% YoY), and net income attributable to owners of the parent of JPY7.0bn (+41.0% YoY). With the commencement of operations at the fourth solar panel factory and cell plant, the company plans to increase revenue by expanding its sales channels to the US, Europe, and other regions where solar panels are sold. In terms of profit, the company aims to secure stable earnings by producing cells in-house (procured externally up to now), setting panel sales prices according to component prices and container freight rates, and improving production efficiency.

The Abalance group has established a goal of becoming a core global company in the field of renewable energy by 2030 and positions building a supply chain for solar panel manufacturing and the Green Energy business as the engines for sustainable growth and maximization of corporate value. In September 2023, the company formulated a new medium-term management plan (FY06/24–FY06/26), which the company views as an acceleration phase toward achieving the goal. The company expects its revenue and operating profit to expand to JPY355.8bn and JPY30.8bn, respectively, by end-FY06/26, with an anticipated increase in OPM to 8.7%. CAGR during the plan period is expected to be 18.2% for revenue and 34.0% for operating profit.

## Strengths and weaknesses

Abalance's strengths, according to Shared Research (See the "Strengths and weaknesses" section for details)

- Achieves differentiation by expanding solar panel manufacturing capacity in Vietnam
- With the addition of VSUN's manufacturing function, the company has formed a global supply chain and established the Japan brand, providing end-to-end services in Japan that no other peers can match
- VSUN is well recognized by third-party organizations and major purchasers for both its sustainable procurement practices and its solar panel quality, comparable with major manufacturers

### Weaknesses

- Solar panels, VSUN's main product, are susceptible to demand/supply and price fluctuations due to policy changes by various governments. In response, VSUN plans to reduce the risk of policy changes by not only producing panels and internalizing component manufacturing in Vietnam but also planning panel production in the US.
- The scale of VSUN solar panel and cell manufacturing is still small compared to major manufacturers. The company plans to expand its panel and cell manufacturing capacity, as well as manufacture ingots and wafers.
- To sustain a high level of investment using bank loans, the company must improve financial soundness. The company has set a target equity ratio of 20% for FY06/26 and plans to improve this by increasing retained earnings.

# Key Financial Data

	FY06/14	FY06/15	FY06/16	FY06/17	FY06/18	FY06/19	FY06/20	FY06/21	FY06/22	FY06/23	FY06/24
<b>Income statement(JPYmn)</b>											
	Cons.	Cons.	Cons.	Cons.	Cons.	Cons.	Cons.	Cons.	Cons.	Cons.	Company forecast
<b>Revenue</b>	<b>3,347</b>	<b>4,396</b>	<b>4,540</b>	<b>6,495</b>	<b>7,301</b>	<b>5,985</b>	<b>6,678</b>	<b>26,901</b>	<b>92,122</b>	<b>215,284</b>	<b>251,800</b>
YoY	45.3%	31.4%	3.3%	43.1%	12.4%	-18.0%	11.6%	302.8%	242.4%	133.7%	17.0%
<b>Gross profit</b>	<b>738</b>	<b>1,081</b>	<b>1,108</b>	<b>1,489</b>	<b>2,178</b>	<b>1,873</b>	<b>1,762</b>	<b>4,788</b>	<b>9,613</b>	<b>29,621</b>	
YoY	15.1%	46.5%	2.5%	34.4%	46.3%	-14.0%	-5.9%	171.7%	100.8%	208.1%	
Gross profit margin	22.0%	24.6%	24.4%	22.9%	29.8%	31.3%	26.4%	17.8%	10.4%	13.8%	
<b>Operating profit</b>	<b>264</b>	<b>420</b>	<b>397</b>	<b>115</b>	<b>927</b>	<b>608</b>	<b>362</b>	<b>1,361</b>	<b>1,605</b>	<b>12,804</b>	<b>15,800</b>
YoY	28.4%	59.5%	-5.5%	-71.0%	704.7%	-34.4%	-40.5%	276.4%	17.9%	697.8%	23.4%
Operating profit margin	7.9%	9.6%	8.8%	1.8%	12.7%	10.2%	5.4%	5.1%	1.7%	5.9%	6.3%
<b>EBITDA</b>	<b>296</b>	<b>468</b>	<b>431</b>	<b>169</b>	<b>1,050</b>	<b>882</b>	<b>627</b>	<b>2,081</b>	<b>3,209</b>	<b>15,096</b>	
YoY	28.9%	58.3%	-7.9%	-60.8%	521.0%	-16.0%	-29.0%	232.1%	54.2%	370.4%	
EBITDA margin	8.8%	10.6%	9.5%	2.6%	14.4%	14.7%	9.4%	7.7%	3.5%	7.0%	
<b>Recurring profit</b>	<b>241</b>	<b>339</b>	<b>427</b>	<b>49</b>	<b>874</b>	<b>566</b>	<b>306</b>	<b>1,269</b>	<b>1,418</b>	<b>14,038</b>	<b>15,800</b>
YoY	108.5%	40.9%	25.8%	-88.6%	1700.1%	-35.2%	-46.0%	315.3%	11.7%	890.0%	12.6%
Recurring profit margin	7.2%	7.7%	9.4%	0.7%	12.0%	9.5%	4.6%	4.7%	1.5%	6.5%	6.3%
<b>Net income attributable to owners of the parent</b>	<b>234</b>	<b>200</b>	<b>231</b>	<b>-176</b>	<b>757</b>	<b>316</b>	<b>211</b>	<b>537</b>	<b>806</b>	<b>4,965</b>	<b>7,000</b>
YoY	100.6%	-14.6%	15.8%	-	-	-58.2%	-33.1%	154.2%	50.1%	516.0%	41.0%
Net margin	6.99%	4.55%	5.10%	-2.7%	10.4%	5.3%	3.2%	2.0%	0.9%	2.3%	2.8%
<b>Per-share data(JPY, stock split, adjusted for reverse stock split)</b>											
Shares issued(year-end, '000)	5,041	5,041	5,041	5,190	5,190	5,190	5,196	5,334	5,567	17,465	
EPS	20.93	13.22	15.31	-	48.64	20.38	13.64	34.21	49.12	293.36	413.53
EPS(fully diluted)	20.69	13.21	-	-	48.48	20.38	-	33.70	49.04	290.41	-
Dividend per share	0.00	3.33	3.67	3.67	5.67	5.67	5.67	5.67	6.00	8.00	-
Book value per share	57.13	68.68	80.65	68.42	113.54	127.15	134.99	251.62	353.33	726.88	-
<b>Balance sheet(JPYmn)</b>											
Total current assets	1,715	2,093	2,420	4,692	5,227	6,078	8,553	22,537	57,450	100,049	
Cash and deposits	494	407	496	672	601	799	1,209	4,722	3,966	20,619	
Notes and accounts receivable	408	525	473	335	335	393	303	1,312	6,196	2,011	
Merchandise and finished goods	499	263	385	423	327	172	246	6,480	26,740	48,827	
Tangible fixed assets	161	189	223	1,222	1,456	4,239	5,529	15,201	20,507	32,943	
Intangible assets	81	61	5	290	217	195	110	365	4,688	7,523	
Investments and other assets	115	188	142	195	289	459	554	1,268	2,463	3,134	
Total assets	2,073	2,531	2,790	6,400	7,189	10,985	14,765	39,388	85,121	143,691	
Total current liabilities	821	1,127	1,368	3,545	3,873	4,641	6,745	26,212	57,721	100,356	
Total fixed liabilities	386	361	203	1,733	1,499	4,312	5,859	8,398	19,452	20,563	
Total liabilities	1,207	1,488	1,571	5,279	5,373	8,953	12,605	34,611	77,174	120,920	
Total net assets	866	1,043	1,219	1,121	1,816	2,032	2,159	4,777	7,947	22,771	
Shareholders' equity(excl. stock acquisition rights and non-controlling interests )	864	1,038	1,219	1,077	1,767	1,969	2,093	4,006	5,873	12,596	
<b>Cash flow statement(JPYmn)</b>											
Cash flows from operating activities	-77	57	206	-984	405	-147	-861	-608	-6,449	18,526	
Cash flows from investing activities	-116	-252	-75	-864	-559	-1,620	-472	-1,391	-13,221	-20,670	
Cash flows from financing activities	393	104	-85	1,991	-62	1,913	1,465	5,290	17,752	17,235	
<b>Financial ratios</b>											
ROA (RP-based)	14.8%	14.7%	16.0%	1.1%	12.9%	6.2%	2.4%	4.7%	2.3%	12.3%	
Return on equity(ROE)	34.2%	21.0%	20.5%	-15.3%	53.2%	16.9%	10.4%	17.6%	16.3%	53.8%	
Equity ratio	41.7%	41.0%	43.7%	16.8%	24.6%	17.9%	14.2%	10.2%	6.9%	8.8%	

Source: Shared Research based on company data

Notes: The company conducted a 100-for-1 stock split in FY06/14, and a 3-for-1 stock split in September 2022. Other changes in the number of shares outstanding are due to capital increases via third-party allotment and/or the exercise of share subscription rights

EBITDA is obtained by adding depreciation and goodwill amortization to operating profit

Dividend per share (dividend per share ) has yet to be determined for FY06/24

Any differences between figures in the table and those in company data are due to rounding

# Recent updates

## VSUN has commenced construction of a new plant for the production of ingots and wafers

2024-01-22

Abalance Corporation has announced that Vietnam Sunergy Joint Stock Company (VSUN) has commenced construction of a new plant (Phase 1) for the production of ingots and wafers, key components of solar panels.

Following the completion of the cell plant in the fall of 2023, the company plans to establish a new plant for the upstream process of producing ingots (casting, slicing, polishing, etc.) and wafers, with operation scheduled to begin by the first half of 2024. The operation of the new plant is aimed at securing a stable supply of key components and responding to import regulations in each country, while at the same time strengthening the global supply chain to improve long-term competitiveness.

### Overview of new plant

Name: Vietnam Sunergy Joint Stock Company Ingot, Wafer Plant

Location: Northern industrial park, Vietnam

Site area: Approximately 132,000sqm

Annual production capacity: 4GW

Manufactured products: Ingots and wafers, key components for solar panel manufacturing

Fundraising: Funded by the company itself

# Trends and outlook

## Quarterly trends and results

Earnings (quarterly) (cumulative) (JPYmn)	FY06/23				FY06/24				FY06/24	
	Q1	Q1-Q2	Q1-Q3	Q1-Q4	Q1	Q1-Q2	Q1-Q3	Q1-Q4	% of forecast FY forecast	
Revenue	55,546	111,553	162,693	215,284	57,740	108,543			43.1%	251,800
YoY	485.2%	323.5%	194.0%	133.7%	3.9%	-2.7%				17.0%
Cost of revenue	50,893	99,097	143,113	185,663	49,120	89,838				
YoY	528.0%	357.3%	192.3%	125.0%	-3.5%	-9.3%				
Cost of revenue ratio	91.6%	88.8%	88.0%	86.2%	85.1%	82.8%				
Gross profit	4,653	12,455	19,580	29,621	8,620	18,704				
YoY	235.5%	166.7%	207.4%	208.1%	85.3%	50.2%				
Gross profit margin	8.4%	11.2%	12.0%	13.8%	14.9%	17.2%				
SG&A expenses	3,147	7,546	10,366	16,816	3,935	8,647				
YoY	177.8%	78.1%	80.5%	110.0%	25.0%	14.6%				
SG&A ratio	5.7%	6.8%	6.4%	7.8%	6.8%	8.0%				
Operating profit	1,506	4,908	9,213	12,804	4,684	10,057			63.7%	15,800
YoY	492.9%	1030.9%	-	697.8%	211.0%	104.9%				23.4%
Operating profit margin	2.7%	4.4%	5.7%	5.9%	8.1%	9.3%				6.3%
Recurring profit	1,321	5,602	10,364	14,038	4,518	10,507			66.5%	15,800
YoY	668.0%	-	-	890.0%	242.0%	87.6%				12.6%
Recurring profit margin	2.4%	5.0%	6.4%	6.5%	7.8%	9.7%				6.3%
Net income attributable to owners of the parent	451	2,148	3,764	4,965	1,744	3,635			51.9%	7,000
YoY	-42.8%	190.7%	428.7%	516.0%	286.7%	69.2%				41.0%
Net margin	0.8%	1.9%	2.3%	2.3%	3.0%	3.3%				2.8%
Earnings (quarterly) (JPYmn)	FY06/23				FY06/24					
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4		
Revenue	55,546	56,007	51,140	52,591	57,740	50,803				
YoY	485.2%	232.4%	76.4%	43.0%	3.9%	-9.3%				
Cost of revenue	50,893	48,204	44,016	42,550	49,120	40,718				
YoY	528.0%	255.3%	61.2%	26.9%	-3.5%	-15.5%				
Cost of revenue ratio	91.6%	86.1%	86.1%	80.9%	85.1%	80.1%				
Gross profit	4,653	7,802	7,125	10,041	8,620	10,084				
YoY	235.5%	137.6%	319.1%	209.6%	85.3%	29.2%				
Gross profit margin	8.4%	13.9%	13.9%	19.1%	14.9%	19.8%				
SG&A expenses	3,147	4,399	2,820	6,450	3,935	4,712				
YoY	177.8%	41.8%	87.1%	184.9%	25.0%	7.1%				
SG&A ratio	5.7%	7.9%	5.5%	12.3%	6.8%	9.3%				
Operating profit	1,506	3,402	4,305	3,591	4,684	5,373				
YoY	492.9%	-	-	266.8%	211.0%	57.9%				
Operating profit margin	2.7%	6.1%	8.4%	6.8%	8.1%	10.6%				
Recurring profit	1,321	4,281	4,762	3,674	4,518	5,989				
YoY	668.0%	-	-	257.0%	242.0%	39.9%				
Recurring profit margin	2.4%	7.6%	9.3%	7.0%	7.8%	11.8%				
Net income attributable to owners of the parent	451	1,697	1,616	1,201	1,744	1,891				
YoY	-42.8%	-	-	1177.7%	286.7%	11.4%				
Net margin	0.8%	3.0%	3.2%	2.3%	3.0%	3.7%				

Source: Shared Research based on company data

Any differences between figures in the table and those in company data are due to rounding

## Revenue by segment

Revenue by segment(cumulative)		FY06/23				FY06/24			
(JPYmn)	Q1	Q1-Q2	Q1-Q3	Q1-Q4	Q1	Q1-Q2	Q1-Q3	Q1-Q4	
Solar Panel Manufacturing business	53,250	107,441	156,177	206,811	55,495	104,259			
YoY	619.8%	368.7%	215.0%	152.9%	4.2%	-3.0%			
% of revenue	95.9%	96.3%	96.0%	96.1%	96.1%	96.1%			
Green Energy business	2,126	3,907	6,228	8,002	2,066	3,947			
YoY	14.8%	18.2%	11.7%	-19.3%	-2.8%	1.0%			
% of revenue	3.8%	3.5%	3.8%	3.7%	3.6%	3.6%			
IT business	154	328	485	677	161	301			
YoY	-	-	-	131.8%	4.5%	-8.2%			
% of revenue	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%			
Photocatalyst business	10	18	29	40	9	19			
YoY	-58.3%	-67.3%	-59.2%	-50.0%	-10.0%	5.6%			
% of revenue	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
Reportable segments total	55,541	111,695	162,921	215,531	57,733	108,527			
YoY	498.2%	324.8%	194.8%	134.1%	3.9%	-2.8%			
% of revenue	100.0%	100.1%	100.1%	100.1%	100.0%	100.0%			
Other businesses and adjustments	5	-142	-228	-246	6	15			
YoY	-97.6%	-	-	-	20.0%	-			
% of revenue	0.0%	-	-	-	0.0%	0.0%			
Total	55,546	111,553	162,693	215,284	57,740	108,543			
YoY	485.2%	323.5%	194.0%	133.7%	3.9%	-2.7%			
Revenue by segment(By quarter)		FY06/23				FY06/24			
(JPYmn)	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
Solar Panel Manufacturing business	53,250	54,191	48,736	50,634	55,495	48,764			
YoY	619.8%	249.1%	82.8%	57.2%	4.2%	-10.0%			
% of revenue	95.9%	96.8%	95.3%	96.3%	96.1%	96.0%			
Green Energy business	2,126	1,781	2,321	1,774	2,066	1,881			
YoY	14.8%	22.6%	2.2%	-59.2%	-2.8%	5.6%			
% of revenue	3.8%	3.2%	4.5%	3.4%	3.6%	3.7%			
IT business	154	174	157	192	161	140			
YoY	-	-	503.8%	-23.8%	4.5%	-19.5%			
% of revenue	0.3%	0.3%	0.3%	0.4%	0.3%	0.3%			
Photocatalyst business	10	8	11	11	9	10			
YoY	-58.3%	-74.2%	-31.3%	22.2%	-10.0%	25.0%			
% of revenue	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
Reportable segments total	55,541	56,154	51,226	52,610	57,733	50,794			
YoY	498.2%	230.1%	76.8%	42.9%	3.9%	-9.5%			
% of revenue	100.0%	100.3%	100.2%	100.0%	100.0%	100.0%			
Other	5	-147	-86	-18	6	9			
YoY	-97.6%	-	-	-	20.0%	-			
% of revenue	0.0%	-	-	-	0.0%	0.0%			
Total	55,546	56,007	51,140	52,591	57,740	50,803			
YoY	485.2%	232.4%	76.4%	43.0%	3.9%	-9.3%			

Source: Shared Research based on company data

Any differences between figures in the table and those in company data are due to rounding



## Profit by segment

Profit by segment(cumulative) (JPYmm)	FY06/23				FY06/24			
	Q1	Q1-Q2	Q1-Q3	Q1-Q4	Q1	Q1-Q2	Q1-Q3	Q1-Q4
Solar Panel Manufacturing business	1,175	4,612	8,927	12,701	4,390	10,062		
YoY	-	-	-	925.9%	273.6%	118.2%		
% of total	78.0%	94.0%	96.9%	99.2%	93.7%	100.0%		
Segment profit margin	2.2%	4.3%	5.7%	6.1%	7.9%	9.7%		
Green Energy business	518	673	881	1,076	494	636		
YoY	29.2%	29.4%	30.5%	-3.2%	-4.6%	-5.5%		
% of total	34.4%	13.7%	9.6%	8.4%	10.5%	6.3%		
Segment profit margin	24.4%	17.2%	14.1%	13.4%	23.9%	16.1%		
IT business	1	11	17	47	21	20		
YoY	-	-	240.0%	571.4%	-	81.8%		
% of total	0.1%	0.2%	0.2%	0.4%	0.4%	0.2%		
Segment profit margin	0.6%	3.4%	3.5%	6.9%	13.0%	6.6%		
Photocatalyst business	-9	-23	-31	-40	-5	-10		
YoY	-	-	-	-	-	-		
% of total	-	-	-	-	-	-		
Segment profit margin	-	-	-	-	-	-		
Reportable segments total	1,685	5,274	9,794	13,785	4,901	10,708		
YoY	345.8%	600.4%	784.7%	488.9%	190.9%	103.0%		
% of total	111.9%	107.5%	106.3%	107.7%	104.6%	106.5%		
Segment profit margin	3.0%	4.7%	6.0%	6.4%	8.5%	9.9%		
Total	1,506	4,908	9,213	12,804	4,684	10,057		
YoY	492.9%	1030.9%	-	697.8%	211.0%	104.9%		
Operating profit margin	2.7%	4.4%	5.6%	5.9%	8.1%	9.3%		
Profit by segment(By quarter) (JPYmm)	FY06/23				FY06/24			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Solar Panel Manufacturing business	1,175	3,437	4,315	3,774	4,390	5,672		
YoY	-	-	-	366.5%	273.6%	65.0%		
% of total	78.0%	101.0%	100.2%	105.1%	93.7%	105.6%		
Segment profit margin	2.2%	6.3%	8.9%	7.5%	7.9%	11.6%		
Green Energy business	518	155	208	195	494	142		
YoY	29.2%	30.3%	34.2%	-55.4%	-4.6%	-8.4%		
% of total	34.4%	4.6%	4.8%	5.4%	10.5%	2.6%		
Segment profit margin	24.4%	8.7%	9.0%	11.0%	23.9%	7.5%		
IT business	1	10	6	30	21	-1		
YoY	-	-	20.0%	-	-	-		
% of total	0.1%	0.3%	0.1%	0.8%	0.4%	-		
Segment profit margin	0.6%	5.7%	3.8%	15.6%	13.0%	-		
Photocatalyst business	-9	-14	-8	-9	-5	-5		
YoY	-	-	-	-	-	-		
% of total	-	-	-	-	-	-		
Segment profit margin	-	-	-	-	-	-		
Reportable segments total	1,685	3,589	4,520	3,991	4,901	5,807		
YoY	345.8%	857.1%	-	223.4%	190.9%	61.8%		
% of total	111.9%	105.5%	105.0%	111.1%	104.6%	108.1%		
Segment profit margin	3.0%	6.4%	8.8%	7.6%	8.5%	11.4%		
Total	1,506	3,402	4,305	3,591	4,684	5,373		
YoY	492.9%	-	-	266.8%	211.0%	57.9%		
Operating profit margin	2.7%	6.1%	8.4%	6.8%	8.1%	10.6%		

Source: Shared Research based on company data

Any differences between figures in the table and those in company data are due to rounding

## 1H FY06/24 results

Revenue: JPY108.5bn (-2.7% YoY)

Operating profit: JPY10.1bn (+104.9% YoY)

OPM: 9.3% (4.4% in 1H FY06/23)

Recurring profit: JPY10.5bn (+87.6% YoY)

Net income attributable to owners of the parent: JPY3.6bn (+69.2% YoY)

Although revenue declined due to factors such as a drop in the unit price of solar panels, operating profit increased due to the operation of the cell plant and cost reductions resulting from the improved production efficiency at VSUN.

The company made corrections to its past financial figures, acknowledging that sales and profits related to solar panel transactions for solar power plants of WWB Corporation, a domestic consolidated subsidiary, had not been properly accounted for. The impact of these corrections resulted in a decrease of JPY2.1bn (1.0% of pre-correction revenue) and a decrease in operating profit by JPY760mn (5.6% of pre-correction operating profit) in FY06/23 results. All figures presented in this report are based on the revised amounts.

## Full-year forecast progress

The progress rate versus the full-year forecast was 43.1% for revenue, 63.7% for operating profit, 66.5% for recurring profit, and 51.9% for net income attributable to owners of the parent. The progress rate for revenue fell below 50% due to the drop in prices of solar panels. However, progress rates for profits were higher due to improvements in production efficiency. The company has not revised the full-year company forecast it announced in August 2023.

# Results in key reportable segments

## Solar Panel Manufacturing business

Revenue: JPY104.3bn (-3.0% YoY)

Segment profit: JPY10.1bn (+118.2% YoY)

Segment OPM: 9.7% (4.3% in 1H FY06/23)

Revenue decreased while profit increased. The solar panel market has become oversupplied globally due to increased production by Chinese companies, causing panel market prices to decline. Meanwhile, the US has continued its protectionist policies regarding solar panel-related products, imposing high tariffs on Chinese products in particular (such as anti-dumping duties, countervailing duties, and safeguard measures). As a result, the pricing of solar panels in the US market has been relatively stable compared to the global price decline. At the same time, the US has adopted tariff exemption measures for four Southeast Asian countries, including Vietnam, to meet robust domestic demand.

Consequently, products exported from VSUN's factory in Vietnam hold a competitive edge in the US market. VSUN has adopted Japanese production and quality management techniques and systems, expanding its business foundation through the sale of industrial and residential solar panels to Europe and the US. Particularly in North America, the company has business with long-standing, superior customers, with sales to North America accounting for about 90% (FY06/23) of total. As a result, although affected by price declines, the impact has been limited compared to the global downturn in prices.

Segment profit increased. With the stable operation of VSUN's panel (module) plant, production efficiency improved and costs in indirect departments were curtailed. Additionally, the completion of the cell (N-type TOPCon: Tunnel Oxide Passivated Contact, a cell technology) factory in October 2023 and in-house production of components previously purchased from other companies led to a reduction in purchase prices, contributing to the increase in profit.

## Green Energy business

Revenue: JPY3.9bn (+1.0% YoY)

Segment profit: JPY636mn (-5.5% YoY)

Segment OPM: 16.1% (17.2% in 1H FY06/23)

Revenue increased but profit decreased. Abalance operates a one-time revenue business and a recurring revenue business. The one-time revenue business, mainly operated by WWB Corporation and Valors Corporation, includes the sale of solar power plants, solar panels, PCS, industrial and residential storage batteries, and other goods. As a key initiative, Abalance is promoting the recurring revenue business, in which the company continues to own power plants even after the plants are completed, to establish a system to secure stable earnings from electricity sales. In order to accelerate the recurring revenue business, the company has promoted M&A with the aim of bulk purchasing solar power plants. Abalance has also entered the grid-scale battery business in the Hokkaido region, which enables stable power supply in times of high power demand or power outages.

In Q2, the one-time revenue business generated revenue of JPY1.81bn (-22.0% YoY), while the recurring revenue business revenue reached JPY2.14bn (+34.8% YoY). The recurring revenue business, which generates stable cash flows, grew, making up 54.1% of total revenue (40.6% in Q2 FY06/23).

## Equity ratio

The equity ratio was 10.6%, nearly unchanged from 8.8% as of end-FY06/23. Total assets decreased mainly due to liabilities, while equity increased due to the accumulation of retained earnings. The company set a target equity ratio of above 10% to 12%, and to ensure financial soundness, intends to strengthen its equity by increasing retained earnings, particularly in the Solar Panel Manufacturing and Green Energy businesses.

## Capital investment plan

Subsidiary Cell Company has been engaged in the construction of a cell plant that will have an overall capacity of 8GW per year (investment amount: approximately USD300mn), with Phase 1 of this project (4GW annual production capacity; investment amount: approximately USD180mn) completed in late October 2023. The company aims to stabilize parts procurement, vertically strengthen upstream supply chains, and respond flexibly to import regulations in each country, while also making efforts to gradually increase profit margins by reducing costs through the in-house production of key components. The company anticipates an increase in revenue as it plans to sell cells to external parties in the future.

The company is currently evaluating the situation after the operation of Phase 1 and considering the implementation of investments in Phase 2. In addition, in order to improve competitiveness in the medium term, the company plans to shift from external procurement of key components of solar panels (cells, wafers, ingots) to in-house production. It aims to enhance competitiveness by establishing a global supply chain.

## Fundraising

Cell Company is currently making preparations to list on the US NASDAQ stock exchange, in partnership with Blue World Acquisition Corporation (BWAQ), a special purpose acquisition company also listed on NASDAQ. Furthermore, a press release from Abalance dated March 28, 2024, revealed that TOYO Co., Ltd. (TOYO Co), the parent company of Cell Company, has verified the effectiveness of the Form F-4 registration statement filed with the US Securities and Exchange Commission (SEC) in accordance with the Securities Act of the United States.

# Full-year company forecast

## Full-year company forecast

(JPYmn)	FY06/22			FY06/23			FY06/24		
	1H results	2H results	FY results	1H results	2H results	FY results	1H results	2H forecast	FY forecast
Revenue	26,342	65,780	92,122	111,553	103,731	215,284	108,543	143,257	251,800
YoY	127.6%	329.2%	242.4%	323.5%	57.7%	133.7%	-2.7%	38.1%	17.0%
Operating profit	434	1,171	1,605	4,908	7,896	12,804	10,057	5,743	15,800
YoY	-48.7%	127.0%	17.9%	-	574.3%	697.8%	104.9%	-27.3%	23.4%
Operating profit margin	1.6%	1.8%	1.7%	4.4%	7.6%	5.9%	9.3%	4.0%	6.3%
Recurring profit	241	1,177	1,418	5,602	8,436	14,038	10,507	5,293	15,800
YoY	-72.7%	203.7%	11.7%	2224.5%	616.7%	890.0%	87.6%	-37.3%	12.6%
Recurring profit margin	0.9%	1.8%	1.5%	5.0%	8.1%	6.5%	9.7%	3.7%	6.3%
Net income attributable to owners of the parent	739	67	806	2,148	2,817	4,965	3,635	3,365	7,000
YoY	112.0%	-64.4%	50.1%	190.7%	-	516.0%	69.2%	19.5%	41.0%
Net margin	2.8%	0.1%	0.9%	1.9%	2.7%	2.3%	3.3%	2.3%	2.8%

Source: Shared Research based on company data

Any differences between figures in the table and those in company data are due to rounding

The company made no change to the FY06/24 full-year company forecast announced in August 2023. The forecast calls for revenue of JPY251.8bn (+17.0% YoY), operating profit of JPY15.8bn (+23.4% YoY), recurring profit of JPY15.8bn (+12.6% YoY), and net income attributable to owners of the parent of JPY7.0bn (+41.0% YoY).

Despite a decrease in solar panel prices, the company intends to begin selling to external customers cells manufactured in the cell factory that commenced operations in October 2023, and hence maintained its revenue forecast unchanged. Even though operating profit amounted to 63.7% of the full-year forecast in Q2, the company indicated that it would only consider adjustments after carefully observing trends in solar panel prices and foreign exchange rates.

# Medium-term management plan

## Medium-term management plan

In September 2023, Abalance formulated a new medium-term management plan covering three years from FY06/24 to FY06/26. The company aims to become a global core renewable energy company by 2030, focusing on building the Solar Panel Manufacturing and Green Energy businesses as growth engines to achieve sustainable growth and maximize corporate value. This medium term management plan is positioned as an acceleration period to realize this goal.

### Resetting business targets for core businesses by 2030

The company reset its business targets for 2030 in conjunction with the formulation of a new medium-term management plan. The previous business targets were 1GW of output capacity for domestic and overseas proprietary power plants in the Green Energy business, 8GW of annual solar panel manufacturing capacity and 6GW of annual cell production capacity in the Solar Panel Manufacturing business. The company maintained the 1GW of output capacity for power plants in Japan and overseas, but raised the annual production targets for solar panels and cells to 12GW and 16GW, respectively. Additionally, the company started production of wafers and ingots, with an annual production capacity of 8GW.

To realize medium- to long-term enhancement of corporate value, the company will practice corporate management with an awareness of ROIC and cost of capital as management controls (KPIs), and aims to achieve fiscal year targets with operating profit as the KPI. Further, from the perspective of sound corporate growth, the company will strive to increase the equity ratio.

Annual production capacity	FY06/23	FY06/26	FY06/31
GW	Results	Company forecast	Company forecast
Solar panel		5	10
Solar cell	0 (See note)	10	16
Wafer and ingot		0	4

Source: Shared Research based on company materials

Note: The construction of the cell plant with a 4GW capacity was completed in late October 2023.

## New medium-term management plan numerical targets

The target value for FY06/24 is unchanged, but for FY06/25 and FY06/26, the company expects revenue and all profit items including operating profit to increase, and OPM and equity ratio to rise. For FY06/26, the final year of the plan, the company forecasts revenue of JPY355.8bn, operating profit of JPY30.8bn, and OPM of 8.7%. CAGR during the plan period is 18.2% for revenue, 34.0% for operating profit, and 29.9% for recurring profit. During the plan period, revenue will increase by around JPY50.0bn each fiscal year, with operating profit doubling from JPY15.8bn in FY06/24, to JPY30.8bn in FY06/26.

## Medium-term management plan (September 2023)

(JPYmn)	FY06/23	FY06/24 (Company forecast)				FY06/25 (Company forecast)				FY06/26 (Company forecast)				CAGR
	Results	YoY	YoY change	% of total	YoY	YoY change	% of total	YoY	YoY change	% of total	YoY	YoY change	% of total	
Revenue	215,284	251,800	17.0%	36,516	100.0%	301,800	19.9%	50,000	100.0%	355,800	17.9%	54,000	100.0%	18.2%
Solar Panel Manufacturing business	206,811	239,000	15.6%	32,189	94.9%	287,000	20.1%	48,000	95.1%	338,000	17.8%	51,000	95.0%	17.8%
Domestic business(one-time revenue)	5,270	7,800	48.0%	2,530	3.1%	8,800	12.8%	1,000	2.9%	9,800	11.4%	1,000	2.8%	23.0%
Domestic business(recurring revenue)	3,200	5,000	56.3%	1,800	2.0%	6,000	20.0%	1,000	2.0%	8,000	33.3%	2,000	2.2%	35.7%
Operating profit	12,804	15,800	23.4%	2,996	6.3%	25,800	63.3%	10,000	8.5%	30,800	19.4%	5,000	8.7%	34.0%
Recurring profit	14,038	15,800	12.6%	1,762	6.3%	25,800	63.3%	10,000	8.5%	30,800	19.4%	5,000	8.7%	29.9%
Net income attributable to owners of the parent	4,965	7,000	41.0%	2,035	2.8%	-	-	-	-	-	-	-	-	-
Equity ratio	8.8%									20.0%				

Source: Shared Research based on company data.

Notes: The domestic business (one-time revenue) includes revenue from power plant sales and goods (such as panels and batteries) by domestic group companies, as well as sales in the IT and Photocatalyst businesses. The domestic business (recurring revenue) includes revenue from electricity sales in the Green Energy business and stable revenue from operation and maintenance (O&M), and other revenue streams that form the source of cash flow.

The unit price of solar panels is at risk of falling below the planned value if there is a global decline in panel prices, which would cause a drop in sales prices.

The assumed exchange rate is JPY130–JPY135/USD.

The fourth solar panel plant is expected to gradually improve its utilization rate in line with the progress of in-house production of cells, which are key components.

As for the impact of additional tariff measures on solar power generation products (cells and panels) in the US, the company has not factored it in at this point in time as the company has not been designated as subject companies, and it is difficult to foresee sufficiently.

The company also published the planned figures for VSUN, which are the basis for its forecasts. It expects revenue to increase in line with expanded panel manufacturing capacity, which is expected to drive revenue higher in the US, European, and other markets. Operating profit is expected to increase from JPY12.7bn in FY06/23 to JPY29.8bn in FY06/26. CAGR for revenue and operating profit during the plan period is 17.8% and 32.9%, respectively. OPM is expected to rise from 6.1% in FY06/23 to 8.8% in FY06/26. The increase in operating profit is expected to be driven by higher revenue, lower parts procurement costs, cost reductions in line with cell plant completion, and improvements in utilization rates leading to lower costs.

The company plans to expand its annual manufacturing capacity for solar panels and cells to 10GW each by FY06/26, with 4GW planned for the start of wafer and ingot production. The company intends to increase capital expenditure from USD70mn in FY06/23 to USD200mn in FY06/26, assuming investments in panel manufacturing facilities and cells mainly in Vietnam and the US.

## Target figures for VSUN

(JPYmn)	FY06/23	FY06/24 (Company forecast)				FY06/25 (Company forecast)				FY06/26 (Company forecast)				CAGR
	Results	YoY	YoY change	% of total	YoY	YoY change	% of total	YoY	YoY change	% of total	YoY	YoY change	% of total	
Revenue	206,811	239,000	15.6%	32,189	100.0%	287,000	20.1%	48,000	100.0%	338,000	17.8%	51,000	100.0%	17.8%
Operating profit	12,700	15,000	18.1%	2,300	6.3%	25,000	66.7%	10,000	8.7%	29,800	19.2%	4,800	8.8%	32.9%
Annual solar panel manufacturing capacity(GW)	5	-	-	-	-	-	-	-	-	10	-	-	-	26.0%
Capex(USDmn)	70	-	-	-	-	-	-	-	-	200	-	-	-	41.9%

Source: Shared Research based on company materials

Note: Annual solar panel manufacturing capacity and capex for FY06/26 include panel manufacturing in Vietnam and the US.

## Growth strategy

### Green Energy business

In the Green Energy business, Abalance operates a one-time revenue business and a recurring revenue business. While the one-time revenue business includes the sale of solar power plants, solar panels, PCS, industrial and residential storage batteries, and other goods, the recurring revenue business generates stable earnings such as electricity sales from solar and wind power plants and O&M. The company owns about 110 proprietary plants both in Japan and overseas, with the total output capacity over 140MW (including projects under development or to be acquired), and the company plans to expand this to 1GW.

To advance its recurring revenue business, the company is considering M&A of renewable energy-related companies, establishing business alliances and strategic partnerships with major corporations and general trading companies, and expanding joint ventures for domestic and overseas projects. As a new business, Abalance will enter the battery storage business and promote self-consumption projects (non-FIT, non-farm) and solar sharing as a PPA operator. It will also promote the development of hydrogen products and businesses to advance the green transformation.

To accelerate its growth strategy, in June 2023, Abalance entered into an outsourcing agreement with Yamada Trading Co., Ltd. (a subsidiary of Yamada Holdings [TSE Prime: 9831]) for the sale of solar power storage batteries for households. Additionally, in August 2023, the company signed a memorandum of understanding with Mitsui & Co. Plant Systems, Ltd. (a subsidiary of Mitsui & Co., Ltd. [TSE Prime: 8031]) for the joint development of an offsite corporate PPA solar power generation project.

### Solar Panel Manufacturing business

In the Solar Panel Manufacturing business, in addition to expanding the production capacity of VSUN solar panel manufacturing and cell plants, the company will begin manufacturing wafers and ingots.

In terms of annual production capacity, solar panels will be expanded from 5GW in FY06/23 to 10GW in FY06/26, and cells expanded to 10GW in FY06/26. In addition to manufacturing in Vietnam, the company is considering panel manufacturing in the US. This will not only strengthen the company's global supply chain but also improve its ability to respond to import restrictions in various countries. Given the continued expansion of panel demand in the US market and the encouragement of domestic production by the US government, the company has already started considering constructing a new solar panel factory, including scouting for potential construction sites, with an eye to investing in the US market.

### VSUN group IPO strategies

In August 2023, VSUN's subsidiary, Vietnam Sunergy Cell Company Limited (hereinafter, Cell Company), concluded a basic agreement with BLUE WORLD ACQUISITION, a special purpose acquisition company (SPAC) listed on the NASDAQ in the US whereby Cell Company, through BWAQ, will effectively list on the NASDAQ. This requires approval from BWAQ shareholders and the US Securities and Exchange Commission (SEC), as well as compliance with various laws and regulations in each country, by February 2024. The funds raised are being considered for allocation to the construction of a Cell Company cell plant and factory in the US. A press release from Abalance dated March 28, 2024, revealed that TOYO Co, the parent company of Cell Company, has verified the effectiveness of the Form F-4 registration statement filed with the US Securities and Exchange Commission (SEC) in accordance with the Securities Act of the United States.

### Strengthening management control for enhancing corporate value

The company aims to enhance corporate value through management that prioritizes return on invested capital (ROIC) and capital cost as management indicators. The company aims to achieve the annual targets presented in the new medium-term management plan using operating profit as a KPI. In addition, in order to improve corporate value and creditworthiness, the company is striving to increase its equity while maintaining an optimal capital structure. The company aims to increase the equity ratio from 8.8% in FY06/23 to over 10% to 12% in FY06/24 and up to 20% in FY06/26.

# Business

## Business overview

The Abalance group comprises the parent company Abalance, consolidated subsidiaries, and affiliates. As a holding company, Abalance oversees and controls group management, while subsidiaries handle business operations. Key consolidated subsidiaries include WWB Corporation (unlisted) and Valors Corporation (unlisted) both in the Green Energy business, and Vietnam Sunergy Joint Stock Company (VSUN; unlisted) in the Solar Panel Manufacturing business.

### Main consolidated subsidiaries (end-June 2023)

Name	Location	Paid-in capital/capital contributions(JPYmn)	Primary business	% of voting rights/stake(%)	Relationship with Abalance
1 WWB Corporation	Tokyo	100	Green Energy business, Other businesses	100	Three concurrently serving officer
2 Valors Corporation	Osaka	100	Green Energy business	99.9	Two concurrently serving officers
3 FUJI Solar Corporation	Tokyo	1	Solar Panel Manufacturing business	51	One concurrently serving officer
4 Kakuda Electric Fuel Development Silent Partnership	Miyagi Pref.	610	Green Energy business	100	
5 Japan Photocatalyst Center Corporation	Saga Pref.	100	Photocatalyst business	93.3	Financial support. One concurrently serving officer
6 Abit Corporation	Tokyo	100	IT business	100	One concurrently serving officer
7 Vietnam Sunergy Joint Stock Company	Vietnam	VND608.6bn	Solar Panel Manufacturing business	43.2	One concurrently serving officer

Source: Shared Research based on company data

\*VND (Vietnamese dong; JPY0.0061/VND at end-June 2023)

The company's reportable segments are classified by business areas: namely Green Energy, Solar Panel Manufacturing, Photocatalyst, and IT. In addition, the company engages in businesses such as the purchase, sale, and rental of construction machinery under Other businesses.

- ▶ Green Energy business: Purchase/sale (trades) of solar power plants, sale of solar panels and related goods (one-time revenue businesses), and power plant construction work, sale of electricity generated via solar and wind power systems (recurring revenue businesses)
- ▶ Solar Panel Manufacturing business: Manufacture and sale of solar panels
- ▶ IT business: Introduction of company's mainstay products to new customers, sale of software licenses, systems development on contract, operation and maintenance work
- ▶ Photocatalyst business: Manufacture and sale of titanium coating agents and products utilizing such agents

Abalance's mainstay businesses are Solar Panel Manufacturing and Green Energy, each accounting for 96.1% and 3.7% of consolidated revenue in FY06/23, respectively. Solar Panel Manufacturing made up 92.1% of operating profit before adjustments and inclusion of Other businesses, while Green Energy accounted for 7.8%. Among the reportable segments, segment profit margin was highest in Green Energy at 13.4% whereas Solar Panel Manufacturing was lowest at 6.1%. By region, North America accounted for 86.7% of consolidated revenue, followed by Japan at 4.0%, Europe at 4.9%, and other regions at 3.9%.

## Revenue and segment profit compositions by reportable segment

% of revenue(JPYmn)	FY06/23				
	Revenue		Segment profit		Segment profit margin
		% of total		% of total	
Reportable segment					
Solar Panel Manufacturing business	206,811	96.1%	12,701	92.1%	6.1%
Green Energy business	8,002	3.7%	1,076	7.8%	13.4%
IT business	677	0.3%	47	0.3%	6.9%
Photocatalyst business	40	0.02%	-40	-0.3%	-
Reportable segments total	215,531	100.1%	13,785	100.0%	6.4%
Other	75	0.03%	-120	-0.9%	-
Adjustments	-321	-0.1%	-860	-6.2%	-
Total	215,284	100.0%	12,804	92.9%	5.9%

Source: Shared Research based on company data

## Revenue composition by region

Revenue composition by region(JPYmn)	FY06/22		FY06/23	
	Revenue	% of total	Revenue	% of total
Japan	10,792	11.7%	8,605	4.0%
Asia	1,526	1.7%	1,051	0.5%
North America	68,185	74.0%	186,684	86.7%
Europe	3,719	4.0%	10,527	4.9%
Other	7,898	8.6%	8,416	3.9%
Total	92,122	100.0%	215,284	100.0%

Source: Shared Research based on company data

# Business overview by reportable segment

## Solar Panel Manufacturing business (96.1% of consolidated revenue in FY06/23)

Vietnam Sunergy Joint Stock Company (VSUN), is a holding company whose subsidiaries manufacture and sell solar panels (the holding company and its subsidiaries are collectively referred to as VSUN in this report). VSUN procures raw materials from Europe, the US, and Asia, manufactures solar panels at its plants in Vietnam, and sells them overseas, mainly to the US and Europe directly or through overseas branches with sales branch functions.

While the top positions in the global solar panel manufacturer rankings are dominated by Chinese companies, VSUN maintains the largest production volume among the Japanese players.

### Overview of VSUN

VSUN, headquartered in the Bac Giang Province of Northeast Vietnam, is a solar panel manufacturing and sales company founded in June 2015. In December 2020, Abalance acquired additional shares in Fuji Solar Corporation (unlisted), which was an affiliate of WWB and a shareholder of VSUN, and made Fuji Solar a consolidated subsidiary (the company held approximately 43.2% of voting rights at end-June 2023). At the time of the consolidation, VSUN's revenue was more than three times that of the Abalance group in FY06/21.

### Production capacity

VSUN has plants in Vietnam (in the Bac Giang and Bac Ninh Provinces) dedicated to the manufacture of solar panels. At end-FY06/26, annual production capacity expanded to a total of 5GW with the July 2021 commencement of operations at the third plant (annual production capacity of 1GW; capital expenditure of USD12mn), and the fourth plant (2.4GW; approximately USD30mn) in January 2023. Under the medium-term management plan through FY06/26, the company looks to expand production capacity of its plants to 10GW. Further, construction of solar cell plants with an annual production capacity of 8GW (total investment of roughly USD300mn) is also under way as the company plans to make a shift from external procurement to in-house manufacture of solar cells—a key component in solar panel manufacturing. The first phase of the project, which is the construction of a cell plant with an annual production capacity of 4GW (total investment of roughly USD180mn), was completed in late October 2023. In addition, in the first half of 2024, a new plant for the production of wafers and ingots is scheduled to start operation (annual manufacturing capacity of 4GW).

Electrical power is measured in terms of watts: one gigawatt (GW) equals one thousand megawatts (MW), which equals one million kilowatts (kW), or one billion watts (W). A typical reactor at a nuclear power plant can produce around one gigawatt of electricity, enough to power roughly 300,000 homes. Kilowatt hour (kWh) refers to the measure of energy equivalent to the expenditure of one kilowatt (1kW=1,000W) for one hour.

## Production plants



Source: Company materials

Note: Panel factory (left); cell plant (right)

### Solar panel manufacturing processes

The main manufacturing processes for solar panels begin with the creation of a silicon block called ingot. The ingot is then sliced to make silicon wafers, which are subsequently formed into solar cells. Multiple solar cells are then assembled to make solar panels (also referred to as solar modules). In addition to solar panel production, which is the final step in the process, VSUN also began producing cells with the completion of a cell plant in late October 2023.

### VSUN's solar panels

Although VSUN's production scale is still small compared to major manufacturers, it is top among Japanese manufacturers, gaining recognition from third-party organizations not only for the quality, reliability, and functionality of its solar panels, but also in terms of its procurement standards. It has also cleared the strict quality standards of major purchasers such as French petroleum company TotalEnergies SE (NYSE: TTE; Euronext: TTE) and French energy and gas company Engie SA (Euronext: ENGI).

From 2021 to 2023, VSUN was selected as a "Top Performer" in the PV Module Reliability Scorecard (released by US-based PV Evolution Labs [PVEL]) for three consecutive years. Also, in an assessment conducted by EcoVadis—a global rating agency based in France that assesses companies' sustainable sourcing including their action toward human rights issues, VSUN was awarded a Bronze Medal for the second consecutive year since 2021.

The PV Module Reliability Scorecard is a report released since 2012 by US-based independent organization PV Evolution Labs (PVEL), which tests the reliability and performance of solar panels. The report outlines the results of tests conducted by PVEL annually under its product certification program, based on which the brands producing solar panels of superior reliability and durability are certified as Top Performers. (<https://modulescorecard.pvel.com/top-performers/>).

EcoVadis is a global third-party organization that comprehensively evaluates the CSR activities and sustainability of companies with global supply chains in the four areas of the environment, labor and human rights, ethics, and sustainable procurement. Supply chains rated above a certain level in this assessment are socially recognized as being free of particular risks, and in recent years the results of the assessment have been widely used in the United States, Europe, and Japan.

Abalance has been disclosing the key financial information on VSUN (a specified subsidiary) in its annual securities report since FY06/21. In FY06/23, VSUN's revenue accounted for 96.1% of Abalance's consolidated revenue and 98.9% of recurring profit, with revenue of JPY206.8bn (+206.7% YoY) and recurring profit of JPY13.9bn (+961.9% YoY). RPM increased from 1.9% in FY06/22 to 6.7% in FY06/23.



## VSUN: Key financials

Vietnam Sunergy Joint Stock Company (JPYmn)	FY06/14	FY06/15	FY06/16	FY06/17	FY06/18	FY06/19	FY06/20	FY06/21	FY06/22	FY06/23
	Cons.	Cons.	Cons.	Cons.	Cons.	Cons.	Cons.	Cons.	Cons.	Cons.
<b>Revenue</b>								21,013	67,429	206,811
YoY	-	-	-	-	-	-	-	-	220.9%	206.7%
% of consolidated revenue	-	-	-	-	-	-	-	78.1%	73.2%	96.1%
<b>Recurring profit</b>								785	1,307	13,879
YoY	-	-	-	-	-	-	-	-	66.5%	961.9%
Recurring profit margin	-	-	-	-	-	-	-	3.7%	1.9%	6.7%
% of consolidated recurring revenue	-	-	-	-	-	-	-	61.9%	92.2%	98.9%
<b>Net income</b>								718	1,213	12,208
YoY	-	-	-	-	-	-	-	-	68.9%	906.4%
Net margin	-	-	-	-	-	-	-	3.4%	1.8%	5.9%
% of consolidated net income	-	-	-	-	-	-	-	77.1%	77.9%	102.3%
<b>Net assets</b>								2,762	5,222	18,217
YoY	-	-	-	-	-	-	-	-	89.1%	248.9%
% of consolidated net assets	-	-	-	-	-	-	-	57.8%	65.7%	80.0%
<b>Total assets</b>								16,894	44,967	104,666
YoY	-	-	-	-	-	-	-	-	166.2%	132.8%
% of consolidated total assets	-	-	-	-	-	-	-	42.9%	52.8%	72.8%
Equity ratio	-	-	-	-	-	-	-	16.3%	11.6%	17.4%
ROE(Net income)	-	-	-	-	-	-	-	26.0%	23.2%	67.0%
ROA (Net income)	-	-	-	-	-	-	-	4.3%	2.7%	11.7%

Source: Shared Research based on company data

## Green Energy business (3.7% of consolidated revenue in FY06/23)

In this business, the company trades solar power plants, sells solar panels and related products, owns power plants, and also engages in the development, construction, operation, and maintenance work associated with solar plants. WWB, Valors, and other consolidated subsidiaries and equity-method affiliates are charged with the actual business operations. The Green Energy segment further breaks down into the one-time revenue business and the recurring revenue business, each accounting for 60.1% and 39.9% of segment revenue in FY06/23, respectively.

### Recurring revenue business

In this business, the company uses the solar power plants under its ownership to generate electricity, which it sells to power utilities. The company either develops these facilities on its own or acquires them from other parties through M&A. The electricity being sold mainly falls under the feed-in tariff (FIT) scheme (see below for details). In August 2023, the company, WWB, and Mitsui & Co. Plant Systems Ltd. (unlisted, wholly owned subsidiary of Mitsui & Co., Ltd. PRM 8031) signed an MOU for the joint development of an offsite corporate PPA-type solar power generation project and agreed to study the project with the aim of realizing a decarbonized society, and intends to focus on PPA.

#### Solar power plants in operation

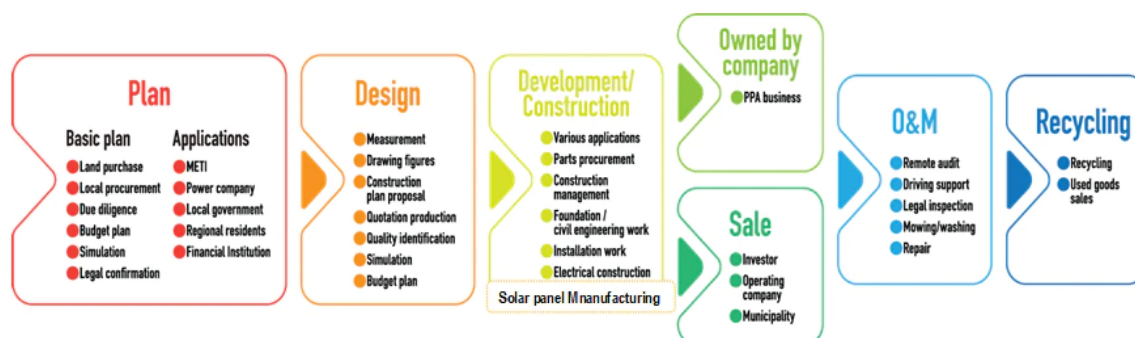
The company's solar power plants currently in operation include those developed in-house and those acquired through M&A. With over 110 power plants, primarily in Japan, the total output capacity comes to over 140MW. The Abalance group seeks to increase this capacity to 1GW by 2030, using proprietary power plants in Japan and overseas.

The company has so far focused on the ownership of power plants that utilized the FIT scheme, but will also focus efforts on feed-in premium (FIP) schemes, self-consumption, and other non-FIT projects.

### One-time revenue business

In this business, the company trades a wide range of power generation facilities (home-use, industrial, pre-used, and other) and sells goods associated with power generation equipment. It also offers end-to-end solar energy solutions to companies and households through direct sales, agents, and other channels.

## End-to-end services



Source: Shared Research based on company data

## Customers

Customers in the Green Energy recurring revenue business are the buyers of electricity generated by the company's power plants. For power plants operating under the FIT scheme, they are power utilities. In the one-time revenue business, investors are the primary counterparts in power plant trades. Companies and consumers are the customers for solar panel products, which the company sells directly and through distributors.

VSUN sells industrial and home-use solar panels to Solar Panel Manufacturing customers mainly in the US, Europe, and other countries.

## Sales channels

Sales in the Green Energy recurring revenue business is mainly handled by WWB. In the one-time revenue business, the company engages in power plant trades, sells power generation facility-related products, and provides end-to-end solutions from power plant planning to operation and maintenance, mainly through direct sales using the distributors/agents of WWB and Valors.

In the Solar Panel Manufacturing business, industrial and home-use solar panels are sold to the US, Europe, and other regions directly from VSUN or through overseas branches. VSUN has sales companies in the US, Germany, and China.

# Earnings structure

## Revenue

In the Green Energy recurring revenue business, the company generates revenue from its solar power plants operating under the FIT scheme. Here, revenue is a function of power generation income per kWh and the volume of electricity sold. The company does not disclose the amount of electricity it sells. The one-time revenue business comprises mainly total product sales related to solar power generation in the Green Energy business. A simple division of FY06/23 revenue in the recurring revenue business by 140MW (total output capacity of the company's power plants) yielded roughly JPY23,000 per kW (Shared Research estimated value).

Revenue in the Solar Panel Manufacturing business is a function of the unit price of solar panels and the sales volume, but the company does not disclose figures such as its solar panel shipment volume. To calculate a unit price for the company's solar panel, we simply divided the FY06/23 revenue in this segment by 5.0GW, which was VSUN's production capacity in the same period, and arrived at approximately JPY41,000 per kW (Shared Research estimated value).

## Revenue trends

By reportable segment, in FY06/14, Construction Machinery Sales accounted for 22.1% of revenue, IT business 7.7%, and Green Energy business (Solar Power Generation business until FY06/17) 70.2%. With the expansion of the Green Energy business from FY06/17, its revenue mix grew to 86.8%. In FY06/21, the Solar Panel Manufacturing and Photocatalyst businesses—formerly under Other businesses—were reclassified and added as a new reportable segment in line with the conversion of VSUN to a consolidated subsidiary, thereby arriving at the current four reportable segments. The Construction Machinery Sales business was reclassified to Other businesses in FY06/21.

## Revenue by segment

Revenue by segment (JPYmm)	FY06/14	FY06/15	FY06/16	FY06/17	FY06/18	FY06/19	FY06/20	FY06/21	FY06/22	FY06/23
	Cons.	Cons.	Cons.	Cons.	Cons.	Cons.	Cons.	Cons.	Cons.	Cons.
Solar Panel Manufacturing business								21,013	81,775	206,811
YoY	-	-	-	-	-	-	-	-	289.2%	152.9%
% of revenue	-	-	-	-	-	-	-	78.1%	88.8%	96.1%
Green Energy business	2,349	3,455	3,940	5,636	6,513	5,178	6,248	5,311	9,921	8,002
YoY	93.7%	47.1%	14.0%	43.0%	15.6%	-20.5%	20.7%	-15.0%	86.8%	-19.3%
% of revenue	70.2%	78.6%	86.8%	86.8%	89.2%	86.5%	93.6%	19.7%	10.8%	3.7%
IT business	259	153	90	101	81	172	58	61	292	677
YoY	-27.2%	-40.9%	-41.3%	12.3%	-19.5%	111.7%	-66.3%	5.2%	378.7%	131.8%
% of revenue	7.7%	3.5%	2.0%	1.6%	1.1%	2.9%	0.9%	0.2%	0.3%	0.3%
Photocatalyst business								112	177	80
YoY	-	-	-	-	-	-	-	58.0%	-54.8%	-50.0%
% of revenue	-	-	-	-	-	-	-	1.7%	0.7%	0.0%
Construction Machinery Sales business	738	788	510	758	706	596				
YoY	0.5%	6.8%	-35.3%	48.7%	-6.9%	-15.6%	-	-	-	-
% of revenue	22.1%	17.9%	11.2%	11.7%	9.7%	10.0%	-	-	-	-
Reportable segments total	3,347	4,396	4,540	6,495	7,301	5,946	6,565	26,563	92,070	215,531
YoY	45.3%	31.4%	3.3%	43.1%	12.4%	-18.6%	10.4%	304.6%	246.6%	134.1%
% of revenue	100.0%	100.0%	100.0%	100.0%	100.0%	99.4%	98.3%	98.7%	99.9%	100.1%
Other businesses and adjustments	0	0	0	0	0	39	257	339	52	-246
YoY	-	-	-	-	-	-	561.2%	31.9%	-84.7%	-
% of revenue	-	-	-	-	-	0.6%	3.8%	1.3%	0.1%	-
Total	3,347	4,396	4,540	6,495	7,301	5,985	6,678	26,901	92,122	215,284
YoY	45.3%	31.4%	3.3%	43.1%	12.4%	-18.0%	11.6%	302.8%	242.4%	133.7%

Source: Shared Research based on company data

Note: The Green Energy business was referred to as the Solar Power Generation business through FY06/17; same hereinafter

Any differences between figures in the table and those in company data are due to rounding

By region, sales to the US expanded; Shared Research attributes this to the shift in US energy policies with the inauguration of the Biden administration, and a strong move toward reevaluation of supply chains due to heightened geopolitical risks.

### US tariff exemptions for solar power-related imports from Southeast Asia

In June 2022, President Biden declared a state of emergency regarding the shortage of solar cells and panels, and issued a presidential proclamation instructing the Secretary of Commerce to take appropriate measures. These included tariff exemptions for imports of solar power-related products from Cambodia, Malaysia, Thailand, and Vietnam for a maximum period of 24 months ("Declaration of Emergency and Authorization for Temporary Extensions of Time and Duty-Free Importation of Solar Cells and Modules from Southeast Asia").

The proclamation spoke of the solar panel bottleneck emerging in the US. The majority of solar modules installed in the US are imported, and in 2020, three-quarters of these imports came from Southeast Asia. That said, due to increasing demand for solar power generation driven by the climate change, carbon neutrality efforts, and rising energy prices, the current level of panel imports no longer satisfies the growing demand in the US.

In August 2023, the US Department of Commerce issued its final decision that several solar product manufacturers with Chinese origins were circumventing the Anti-Dumping Duties (AD) and Countervailing Duties (CVD) placed on Chinese solar products (cells and modules) by routing their products through four Southeast Asian countries (Cambodia, Malaysia, Thailand, Vietnam) before exporting them to the US (if conditions are met, the products are not subject to tax until June 2024). VSUN is neither recognized as a circumventing nor as a non-circumventing company, and under US related laws and regulations, if evidence is found that products are completed or assembled in a third country with the intention to evade AD or CVD, the US Department of Commerce may conduct an investigation.

## Cost of revenue

The company had maintained a cost ratio of 80% or lower through FY06/20, prior to the conversion of VSUN to a consolidated subsidiary. However, this figure rose to over 80.0% in FY06/21. Shared Research SR understands that cost of revenue includes solar panel costs and the sales costs of solar power generation-related products in the Green Energy business. Although the company sources many materials from Europe, the US, and Asia, it is looking to stabilize procurement by also purchasing from other Asian countries and producing cells in-house.

Income statement	FY06/14	FY06/15	FY06/16	FY06/17	FY06/18	FY06/19	FY06/20	FY06/21	FY06/22	FY06/23
(JPYmn)	Cons.	Cons.	Cons.	Cons.	Cons.	Cons.	Cons.	Cons.	Cons.	Cons.
Revenue	3,347	4,396	4,540	6,495	7,301	5,985	6,678	26,901	92,122	215,284
YoY	45.3%	31.4%	3.3%	43.1%	12.4%	-18.0%	11.6%	302.8%	242.4%	133.7%
Cost of revenue	2,609	3,315	3,432	5,006	5,123	4,112	4,916	22,112	82,508	185,663
YoY	56.9%	27.1%	3.5%	45.9%	2.3%	-19.7%	19.6%	349.8%	273.1%	125.0%
Cost ratio	78.0%	75.4%	75.6%	77.1%	70.2%	68.7%	73.6%	82.2%	89.6%	86.2%
Gross profit	738	1,081	1,108	1,489	2,178	1,873	1,762	4,788	9,613	29,621
YoY	15.1%	46.5%	2.5%	34.4%	46.3%	-14.0%	-5.9%	171.7%	100.8%	208.1%
Gross profit margin	22.0%	24.6%	24.4%	22.9%	29.8%	31.3%	26.4%	17.8%	10.4%	13.8%

Source: Shared Research based on company data

Any differences between figures in the table and those in company data are due to rounding

## SG&A expenses

The SG&A ratio, which trended around 20% from FY06/17 to FY06/20, fell to 12.7% in FY06/21, and has been below 10% since FY06/22. Of the SG&A expenses in FY06/23, container freight costs and commission expenses made up the largest share at 3.5% of the total, followed by salaries, allowances, and bonuses at 1.1%, and depreciation at 0.2%. Other expenses also constituted a large portion of total SG&A expenses at 2.7%, including customs duties paid by VSUN when exporting solar panels.

SG&A expenses	FY06/14	FY06/15	FY06/16	FY06/17	FY06/18	FY06/19	FY06/20	FY06/21	FY06/22	FY06/23
(JPYmn)	Cons.	Cons.	Cons.	Cons.	Cons.	Cons.	Cons.	Cons.	Cons.	Cons.
SG&A expenses	474	660	710	1,374	1,251	1,265	1,400	3,427	8,007	16,816
YoY	8.9%	39.3%	7.6%	93.3%	-8.9%	1.1%	10.7%	144.7%	133.6%	110.0%
SG&A ratio	14.2%	15.0%	15.6%	21.1%	17.1%	21.1%	21.0%	12.7%	8.7%	7.7%
Commission expenses	72	103	129	327	221	256	229	492	1,640	7,626
YoY	3.7%	43.2%	25.5%	153.7%	-32.4%	15.7%	-10.5%	114.7%	233.3%	365.0%
% of revenue	2.1%	2.3%	2.8%	5.0%	3.0%	4.3%	3.4%	1.8%	1.8%	3.5%
Salaries, allowances and bonuses	153	210	221	303	367	361	400	678	865	2,312
YoY	62.5%	36.9%	5.4%	37.3%	21.2%	-1.8%	10.8%	69.6%	27.6%	167.3%
% of revenue	4.6%	4.8%	4.9%	4.7%	5.0%	6.0%	6.0%	2.5%	0.9%	1.1%
Depreciation	6	5	4	21	26	32	25	28	350	509
YoY	-24.6%	-14.6%	-26.9%	474.6%	20.4%	24.8%	-20.8%	11.0%	-	45.4%
% of revenue	0.2%	0.1%	0.1%	0.3%	0.3%	0.5%	0.4%	0.1%	0.4%	0.2%
Amortization of goodwill	17	17	17	34	101	107	77	12	147	375
YoY	-46.0%	0.0%	0.0%	94.4%	200.0%	5.7%	-27.9%	-84.5%	-	155.1%
% of revenue	0.5%	0.4%	0.4%	0.5%	1.4%	1.8%	1.2%	0.0%	0.2%	0.2%
Directors' compensations	58	84	91	96	113	118	133	109	115	134
YoY	-2.6%	43.9%	8.0%	6.1%	17.9%	4.2%	12.9%	-18.3%	5.5%	16.5%
% of revenue	1.7%	1.9%	2.0%	1.5%	1.6%	2.0%	2.0%	0.4%	0.1%	0.1%
R&D expenses	-	30	-	12	0	-	-	-	74	70
YoY	-	-	-	-	-98.0%	-	-	-	-	-5.4%
% of revenue	-	0.7%	-	0.2%	0.0%	-	-	-	0.1%	0.0%
Provision for doubtful accounts	2	0	12	182	13	-54	12	18	8	35
YoY	-27.6%	-	-	1422.5%	-93.1%	-	-	44.3%	-55.6%	337.5%
% of revenue	0.1%	-	0.3%	2.8%	0.2%	-	0.2%	0.1%	0.0%	0.0%
Other	165	212	237	398	410	446	523	2,090	4,808	5,755
YoY	-0.3%	28.0%	11.9%	67.9%	3.0%	8.8%	17.4%	299.4%	130.0%	19.7%
% of revenue	4.9%	4.8%	5.2%	6.1%	5.6%	7.4%	7.8%	7.8%	5.2%	2.6%

Source: Shared Research based on company data

Any differences between figures in the table and those in company data are due to rounding

## Operating profit

FY06/23 segment profit increased in line with revenue growth, the pass-through of soaring component and transportation costs in pricing, and lower container freight costs. In FY06/24, the launch of plants to manufacture solar cells—a key component of solar panels—will improve profit margins by reducing costs through in-house cell production, stabilize parts procurement, and enhance the company's ability to respond to import regulations in various countries.

Segment profit (JPYmn)	FY06/14	FY06/15	FY06/16	FY06/17	FY06/18	FY06/19	FY06/20	FY06/21	FY06/22	FY06/23
	Cons.	Cons.	Cons.	Cons.	Cons.	Cons.	Cons.	Cons.	Cons.	Cons.
Solar Panel Manufacturing business								731	1,238	12,701
YoY	-	-	-	-	-	-	-	-	69.4%	925.9%
% of total	-	-	-	-	-	-	-	40.9%	52.9%	92.1%
Green Energy business	271	539	625	529	1,297	932	817	1,005	1,112	1,076
YoY	30.4%	98.7%	16.0%	-15.5%	145.4%	-28.2%	-12.3%	23.0%	10.6%	-3.2%
% of total	63.0%	89.2%	99.7%	100.9%	105.5%	93.4%	112.4%	56.3%	47.5%	7.8%
IT business	85	29	4	26	8	63	-41	16	7	47
YoY	147.3%	-66.0%	-85.7%	538.0%	-68.6%	658.5%	-	-	-56.3%	571.4%
% of total	19.7%	4.8%	0.7%	5.0%	0.7%	6.3%	-5.6%	0.9%	0.3%	0.3%
Photocatalyst business								32	-17	-40
YoY	-	-	-	-	-	-	-	-	-	-
% of total	-	-	-	-	-	-	-	1.8%	-0.7%	-0.3%
Construction Machinery Sales business	74	37	-2	-31	-76	3	-50			
YoY	-	-50.5%	-	-	-	-	-	-	-	-
% of total	17.3%	6.1%	-0.3%	-5.9%	-6.1%	0.3%	-6.8%	-	-	-
Reportable segments total	430	605	627	524	1,230	997	727	1,786	2,341	13,785
YoY	81.3%	40.5%	3.7%	-16.5%	134.7%	-18.9%	-27.1%	145.7%	31.1%	488.9%
% of total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Other	0	0	0	0	0	-20	-6	-54	-45	-120
YoY	-	-	-	-	-	-	-	-	-	-
Adjustments	-167	-184	-230	-409	-303	-369	-359	-370	-689	-860
YoY	-	-	-	-	-	-	-	-	-	-
Total	264	420	397	115	927	608	362	1,361	1,605	12,804
YoY	28.4%	59.5%	-5.5%	-71.0%	704.7%	-34.4%	-40.5%	276.4%	17.9%	697.8%

Source: Shared Research based on company data

Any differences between figures in the table and those in company data are due to rounding

## OPM

Much like consolidated revenue and operating profit, OPM reached a record 12.7% in FY06/18, but has since trended lower. In FY06/21, OPM declined to 5.1% due to the impact of VSUN becoming a consolidated subsidiary, then to 1.7% in FY06/22 due to raw material price hikes and other factors. In FY06/23, it rose to 5.9% due to the easing of raw material price hikes and price pass-throughs. Regarding segment profit margins, in FY06/23, the Green Energy business was highest at 13.4%, followed by the IT business at 6.9% and the Solar Panel Manufacturing business at 6.1%.

Segment profit margin (%)	FY06/14	FY06/15	FY06/16	FY06/17	FY06/18	FY06/19	FY06/20	FY06/21	FY06/22	FY06/23
	Cons.	Cons.	Cons.	Cons.	Cons.	Cons.	Cons.	Cons.	Cons.	Cons.
Solar Panel Manufacturing business	-	-	-	-	-	-	-	3.5%	1.5%	6.1%
Green Energy business	11.6%	15.6%	15.9%	9.4%	19.9%	18.0%	13.1%	18.9%	11.2%	13.4%
IT business	32.7%	18.8%	4.6%	26.0%	10.2%	36.4%	-	26.2%	2.4%	6.9%
Photocatalyst business	-	-	-	-	-	-	-	18.1%	-	-
Construction Machinery Sales business	10.1%	4.7%	-	-	-	0.4%	-	-	-	-
Reportable segments total	12.9%	13.8%	13.8%	8.1%	16.8%	16.8%	11.1%	6.7%	2.5%	6.4%
Total	7.9%	9.6%	8.8%	1.8%	12.7%	10.2%	5.4%	5.1%	1.7%	5.9%

Source: Shared Research based on company data

Any differences between figures in the table and those in company data are due to rounding

## Capital expenditures

Purchases of solar power plants and equipment for solar panel manufacturing have been the main reasons behind changes in capital expenditures. In FY06/21, capital expenditures accounted for 23.4% of consolidated revenue because of such purchases, but the percentage dropped to 4.8% in FY06/22, and 6.2% in FY06/23.

Capital expenditures (JPYmn)	FY06/14	FY06/15	FY06/16	FY06/17	FY06/18	FY06/19	FY06/20	FY06/21	FY06/22	FY06/23
	Cons.	Cons.	Cons.	Cons.	Cons.	Cons.	Cons.	Cons.	Cons.	Cons.
Total capital expenditures	102	151	60	434	408	2,096	1,408	6,290	4,406	13,258
% of revenue	3.0%	3.4%	1.3%	6.7%	5.6%	35.0%	21.1%	23.4%	4.8%	6.2%

Source: Shared Research based on company data

Any differences between figures in the table and those in company data are due to rounding

## Earning potential

In FY06/23, ROE and ROA rose YoY to 53.8% and 12.3%, respectively. The average period in inventory fell from nine months in FY06/20 to three months in FY06/23. The average accounts receivable turnover period was one month or less for all fiscal years, while the average accounts payable turnover period declined from 2.3 months in FY06/21 to 0.9 months in FY06/23. As a result, the cash conversion cycle also declined from 3.2 months to 2.2 months. Sales contracts are on an individual order basis, with production taking place after orders are received, and the company receives a fixed amount in advance. The company is working to optimize its overall supply chain, spanning from order receipt to production and shipping, to maintain and enhance profitability.

Profit margins	FY06/14	FY06/15	FY06/16	FY06/17	FY06/18	FY06/19	FY06/20	FY06/21	FY06/22	FY06/23
(JPYmn)	Cons.	Cons.	Cons.	Cons.	Cons.	Cons.	Cons.	Cons.	Cons.	Cons.
Revenue	3,347	4,396	4,540	6,495	7,301	5,985	6,678	26,901	92,122	215,284
Cost of revenue	2,609	3,315	3,432	5,006	5,123	4,112	4,916	22,112	82,508	185,663
Gross profit	738	1,081	1,108	1,489	2,178	1,873	1,762	4,788	9,613	29,621
Operating profit	264	420	397	115	927	608	362	1,361	1,605	12,804
YoY	28.4%	59.5%	-5.5%	-71.0%	704.7%	-34.4%	-40.5%	276.4%	17.9%	697.8%
Operating profit margin	7.9%	9.6%	8.8%	1.8%	12.7%	10.2%	5.4%	5.1%	1.7%	5.9%
Net income attributable to owners of the parent	234	200	231	-176	757	316	211	537	806	4,965
YoY	100.6%	-14.6%	15.8%	-	-	-58.2%	-33.1%	154.2%	50.1%	516.0%
Net margin	7.0%	4.5%	5.1%	-	10.4%	5.3%	3.2%	2.0%	0.9%	2.3%
Inventory(Merchandise and finished goods, Work in process, Raw materials and supplies)	613	600	1,051	3,061	3,987	3,804	5,000	10,947	30,552	53,168
YoY	62.0%	-2.2%	75.3%	191.3%	30.2%	-4.6%	31.4%	118.9%	179.1%	74.0%
% of total assets	29.6%	23.7%	37.7%	47.8%	55.5%	34.6%	33.9%	27.8%	35.9%	37.0%
Accounts receivable	408	525	473	335	335	393	303	1,312	6,156	2,011
YoY	327.1%	28.5%	-9.9%	-29.2%	0.2%	17.2%	-22.8%	332.5%	369.2%	-67.3%
% of total assets	19.7%	20.7%	16.9%	5.2%	4.7%	3.6%	2.1%	3.3%	7.2%	1.4%
Accounts payable	514	436	529	331	411	533	991	5,058	14,595	16,412
YoY	211.7%	-15.2%	21.3%	-37.3%	23.9%	29.8%	86.0%	410.4%	188.6%	12.4%
% of total assets	24.8%	17.2%	18.9%	5.2%	5.7%	4.8%	6.7%	12.8%	17.1%	11.4%
Shareholders' equity(excl. stock acquisition rights and non-controlling interests )	864	1,038	1,219	1,077	1,767	1,969	2,093	4,006	5,873	12,596
YoY	70.8%	20.2%	17.4%	-11.6%	64.0%	11.4%	6.3%	91.4%	46.6%	114.5%
% of total assets	41.7%	41.0%	43.7%	16.8%	24.6%	17.9%	14.2%	10.2%	6.9%	8.8%
Total assets	2,073	2,531	2,790	6,400	7,189	10,985	14,765	39,388	85,121	143,691
YoY	77.3%	22.1%	10.2%	129.4%	12.3%	52.8%	34.4%	166.8%	116.1%	68.8%
% of total assets	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Cash flows from operating activities	-77	57	206	-984	405	-147	-861	-608	-6,449	18,526
Cash flows from investing activities	-116	-252	-75	-864	-559	-1,620	-472	-1,391	-13,221	-20,670
FCF	-194	-195	131	-1,848	-155	-1,766	-1,333	-1,999	-19,670	-2,144
Cash flows from financing activities	393	104	-85	1,991	-62	1,913	1,465	5,290	17,752	17,235
ROA (RP-based)	14.8%	14.7%	16.0%	1.1%	12.9%	6.2%	2.4%	4.7%	2.3%	12.3%
Return on equity(ROE)	34.2%	21.0%	20.5%	-15.3%	53.2%	16.9%	10.4%	17.6%	16.3%	53.8%
Tangible fixed asset turnover(excl. construction in progress)	28.9	26.1	22.0	9.0	5.5	2.7	2.1	3.1	5.6	9.8
Total asset turnover	2.1	1.9	1.7	1.4	1.1	0.7	0.5	1.0	1.5	1.9
Inventory turnover	5.3	5.5	4.2	2.4	1.5	1.1	1.1	2.8	4.0	4.4
Average period in inventory(months) ①	2.3	2.2	2.9	4.9	8.3	11.4	10.7	4.3	3.0	2.7
Accounts receivable turnover period(months) ②	0.9	1.3	1.3	0.7	0.6	0.7	0.6	0.4	0.5	0.2
Accounts payable turnover period(months) ③	1.6	1.7	1.7	1.0	0.9	1.4	1.9	1.6	1.4	1.0
Cash conversion cycle(months) ①+②-③	1.6	1.7	2.5	4.6	7.9	10.7	9.5	3.0	2.1	1.9

Source: Shared Research based on company data

Any differences between figures in the table and those in company data are due to rounding

## Financial standing

In FY06/23, shareholders' equity (excluding subscription rights and noncontrolling interests) increased to JPY12.6bn due to capital increases and accumulated profits. The equity ratio was 8.8%, up from 6.9% in FY06/23, and the company is targeting an equity ratio of 20% in FY06/26.

Financial ratios	FY06/14	FY06/15	FY06/16	FY06/17	FY06/18	FY06/19	FY06/20	FY06/21	FY06/22	FY06/23
(JPYmn)	Cons.	Cons.	Cons.	Cons.	Cons.	Cons.	Cons.	Cons.	Cons.	Cons.
Shareholders' equity(excl. stock acquisition rights and non-controlling interests )	864	1,038	1,219	1,077	1,767	1,969	2,093	4,006	5,873	12,596
Equity ratio	41.7%	41.0%	43.7%	16.8%	24.6%	17.9%	14.2%	10.2%	6.9%	8.8%

Source: Shared Research based on company data

Any differences between figures in the table and those in company data are due to rounding

## Market and value chain

Here, we will primarily focus on the solar panel market, where the mainstay businesses of the Abalance group belong. While there are no official statistics indicating the global market size for solar panels alone, the International Energy Agency (IEA) gives an estimate of the overall solar power generation market in its "Trends in Photovoltaic Application" report. In Japan, Yano Research Institute Ltd. (unlisted; hereinafter "Yano Research Institute") publishes forecasts on the amount of solar power generation installed in Japan.

### Solar power generation market

According to IEA, total revenue generated in the global solar power sector, including revenue from silicon, wafers, cells, and panels, reached USD230bn in 2022 (approximately JPY30tn based on average exchange rate of JPY132.43/USD in 2022), up 21.1% YoY. This figure was calculated, taking into account the solar panel (PV) annual installations, cumulative installations, and average cost of installation. Neither the base figures of the calculations, such as volume and per-unit value, nor data on future outlook are disclosed in the IEA report.

Total revenue generated in the global solar power sector grew at a CAGR of 15.9% over the past five years, with growth rates from 2020 onward finishing higher than the average. Since IEA does not disclose the details of its calculations, we attempted to estimate the value of PV per GW by simply dividing the total revenue by the PV annual installation data (in GW) in the IEA report. The Shared Research estimate (referred to as “reference value” in the table below) showed that from 2019, total revenue in the solar power sector grew due to an increase in the amount of PV installations, which more than compensated for the decline in unit value per GW.

## Total revenue generated by the global solar power generation market

Solar power generation market	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	CAGR over the past five years	CAGR over the past 10 years
Total revenue(USDmn)	86,000	82,000	80,000	110,000	110,000	132,000	135,000	160,000	190,000	230,000		
YoY	14.7%	-4.7%	-2.4%	37.5%	0.0%	20.0%	2.3%	18.5%	18.8%	21.1%	15.9%	11.9%
(Reference value)												
PV annual installations(GW)	38	40	51	77	103	105	113	146	174	236		
YoY	26.8%	6.1%	25.9%	52.1%	34.0%	1.7%	7.9%	28.9%	19.2%	36.0%	18.1%	23.0%
Unit value(per GW, USDmn)	2,275	2,045	1,584	1,432	1,069	1,262	1,196	1,100	1,095	975		
YoY	-9.6%	-10.1%	-22.5%	-9.6%	-25.4%	18.0%	-5.2%	-8.0%	-0.4%	-11.0%	-1.8%	-9.1%

Source: Shared Research based on data from the respective years' "Trends in Photovoltaic Applications" report published by the International Energy Agency

# Global electricity demand and supply; output capacity

## Outlook on global electricity demand and supply

The WEO 2023 report predicts that global energy systems will be transformed over the next decade as power supply systems are reshaped by the rise of solar, wind, electric vehicles, heat pumps, and other clean energy technologies. Global electricity demand will increase in all scenarios due to population growth, rising incomes, and increasing end-use electrification. By 2050, electricity demand is expected to grow 80.0% from current levels in the stated policies scenario (STEPS), 120% in the announced pledges scenario (APS), and 150% in the net zero emissions by 2050 scenario. Additional demand will be met primarily by renewable energy, nuclear power, fossil fuels with carbon capture, hydrogen, and ammonia, all of which will account for a higher share of electricity supply in each scenario.

### WEO presents outlook in three scenarios

The WEO report presents three scenarios, providing a framework to explore the effects of various policy choices, investment trends, and technological developments on the projections. Assumptions for each of the scenarios are as follows.

- \* **Stated policies scenario (STEPS)** shows the trajectory implied by current policy settings
- \* **Announced pledges scenario (APS)** assumes all aspirational targets announced by countries—including their long-term net zero and energy access goals—are met in full and as scheduled
- \* **Net zero emissions by 2050 scenario (NZE)** proposes a way to limit global warming to 1.5°C, achieving universal access to modern energy by 2030

## Outlook on installed electricity capacity

The WEO also provides an outlook on installed electricity capacity by source. In all scenarios, installed capacity of solar and wind power is expected to expand the most. Solar power plant capacity is expected to grow under the STEPS scenario, from 1,145GW in 2022 to 4,699GW in 2030, 9,500GW in 2040, and 12,639GW in 2050. The APS and NZE scenarios require even larger growth in installed capacity.

## Outlook on global installed capacity by power source

Outlook on installed capacity by power source (GW)	Results		Stated policies scenario(STEPS)			Announced pledges scenario(APS)			Net zero emissions by 2050 scenario(NZE)		
	2021	2022	2030	2040	2050	2030	2040	2050	2030	2040	2050
Total	8,230	8,643	14,168	21,328	25,956	15,285	25,195	32,100	16,180	29,354	36,956
(WEO2022)			11,954	16,468	19,792	12,932	20,258	26,541	15,306	26,870	33,878
Renewable energy	3,292	3,629	8,611	14,965	19,120	9,786	18,893	25,368	11,008	23,331	30,275
Solar	925	1,145	4,699	9,500	12,639	5,377	11,787	16,041	6,101	14,303	18,753
(WEO2022)			3,020	5,573	7,464	3,498	7,471	11,065	5,052	11,620	15,468
Wind	827	902	20,644	3,242	3,874	2,420	4,337	5,879	2,742	5,797	7,616
Hydroelectric	1,360	1,392	1,571	1,801	2,028	1,620	1,991	2,304	1,765	2,313	2,612
Nuclear	413	417	482	557	622	497	677	769	541	813	916
Hydrogen and Ammonia			8	24	19	31	174	195	129	447	427
Fossil fuels	4,480	4,535	4,500	4,238	3,831	4,233	3,410	2,638	3,473	1,913	1,133
Storage battery	27	45	552	1,531	2,352	725	2,029	3,121	1,018	2,841	4,199

Source: "World Energy Outlook 2022" report released by the International Energy Agency

A Shared Research estimate on the required additions in installed capacity per year, based on the projections for solar power and wind power output capacities, showed that in the STEPS, the required addition per year came to 444GW through 2030, 464GW through 2040, and 411GW through 2050. Since output capacity increased by 220GW in 2022, the required addition of 444GW per year from 2021 through 2030 based on STEPS (the most conservative scenario) represents a roughly twofold increase.

## Outlook on installed capacity for solar and wind power

Outlook on installed capacity for solar and wind power (GW)	Results		Stated policies scenario(STEPS)			Announced pledges scenario(APS)			Net zero emissions by 2050 scenario(NZE)		
	2021	2022	2030	2040	2050	2030	2040	2050	2030	2040	2050
Solar	925	1,145	4,699	9,500	12,639	5,377	11,787	16,041	6,101	14,303	18,753
Projected annual growth of installed capacity	-	220	444	464	411	529	591	532	620	731	629
Wind	827	902	20,644	3,242	3,874	2,420	4,337	5,879	2,742	5,797	7,616
Projected annual growth of installed capacity	-	75	2,468	130	106	190	191	178	230	272	240

Source: "World Energy Outlook 2022" report released by the International Energy Agency

The "Renewables 2022" report also published by IEA provides historical data on solar power output capacity by country and region. In 2021, the overall installed capacity for solar power stood at 1,183GW globally, of which China accounted for the largest proportion at 414GW, then the US at 142GW, Japan at 85GW, and Germany at 67GW. The CAGR over the five years from 2018 to 2022 was 23.6% overall, with the CAGR in the Netherlands, Spain, Australia, and Italy exceeding 30% for the same period.

## Installed capacity by country and region

Major countries solar power generation installed capacity(GW)(GW)	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	CAGR over the past five years
Total	140	180	230	307	410	515	628	774	947	1,183	23.6%
China	18	28	43	78	131	175	205	254	309	414	25.9%
US	13	19	26	41	52	62	76	96	120	142	22.3%
Japan	14	23	34	42	50	56	63	72	78	85	11.4%
Germany	37	38	39	41	42	45	49	54	60	67	9.7%
Australia	3	4	5	6	7	12	16	21	25	30	33.6%
South Korea	2	3	4	5	6	8	13	17	22	24	33.0%
Italy	18	19	19	19	20	20	21	22	23	25	4.9%
Spain	5	5	5	5	6	6	12	16	22	30	38.4%
Netherlands	1	1	2	2	3	5	7	11	14	18	44.5%
France	5	6	7	8	10	11	12	13	17	20	15.2%
Other	25	35	46	61	84	114	153	199	257	328	31.2%

Source: "Renewables 2022" report released by the International Energy Agency

The IEA power generation capacity outlook from 2022 to 2027 indicated a fall in the overall growth rate to a CAGR of 16.5%. Still, the growth rates in MENA, Spain, and Brazil are expected to surpass 20%. A comparison of the actual growth in solar power output capacity from 2017 to 2021 and the projected growth from 2022 to 2027 shows that, excluding a few countries like Japan, output capacity will more than double in many countries and regions. According to the "Renewables 2022" report, concerns over energy security due to Russia's invasion of Ukraine are driving countries to reduce their dependence on imported fossil fuels whose prices are soaring, and switch to renewables such as solar and wind power at an accelerated pace.

## Outlook on installed capacity by country and region

Global solar power generation installed capacity(GW)	2021	2022 est.	2023 est.	2024 est.	2025 est.	2026 est.	2027 est.	CAGR over the five years from 2017 to 2021		CAGR over the five years from 2022 to 2027		Growth from 2017 to 2021	Growth from 2022 to 2027
								2017 to 2021	2022 to 2027	2017 to 2021	2022 to 2027		
Total	891	1,101	1,321	1,553	1,803	2,065	2,359	24.1%	16.5%	589	1,259		
China	308	400	497	596	700	799	915	31.8%	18.0%	231	515		
(Europe)	195	233	273	314	360	410	464	13.2%	14.8%	90	231		
US	119	138	162	192	227	269	316	23.4%	18.1%	77	179		
Japan	78	84	91	98	103	107	111	13.1%	5.9%	36	28		
India	52	68	83	99	117	138	161	40.0%	18.8%	43	93		
Germany	59	66	75	84	96	110	127	7.7%	13.9%	18	61		
Australia	25	30	34	39	43	47	53	34.3%	12.1%	20	23		
(ASEAN)	26	29	33	38	43	49	55	46.6%	13.4%	22	26		
South Korea	22	25	30	34	38	41	45	34.7%	12.1%	17	20		
Italy	23	25	27	30	33	37	42	3.2%	10.8%	3	17		
Brazil	13	25	34	41	49	58	66	165.1%	21.4%	13	41		
Spain	15	21	29	37	45	53	61	26.1%	23.3%	10	40		
Netherlands	14	19	23	27	31	34	36	46.8%	14.5%	12	18		
France	15	18	21	23	27	29	32	13.8%	12.2%	7	14		
(Middle East and North Africa)	12	15	19	24	31	38	46	44.1%	25.3%	10	31		
UK	14	15	16	17	20	23	26	3.0%	12.6%	2	12		
Other	42	55	66	78	92	109	127	32.0%	18.4%	32	73		

Source: "Renewables 2022" report released by the International Energy Agency

Note: Estimates are based on the main scenario



## Solar panel production capacity, production, and prices

While the IEA projects an increase in installed capacity for solar power, solar panels manufactured in 2022 stood at 379GW versus an overall production capacity of 717GW. The 2022 capacity utilization rate (production/production capacity) was 52.8%. A comparison of the CAGR of the past five years showed that production capacity has increased at a faster pace than production growth, causing the capacity utilization rate to trend around 50%.

### Solar panel production and production capacity

Solar panel production and production capacity(GW)	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	CAGR over the past five years	CAGR over the past 10 years
Production capacity	61	67	94	105	155	184	219	327	483	717		
YoY	5.1%	10.4%	39.3%	11.9%	47.7%	18.7%	19.2%	49.0%	47.8%	48.4%	35.8%	28.6%
Production	40	46	63	78	105	116	140	179	242	379		
YoY	9.3%	15.3%	36.3%	24.6%	34.7%	10.3%	21.0%	27.9%	35.0%	56.2%	29.2%	26.4%
Capacity utilization rate(%)	65.4%	68.3%	66.9%	74.4%	67.9%	63.1%	64.0%	54.9%	50.2%	52.8%		

Source: Shared Research based on data from the "Trends in Photovoltaic Applications" report by the International Energy Agency

In a global solar panel price index that sets 2015 as the base year (100), the index number was 30 in 2021. According to the index, prices declined 32% YoY in 2018, but the margin of decline narrowed since, and turned to a 16% YoY increase in 2021. The "Trends in Photovoltaic Applications 2022" report by IEA explained that although oversupply cast a downward pressure, prices rose in 2021 because of an increase in demand for polycrystalline silicon, which is a key raw material for solar panels.

### Solar panel prices

Solar panel prices	2015	2016	2017	2018	2019	2020	2021
Price index(2015=100)	100	92	66	45	32	26	30
YoY	-9%	-8%	-28%	-32%	-29%	-19%	15%

Source: "Technology cost trends for solar PV module, 2015-2021" released by the International Renewable Energy Agency

## Costs of power generation facilities

The International Renewable Energy Agency (IREA) provides data on installed costs of renewables-based power generation facilities across the world. According to the data, total installed costs and levelised cost of electricity (USD/kWh) declined the most for solar power facilities in the period from 2010 to 2022, indicating heightened cost advantage of solar power systems. Total installed costs of solar power projects fell 83%, and levelised cost of electricity for solar fell 89%. The facility utilization rate was a low 17% in 2022, although up from 14% in 2010.

	Total installed costs(USD/kW)			Facility utilization rate(%)			Levelised cost of electricity(USD/kWh)		
	2010	2022	Rate of change	2010	2022	Rate of change	2010	2022	Rate of change
Biomass	2,904	2,162	-26%	72	72	1%	0.082	0.061	-25%
Geothermal	2,904	3,478	20%	87	85	-2%	0.053	0.056	6%
Hydroelectric	1,407	2,881	105%	44	46	4%	0.042	0.061	47%
Solar	5,124	876	-83%	14	17	23%	0.445	0.049	-89%
CSP	10,082	4,274	-58%	30	36	19%	0.38	0.118	-69%
Onshore wind	2,179	1,274	-42%	27	37	35%	0.107	0.033	-69%
Offshore wind	5,217	3,461	-34%	38	42	10%	0.197	0.081	-59%

Source: Shared Research based on the "Renewable Power Generation Costs in 2022" report issued by the International Renewable Energy Agency

Note: The weighted average is applied to both total installed costs and levelised cost of electricity

Trends over the past five years and the past decade both indicate a decline in total installed costs and levelised cost of electricity, year on year.

Global solar power generation costs	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	GAGR from 2018 to 2022	CAGR from 2013 to 2022
Total installed costs(USD/kW)	3,343	2,935	2,653	2,016	1,833	1,586	1,355	1,120	983	917	876	-11.2%	-12.5%
Facility utilization rate(%)	15.1%	16.4%	16.6%	16.5%	16.7%	17.6%	17.9%	17.5%	16.1%	16.2%	16.9%		
Levelised cost of electricity(USD/kWh)	0.248	0.191	0.172	0.129	0.113	0.089	0.075	0.066	0.059	0.051	0.049	-11.3%	-15.0%

Source: Shared Research based on the "Renewable Power Generation Costs in 2022" report issued by the International Renewable Energy Agency

## Solar panel supply chain

The manufacturing processes of a solar panel constitute the production of polycrystalline silicon, ingots, wafers, solar cells, and panels. By country, China leads in production capacity for each of these materials. According to IEA, China produced 79.4% of polycrystalline silicon, 96.8% of silicon wafers, 85.2% of solar cells, and 74.6% of solar modules manufactured in

2021. Similarly, the IEA's forecasts for 2027 show no significant change in the shares, with China continuing to account for a high share of production for each material.

## Solar panel production capacity by country and region

Solar panel production capacity	Demand		Module		Solar cell		Wafer		Polycrystalline silicon	
	2021	2027	2021	2027	2021	2027	2021	2027	2021	2027
	Results	Forecast	Results	Forecast	Results	Forecast	Results	Forecast	Results	Forecast
China	36.5%	40.3%	74.6%	73.9%	85.2%	79.5%	96.8%	88.6%	79.4%	89.2%
North America	16.8%	16.9%	2.7%	5.8%	0.6%	3.5%	0.0%	3.6%	5.6%	3.0%
Europe	17.8%	18.2%	2.8%	2.0%	0.6%	0.7%	0.5%	0.2%	8.0%	2.4%
Asia Pacific	13.4%	8.1%	15.3%	10.7%	12.2%	9.9%	2.5%	2.8%	6.0%	2.0%
India	7.1%	8.5%	3.1%	6.8%	1.2%	6.3%	0.0%	4.7%	0.0%	3.1%
Other	8.5%	8.0%	1.4%	0.8%	0.2%	0.1%	0.1%	0.1%	1.1%	0.3%

Source: International Energy Agency "Will new PV manufacturing policies in the United States, India and the European Union create global PV supply diversification?" (Dec 2022)

## Solar power generation market in Japan

According to Yano Research Institute, solar power generation installed in Japan in FY06/22 amounted to 5,438MW (5.4GW). By contract, the FIT business accounted for 3,650MW (67.1% of the total) and FIT residential 981MW (18.0%), with FI accounting for 85.1% of the total. PPA remained at 347MW (6.4%) and private consumption amounted to 307MW (5.6%). With the introduction of FIP in addition to FIT in FY06/22, electricity from new commercial solar power generation with an installed capacity of 1,000kW or more was no longer subject to FIT bidding in FY06/22, while all FIP is subject to bidding. From FY06/23, commercial solar power generation of 500kW or more, and from FY06/24 250kW or more, will be subject to FIP bidding. The amount of solar power generation in Japan in FY06/30 is expected to reach 6,151MW, with a CAGR of 1.9%. According to the Yano Research Institute, PPA is the most common type of contract, followed by self-consumption.

(MW)	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	CAGR
Solar power generation installed	5,202	5,438	5,159	4,960	5,754	5,952	5,952	6,052	6,101	6,151	(2021-2030)
YoY		4.5%	-5.1%	-3.9%	16.0%	3.4%	0.0%	1.7%	0.8%	0.8%	1.9%

Source: Renewable Energy for 2030 - Solar PV Power Generation, Yano Research Institute

\*Installed capacity is the sum of solar power generation, PPA, O&M services, solar power plant secondary market, reuse/recycling of end-of-life solar panels, and spot-type inspection and diagnostic services.

## Competition

According to BloombergNEF's Q4 2022 Tier 1 list, there are over 30 solar panel manufacturers globally. A Shared Research calculation on manufacturing capacity by company, assuming total global annual manufacturing capacity of 482GW in 2021 (IEA data), showed that LONGi Green Energy Technology Co., Ltd. (SSE: 601012) accounted for 12.4% of the total, followed by Trina Solar Co. Ltd. (SSE: 688599) at 10.4%, and JinkoSolar Holding Co., Ltd. (NYSE: JKS) at 9.3%. The top 15 companies made up 63.2% of the overall market, and Chinese companies, 54.0%. Canadian Solar Inc. (NASDAQ: CSIQ), headquartered in Canada, has key plants in China. The South Korean Hanwha Qcells Co., Ltd. (NASDAQ: HQCL), primarily based in Germany, also has plants in China.

Of the top 15 companies, ten are listed on stock exchanges such as the Shanghai, Beijing, and Shenzhen stock exchanges, and NYSE and NASDAQ in the US. There are four to five solar panel manufacturers in Vietnam, with one of the largest being VSUN.

VSUN ranks around 15th globally by annual manufacturing capacity, which has expanded to 5GW or 1.0% of the global total. Competition centers on the top 15, but here, we consider JinkoSolar (China), Canadian Solar (Canada), and First Solar, Inc. (US; NASDAQ: FSLR) as VSUN's peer companies, since they are comparable in terms of accounting standards, among other factors.

## JinkoSolar Holding Co., Ltd. (NYSE: JKS)

JinkoSolar, established in 2006 and headquartered in the Shangrao economic development zone (Jiangxi, China), is a solar product manufacturer ranking third globally by annual manufacturing capacity for solar panels. JinkoSolar initially focused on the production of wafers, but eventually began manufacturing panels. Since 2016, it has ranked among the top global panel manufacturers by cumulative shipment volume. JinkoSolar manufactures wafers, solar cells, and panels. At end-2022, its annual manufacturing capacity stood at 65GW for wafers, 55GW for solar cells, and 70GW for panels. JinkoSolar has 12 production bases in China, Vietnam, Malaysia, and a global sales network. It listed on NYSE in 2010, and in FY12/22,

consolidated revenue was USD12.1bn, EBITDA was USD67mn, and net income attributable to owners of the parent was USD90mn. The employee count was 45,500.

## Canadian Solar Inc. (NASDAQ: CSIQ)

Canadian Solar, established in 2001 and headquartered in British Columbia (Canada), ranks among the world's largest solar power project operators/solar product manufacturers. In addition to having a vertically integrated manufacturing system for solar cells, it also engineers, develops, and manufactures other products for solar power generation and energy storage. Canadian Solar operates globally, with particular focus on North America, South America, and Europe. At end-2022, its annual manufacturing capacity stood at 20GW for ingots, 20GW for wafers, 20GW for solar cells, and 32GW for solar modules. Production bases are located in China and Southeast Asia. It listed on NASDAQ in 2006, and in FY12/22, consolidated revenue was USD7.5bn, EBITDA was USD641mn, and net income attributable to owners of the parent was USD240mn. The employee count stood at 18,400.

## First Solar, Inc. (NASDAQ: FSLR)

First Solar, established in 1999 and headquartered in Arizona, is a solar technology company. It manufactures and sells high-performance and low-carbon products. These include solar panels made of cadmium telluride-coated glass, which were developed in First Solar's US-based R&D lab applying its thin-film technology. The company seeks to manage the entire product lifecycle from procurement of raw materials to the recycling of used panels. At end-2022, its annual solar panel manufacturing capacity stood at 9.8GW. By creating production bases in the US, Malaysia, Vietnam, and India, First Solar has built a production system that does not rely on China's silicon supply chain. It listed on NASDAQ in 2006, and in FY12/22, consolidated revenue was USD2.6bn, EBITDA was USD242mn. First Solar logged a USD44mn net loss attributable to owners of the parent in FY12/22. The employee count was 5,500.

## Production system and sales by region

Among the four companies, JinkoSolar boasts the largest total manufacturing production capacity at 190GW. Canadian Solar's production capacity is about half this figure, at 92GW, while First Solar's and VSUN's both fall short at less than 10GW. JinkoSolar and Canadian Solar have built a vertically integrated production system from the upstream to downstream processes of manufacturing. Under the umbrella of Abalance, VSUN, which had only handled downstream panel production, also plans to produce ingots and wafers in line with the completion of cell plant construction and commencement of operations in October 2023. Most JinkoSolar and Canadian Solar plants are located in China. VSUN's solar panel plants are in Vietnam, although the company still relies on China for raw materials. First Solar manufactures cadmium telluride (CdTe) solar panels, building a supply chain outside of China (mainly in the US).

In terms of revenue by region, both Canadian Solar and JinkoSolar generate revenue globally, while 84% of First Solar's revenue comes from the US alone. VSUN sales mostly come from the US and Europe. As only a portion of VSUN financial statements are publicly available, Shared Research used the financial statements of Abalance (VSUN revenue in FY06/23 accounted for 96.1% of overall sales).

## Annual production capacity of the four companies

	Abalance		Canadian Solar		First Solar		JinkoSolar	
	Japan	China	Canada	US	US	China	China	China
Established	2000	2001	2001	1999	1999	2001	2001	2001
Fiscal year	FY06/22	FY06/23	FY12/21	FY12/22	FY12/21	FY12/22	FY12/21	FY12/22
Annual production capacity(GW)								
Ingot	0.0	0.0	5.4	20.4	0.0	0.0	0.0	0.0
Wafer	0.0	0.0	11.5	20.0	0.0	0.0	32.5	65.0
Solar cell	0.0	0.0	13.9	19.8	0.0	0.0	24.0	55.0
Panel/Module	2.6	5.0	23.9	32.2	7.9	9.8	45.0	70.0
Total	2.6	5.0	54.7	92.4	7.9	9.8	101.5	190.0
Number of employees	1,008	1,430	13,535	18,423	4,800	5,500	31,030	46,511
Revenue composition by region								
North America	74.0%	86.7%	43.2%	37.4%			16.2%	4.5%
US			30.1%	26.3%	84.0%	83.7%		
Europe	4.0%	4.9%	16.3%	25.9%			18.3%	23.6%
France			0.5%	0.4%	4.2%	2.6%		
China			22.9%	25.5%			24.8%	41.9%
Asia(excl. China)			17.7%	11.2%			25.1%	13.6%
Japan	11.7%	4.0%	9.6%	4.4%	7.1%	1.8%		
India			2.7%	2.6%	1.3%	1.4%		

Source: Shared Research based on company data

\*Abalance annual production capacity is VSUN, number of employees; revenue by region are Abalance figures.

## Profits and financial standing

In FY06/23, ROE of Abalance increased to 12.3% YoY (2.3% in FY06/22), and ROA increased to 53.8% YoY (16.3%), both of which were higher than the other three companies. The same was true for net margins. Profits increased in line with strong panel sales to US and European markets, and the implementation of price passthroughs to counter rising container freight rates and higher material and transportation costs. Abalance's cost ratio, which was nearly 90% in FY06/22, declined to 86.2% in FY06/23, a level comparable to that of competitors.

(JPYmn)	Abalance		Canadian Solar		First Solar		JinkoSolar	
Fiscal year	FY06/22	FY06/23	FY12/21	FY12/22	FY12/21	FY12/22	FY12/21	FY12/22
Accounting standard	JPGAAP	JPGAAP	USGAAP	USGAAP	USGAAP	USGAAP	USGAAP	USGAAP
Revenue	92,122	215,284	612,257	849,181	339,170	297,817	743,290	1,370,349
YoY	242.4%	133.7%	68.5%	38.7%	19.7%	-12.2%	32.1%	84.4%
Cost of revenue	82,508	185,663	506,759	705,562	254,481	289,874	622,078	1,167,942
YoY	273.1%	125.0%	74.0%	39.2%	19.9%	13.9%	34.1%	87.7%
Cost of revenue ratio	89.6%	86.2%	82.8%	83.1%	75.0%	97.3%	83.7%	85.2%
Gross profit	9,613	29,621	105,498	143,619	84,689	7,943	121,213	202,407
YoY	100.8%	208.1%	46.3%	36.1%	19.1%	-90.6%	22.6%	67.0%
GPM	10.4%	13.8%	17.2%	16.9%	25.0%	2.7%	16.3%	14.8%
SG&A expenses	8,007	16,816	83,410	103,134	33,702	39,864	101,141	195,331
YoY	133.6%	110.0%	70.0%	23.6%	-11.2%	18.3%	44.0%	93.1%
SG&A ratio	8.7%	7.8%	13.6%	12.1%	9.9%	13.4%	13.6%	14.3%
Net income	806	4,965	11,051	27,284	54,378	-5,022	13,127	10,229
YoY	50.1%	516.0%	-27.9%	146.9%	30.6%	-109.2%	255.8%	-22.1%
Net margin	0.9%	2.3%	1.8%	3.2%	16.0%	-1.7%	1.8%	0.7%
ROE(Net income)	2.3%	12.3%	5.3%	12.4%	7.9%	-0.8%	6.5%	3.8%
ROA (Net income)	16.3%	53.8%	1.3%	2.7%	6.3%	-0.5%	1.0%	0.6%

Source: Shared Research based on company data

Notes: Financial statements for the three companies (Canadian Solar, First Solar, and JinkoSolar) are denominated in USD and converted into JPY using the exchange rate as of December 31 (end-December 2021:JPY116.0; end-December 2022:JPY113.7)

ROE and ROA are based on comparable net income for accounting purposes

The equity ratio for FY06/23 was 8.8%, up from 6.9% in FY06/22, but still below that of other companies.

(JPYmn)	Abalance		Canadian Solar		First Solar		JinkoSolar	
Fiscal year	FY06/22	FY06/23	FY12/21	FY12/22	FY12/21	FY12/22	FY12/21	FY12/22
Accounting standard	JPGAAP	JPGAAP	USGAAP	USGAAP	USGAAP	USGAAP	USGAAP	USGAAP
Total assets	85,121	143,691	857,195	1,027,521	860,143	938,165	1,328,742	1,791,291
Shareholders' equity(excl. stock acquisition rights and non-controlling interests )	5,873	12,596	208,962	220,764	691,427	663,559	201,173	269,319
YoY	46.6%	114.5%	27.3%	5.6%	19.8%	-4.0%	25.8%	33.9%
Equity ratio	6.9%	8.8%	24.4%	21.5%	80.4%	70.7%	15.1%	15.0%
Operating cash flows	-6,449	18,526	-47,366	104,221	27,562	99,302	7,840	-95,626
Investing cash flows	-13,221	-20,670	-49,839	-71,686	-11,491	-135,596	-205,897	-202,310
Financing cash flows	17,752	17,235	-49,741	-71,303	-62,685	-102,740	218,798	330,011

Source: Shared Research based on company data

Note: Financial statements for the three companies (Canadian Solar, First Solar, and JinkoSolar) are denominated in USD and converted into JPY using the exchange rate as of December 31 (end-December 2021:JPY116.0; end-December 2022:JPY113.7)

## Strengths and weaknesses

### Strengths

#### Establishing unique differentiation by expanding solar panel production capacity in Vietnam, rather than China

Abalance explains that it made a foray into Vietnam because of its inexpensive, hard-working labor force and relatively stable political system. Shared Research believes the company sought to capitalize on demand for solar panels free from US import restrictions and tariffs amid prolonged US–China trade frictions. After becoming a consolidated subsidiary, VSUN has expanded its solar panel production capacity, making it the top-selling Japanese brand and company in the market. A state-of-the-art cell factory commenced operations in Vietnam from late October 2023, and cell production is also underway.

According to the IEA, in terms of solar panel production by country, China led in 2021 with 74.7%, followed by Vietnam with 6.8%, Malaysia with 3.7%, South Korea with 3.3%, and the United States with 2.7% of overall production. VSUN's main competitors are major solar panel manufacturers operating worldwide, mostly large Chinese companies. Similar to VSUN, companies such as First Solar in the US have a set production scale and are limited to producing solar production panels outside of China. VSUN procures raw materials from Europe, the US, and Southeast Asia, manufactures solar panels in Vietnam, and exports them mainly to the US and Europe. Prolonged trade frictions between the US and China, as well as Russia's war in Ukraine, have led to supply chain revisions, and demand for solar panels from non-Chinese sources is

increasing in the US and other countries. In addition to the ongoing expansion of panel and cell plant manufacturing capacity in Vietnam, VSUN also plans to manufacture panels in the US.

### **With the addition of VSUN's production function, the company has formed a global supply chain and established the Japan brand, enabling it to provide end-to-end services in Japan that no other peers can match**

The Abalance group conducts solar power plant trades, sells goods associated with solar power generation, and offers a full range of services from the planning phase of solar power projects to engineering, development, and construction of the facility, operation and maintenance, and even recycling. Receiving a contract that spans the entire lifecycle of a facility allows the company to provide seamless, speedy, and efficient services. The company also offers customers support in areas such as contracts with power utilities, confirmation of laws and regulations with the local government, explanation to local residents, and paperwork necessary to obtain loans from financial institutions. In addition, recurring revenue businesses generate stable cash flow via income from electricity sales revenue.

Abalance made VSUN a consolidated subsidiary in December 2020, bringing the manufacture of Japan brand solar panels in-house, forming a global supply chain and enabling the company to provide end-to-end services that no other domestic companies can match. Operation of the VSUN solar cell plant that finished construction in late October 2023 will further strengthen Abalance's overarching services.

### **VSUN is well recognized by third-party organizations and major purchasers for its sustainable procurement practices and its solar panel quality, which bears comparison with major manufacturers**

Chinese companies dominate the top positions in the global solar panel manufacturer rankings by annual production volume. Meanwhile, VSUN ranks around 20th with an annual production capacity of 5GW. According to a Shared Research estimate, roughly 60% of world's production capacity is shared by some 15 companies, while numerous small and medium-sized manufacturers make up the remaining 40%.

VSUN has gained the recognition of third-party organizations and major buyers not only for the reliable quality and performance of its products, but also for its procurement practices. Such recognition plays a significant role in VSUN's competition with majors companies. For instance, VSUN has been recognized as a "Top Performer" in the PV Module Reliability Scorecard (released by US-based PV Evolution Labs [PVEL]) since 2021, becoming one of the few manufacturers to receive this accolade. Further, in an assessment conducted by EcoVadis, a global rating agency based in France that assesses companies' sustainable procurement practices (including their responses to human rights violations in China), VSUN has received the Bronze Medal since 2021. VSUN has also cleared the strict quality standards of major purchasers such as French petroleum company TotalEnergies and French energy and gas company Engie.

## **Weaknesses**

### **Solar panels, VSUN's main product, are susceptible to demand/supply and price fluctuations due to policy changes by various governments. In response, VSUN plans to reduce the risk of policy changes by not only producing panels and internalizing component manufacturing in Vietnam but also planning panel production in the US**

Solar panels play a crucial role in the transition to a decarbonized society. While governments around the world provide incentives for early adoption of solar power generation, they also tend to impose tariffs on imported goods to protect their economies. The US, a key market for VSUN, has set a goal to achieve net-zero greenhouse gas emissions by 2050. This objective necessitates a substantial number of solar panels, creating robust demand. However, solar panel production predominantly takes place in China, which has led to trade tensions between the US and China.

The US has intensified its protectionist stance on products related to solar panels, implementing strict tariffs such as anti-dumping duties, countervailing duties, and safeguard measures on imports from China. Nonetheless, to meet its robust domestic demand, the US has temporarily lifted tariffs on imports from four Southeast Asian countries, including Vietnam, for two years starting from June 2022. Consequently, Chinese manufacturers are increasingly establishing production bases in Southeast Asia. In response, the US has identified five Chinese solar panel producers (excluding VSUN) as circumvention exporters. The market dynamics and pricing of solar panels are likely to fluctuate with abrupt policy changes such as this.

VSUN is not currently identified as a circumvention exporter and has expanded its panel production in Vietnam to include the production of cells, a key component of solar panels. Additionally, the company is working toward bringing the production of wafers and ingots, key materials for solar panels, in-house. Moreover, VSUN is considering manufacturing panels within the US to mitigate policy-related risks.

### **VSUN's production scale is still small compared to the major players, but the company plans to expand its panel and cell manufacturing capacity, as well as produce ingots and wafers**

VSUN's main competitors are major solar panel manufacturers, particularly those in China. LONGi Green Energy Technology tops the market with an annual manufacturing capacity of 60GW. Trina Solar ranks second at 50GW, and JinkoSolar is third at 45GW. In contrast, annual production capacity of VSUN's solar panel plants is around 5GW, only about 10% compared to the major companies'. Large manufacturers are involved in the upstream processes as well, manufacturing wafers and solar cells alongside solar panels. Much like VSUN, First Solar also manufactures panels outside China; its annual production capacity is 9.8GW. VSUN also began manufacturing cells in late October 2023, but with an annual manufacturing capacity of 4GW, the scale of production is still small compared to the major players. Under its medium-term management plan, VSUN will expand its annual solar panel and cell manufacturing capacity to 10GW, and wafer and ingot manufacturing capacity to 4GW by FY06/26.

### **In order to maintain a high level of investment using bank loans, the company needs to improve its financial soundness and plans to increase its equity ratio to 20% in FY06/26.**

The company plans to expand annual solar panel and cell manufacturing capacity to 10GW, and to 4GW for wafers and ingots, by FY06/26, and will continue making large investments. VSUN has been financing investments to date with loans it secured from a major domestic financial institution in Vietnam. To maintain bank loans amid ongoing high levels of investment, the group as a whole must maintain financial soundness.

Abalance free cash flows remain in the red due to the development of solar power plants, M&A, and investments in solar panel and cell plants. Although the company has conducted capital increases, investments have been mostly funded by bank borrowings, resulting in expanded interest-bearing debt and the equity ratio falling to 6.9% at end-FY06/22. At end-FY06/23, the equity ratio improved to 8.8% in line with capital increases and accumulated profits, but the company will need to further improve financial soundness to continue using bank loans to maintain high levels of investment. The company is targeting an equity ratio of 20% in FY06/26.

In August 2023, Abalance announced plans to list and raise funds through an SPAC, which will effectively list Cell Company, its cell manufacturing subsidiary in Vietnam, on the NASDAQ stock exchange in the US. The funds raised are being considered for allocation to the construction of a factory in the US. This requires approval from BWAQ shareholders and the US Securities and Exchange Commission (SEC), as well as compliance with various laws and regulations in each country. Furthermore, a press release from Abalance dated March 28, 2024, revealed that TOYO Co, the parent company of Cell Company, has verified the effectiveness of the Form F-4 registration statement filed with the US Securities and Exchange Commission (SEC) in accordance with the Securities Act of the United States.

# Financial statements

## Income statement

Income statement	FY06/14	FY06/15	FY06/16	FY06/17	FY06/18	FY06/19	FY06/20	FY06/21	FY06/22	FY06/23
(JPYmn)	Cons.	Cons.	Cons.	Cons.	Cons.	Cons.	Cons.	Cons.	Cons.	Cons.
<b>Revenue</b>	3,347	4,396	4,540	6,495	7,301	5,985	6,678	26,901	92,122	215,284
YoY	45.3%	31.4%	3.3%	43.1%	12.4%	-18.0%	11.6%	302.8%	242.4%	133.7%
<b>Cost of revenue</b>	2,609	3,315	3,432	5,006	5,123	4,112	4,916	22,112	82,508	185,663
YoY	56.9%	27.1%	3.5%	45.9%	2.3%	-19.7%	19.6%	349.8%	273.1%	125.0%
Cost ratio	78.0%	75.4%	75.6%	77.1%	70.2%	68.7%	73.6%	82.2%	89.6%	86.2%
<b>Gross profit</b>	738	1,081	1,108	1,489	2,178	1,873	1,762	4,788	9,613	29,621
YoY	15.1%	46.5%	2.5%	34.4%	46.3%	-14.0%	-5.9%	171.7%	100.8%	208.1%
Gross profit margin	22.0%	24.6%	24.4%	22.9%	29.8%	31.3%	26.4%	17.8%	10.4%	13.8%
<b>SG&amp;A expenses</b>	474	660	710	1,374	1,251	1,265	1,400	3,427	8,007	16,816
YoY	8.9%	39.3%	7.6%	93.3%	-8.9%	1.1%	10.7%	144.7%	133.6%	110.0%
SG&A ratio	14.2%	15.0%	15.6%	21.1%	17.1%	21.1%	21.0%	12.7%	8.7%	7.8%
<b>Operating profit</b>	264	420	397	115	927	608	362	1,361	1,605	12,804
YoY	28.4%	59.5%	-5.5%	-71.0%	704.7%	-34.4%	-40.5%	276.4%	17.9%	697.8%
Operating profit margin	7.9%	9.6%	8.8%	1.8%	12.7%	10.2%	5.4%	5.1%	1.7%	5.9%
<b>Non-operating income/expenses</b>	-23	-81	29	-67	-52	-42	-56	-92	-187	1,234
Non-operating income	11	1	47	39	34	64	112	376	769	2,953
Non-operating expenses	34	82	17	106	86	106	169	468	956	1,719
<b>Recurring profit</b>	241	339	427	49	874	566	306	1,269	1,418	14,038
YoY	108.5%	40.9%	25.8%	-88.6%	1700.1%	-35.2%	-46.0%	315.3%	11.7%	890.0%
Recurring profit margin	7.2%	7.7%	9.4%	0.7%	12.0%	9.5%	4.6%	4.7%	1.5%	6.5%
<b>Extraordinary gains/losses</b>	1	28	-39	1	42	15	-1	-15	750	-47
Extraordinary gains	3	28	3	1	74	15	12	1	1,022	339
Extraordinary losses	2		41		32	0	12	16	272	386
<b>Net income</b>	234	200	228	-164	761	327	217	931	1,557	11,928
YoY	101.0%	-14.8%	14.3%	-	-	-57.0%	-33.7%	330.0%	67.2%	666.1%
Net margin	7.0%	4.5%	5.0%	-	10.4%	5.5%	3.2%	3.5%	1.7%	5.5%
<b>Net income attributable to owners of the parent</b>	234	200	231	-176	757	316	211	537	806	4,965
YoY	100.6%	-14.6%	15.8%	-	-	-58.2%	-33.1%	154.2%	50.1%	516.0%
Net margin	7.0%	4.5%	5.1%	-	10.4%	5.3%	3.2%	2.0%	0.9%	2.3%

Source: Shared Research based on company data

Note: Any differences between figures in the table and those in company data are due to rounding

- ▶ The company adopted the Accounting Standard for Revenue Recognition from the beginning of FY06/22. Accordingly, it recognizes revenue at the transfer of promised goods and services to its customers, in an amount reflecting the consideration to which it expects to be entitled in exchange for those goods or services.
- ▶ The company adopted the Accounting Standard for Fair Value Measurement from the beginning of FY06/22. It says there is no impact of this change on its financial statements.

## Balance sheet

Balance sheet	FY06/14	FY06/15	FY06/16	FY06/17	FY06/18	FY06/19	FY06/20	FY06/21	FY06/22	FY06/23
(JPYmn)	Cons.	Cons.	Cons.	Cons.	Cons.	Cons.	Cons.	Cons.	Cons.	Cons.
<b>Assets</b>										
Cash and deposits	494	407	496	672	601	799	1,209	4,722	3,966	20,619
Notes and accounts receivable	408	525	473	335	335	393	303	1,312	6,156	2,011
Merchandise and finished goods	499	263	385	423	327	172	246	6,480	26,740	48,827
Real estate for sale		333	118	73	44	414	1,536	365	768	452
Work in process	115	336	666	2,637	3,659	3,631	4,751	4,462	3,804	4,335
Allowance for doubtful accounts	-11	-10	-22	-204	-219	-1	0	-1	-109	-36
<b>Total current assets</b>	<b>1,715</b>	<b>2,093</b>	<b>2,420</b>	<b>4,692</b>	<b>5,227</b>	<b>6,078</b>	<b>8,553</b>	<b>22,537</b>	<b>57,450</b>	<b>100,049</b>
YoY	86.2%	22.0%	15.6%	93.9%	11.4%	16.3%	40.7%	163.5%	154.9%	74.1%
% of assets	82.8%	82.7%	86.7%	73.3%	72.7%	55.3%	57.9%	57.2%	67.5%	69.6%
Buildings and structures	11	11	11	29	39	116	116	427	569	1,143
Accumulated depreciation	-5	-6	-8	-14	-20	-53	-59	-120	-191	-356
Buildings and structures (net)	6	5	4	15	19	62	58	306	378	786
Machinery, equipment, and vehicles	52	52	51	848	970	2,172	2,649	13,626	19,431	27,463
Accumulated depreciation	-12	-23	-31	-154	-250	-369	-528	-1,492	-3,080	-5,901
Machinery, equipment, and vehicles (net)	39	29	19	694	720	1,803	2,122	12,133	16,351	21,562
Land	64	114	148	472	707	1,033	1,133	1,332	1,791	2,403
Construction in progress						1,330	2,211	1,331	1,757	7,823
<b>Total tangible fixed assets</b>	<b>161</b>	<b>189</b>	<b>223</b>	<b>1,222</b>	<b>1,456</b>	<b>4,239</b>	<b>5,529</b>	<b>15,201</b>	<b>20,507</b>	<b>32,943</b>
YoY	127.5%	17.5%	17.7%	448.6%	19.1%	191.0%	30.4%	174.9%	34.9%	60.6%
% of assets	7.8%	7.5%	8.0%	19.1%	20.3%	38.6%	37.4%	38.6%	24.1%	22.9%
<b>Intangible assets</b>										
YoY	-7.3%	-24.5%	-91.3%	5361.3%	-25.3%	-9.9%	-43.7%	231.8%	1184.4%	60.5%
% of assets	3.9%	2.4%	0.2%	4.5%	3.0%	1.8%	0.7%	0.9%	5.5%	5.2%
Investments and other assets	115	188	142	195	289	459	554	1,268	2,463	3,134
YoY	28.1%	62.9%	-24.0%	36.6%	48.4%	59.1%	20.6%	128.9%	94.2%	27.2%
% of assets	5.6%	7.4%	5.1%	3.0%	4.0%	4.2%	3.8%	3.2%	2.9%	2.2%
<b>Total fixed assets</b>	<b>358</b>	<b>438</b>	<b>371</b>	<b>1,437</b>	<b>1,962</b>	<b>4,893</b>	<b>6,193</b>	<b>16,835</b>	<b>27,659</b>	<b>43,600</b>
YoY	-44.6%	22.6%	-15.4%	287.8%	36.5%	149.4%	26.6%	171.8%	64.3%	57.6%
% of assets	17.2%	17.3%	13.3%	22.5%	27.3%	44.5%	41.9%	42.7%	32.5%	30.3%
<b>Total deferred assets</b>						14	17	16	10	42
<b>Total assets</b>	<b>2,073</b>	<b>2,531</b>	<b>2,790</b>	<b>6,400</b>	<b>7,189</b>	<b>10,985</b>	<b>14,765</b>	<b>39,388</b>	<b>85,121</b>	<b>143,691</b>
YoY	77.3%	22.1%	10.2%	129.4%	12.3%	52.8%	34.4%	166.8%	116.1%	68.8%

Liabilities										
Accounts payable	514	436	529	331	411	533	991	5,058	14,595	16,412
Short-term borrowings	38	194	410	1,027	1,270	1,147	699	6,499	18,356	35,031
Current portion of long-term borrowings	97	122	51	697	800	967	1,071	869	1,266	3,070
Contract liabilities									16,255	27,843
Current portion of long-term accounts payable						75	1,582	2,384	464	460
<b>Total current liabilities</b>	<b>821</b>	<b>1,127</b>	<b>1,368</b>	<b>3,545</b>	<b>3,873</b>	<b>4,641</b>	<b>6,745</b>	<b>26,212</b>	<b>57,721</b>	<b>100,356</b>
Bonds						100	36	116	50	166
Long-term borrowings	297	269	92	1,467	1,139	1,679	3,594	6,105	12,032	13,199
Lease obligations	36	14	32	25	13	8	0	79	10	483
Long-term accounts payable						1,342	1,966	1,828	7,028	6,267
<b>Total fixed liabilities</b>	<b>386</b>	<b>361</b>	<b>203</b>	<b>1,733</b>	<b>1,499</b>	<b>4,312</b>	<b>5,859</b>	<b>8,398</b>	<b>19,452</b>	<b>20,563</b>
<b>Total liabilities</b>	<b>1,207</b>	<b>1,488</b>	<b>1,571</b>	<b>5,279</b>	<b>5,373</b>	<b>8,953</b>	<b>12,605</b>	<b>34,611</b>	<b>77,174</b>	<b>120,920</b>
YoY	12.4%	23.3%	5.6%	236.0%	1.8%	66.6%	40.8%	174.6%	123.0%	56.7%
% of assets	58.2%	58.8%	56.3%	82.5%	74.7%	81.5%	85.4%	87.9%	90.7%	84.2%
Net assets										
Shareholders' equity										
Capital stock	1,069	656	656	701	701	701	702	825	1,243	2,059
Capital surplus	302			45	45	45	47	229	647	1,413
Retained earnings	-507	383	564	333	1,022	1,245	1,368	2,919	3,629	8,486
Treasury stock	0	0	0	-1	-1	-21	-21	-21	-22	-143
<b>Total shareholders' equity</b>	<b>864</b>	<b>1,038</b>	<b>1,219</b>	<b>1,077</b>	<b>1,767</b>	<b>1,969</b>	<b>2,096</b>	<b>3,953</b>	<b>5,497</b>	<b>11,815</b>
Share subscription rights	2	1			2	5	3	13	135	266
Non-controlling interests		3		43	47	58	63	758	1,939	9,909
<b>Total net assets</b>	<b>866</b>	<b>1,043</b>	<b>1,219</b>	<b>1,121</b>	<b>1,816</b>	<b>2,032</b>	<b>2,159</b>	<b>4,777</b>	<b>7,947</b>	<b>22,771</b>
YoY	71.2%	20.4%	16.9%	-8.1%	62.0%	11.9%	6.2%	121.3%	66.4%	186.5%
% of assets	41.8%	41.2%	43.7%	17.5%	25.3%	18.5%	14.6%	12.1%	9.3%	15.8%

Source: Shared Research based on company data

## Cash flow statement

Cash flow statement	FY06/14	FY06/15	FY06/16	FY06/17	FY06/18	FY06/19	FY06/20	FY06/21	FY06/22	FY06/23
(JPYmn)	Cons.	Cons.	Cons.	Cons.	Cons.	Cons.	Cons.	Cons.	Cons.	Cons.
<b>Cash flows from operating activities</b>										
Pre-tax profit	241	367	388	84	917	581	304	1,255	2,168	13,990
Depreciation	32	47	34	54	123	167	188	708	1,457	1,917
Amortization of goodwill	17	17	17		101	107	77	12	147	375
Impairment losses			35		28					237
Interest expenses	15	14	11	18	44	85	111	317	740	1,473
Equity in earnings of affiliates( )	0	18	0	13	8	-2	-27	-19	-26	-425
Foreign exchange gains and losses( )	0	-4	1	0	-5	0	2	-139	49	-1,601
Change in trade receivables	-313	-117	52	138	-1	-214	113	-2,419	-11,424	4,294
Change in inventories( )	-257	14	-451	221	-927	-956	-1,270	-3,399	-16,745	-20,712
Change in trade payables	349	-78	93	-732	79	120	378	3,569	19,793	1,058
Change in advances received	-73	71	62	-583	-16	671	63	-197	-1,238	10,176
Other				320	283	664	-174	292	14,146	
Subtotal	7	139	323	-837	641	391	-647	-240	-4,810	20,867
Interest and dividends income received	0	0	1	1	0	1	0	29	117	102
Interests paid	-15	-14	-12	-17	-44	-85	-114	-298	-754	-1,508
Income taxes paid	-70	-68	-106	-131	-265	-453	-101	-160	-1,002	-1,062
<b>Cash flows from operating activities (1)</b>	<b>-77</b>	<b>57</b>	<b>206</b>	<b>-984</b>	<b>405</b>	<b>-147</b>	<b>-861</b>	<b>-608</b>	<b>-6,449</b>	<b>18,526</b>
<b>Cash flows from investing activities</b>										
Payments into time deposits			-119	-26	-141	-92	-401	-114	-331	-285
Proceeds from withdrawal of time deposits			75	23		41	140	113	96	139
Purchase of tangible fixed assets	-90	-141	-55	-428	-377	-1,473	-117	-2,732	-6,036	-12,400
Purchase of intangible assets	-11	-10	-5	-14	-31	-7	-11	-10	-12	-2,198
Deposits paid									-787	-5,539
Purchase of subsidiaries' shares affecting scope of consolidation				-405		-21			-3,992	-1,450
Loan advances	-12	-92	-105	-12	-44	-154		-431	-980	-124
Proceeds from collection of loans receivable		8	131	12	43	38		10	27	113
Other			-1			-7	-9	-3	-63	-17
<b>Cash flows from investing activities (2)</b>	<b>-116</b>	<b>-252</b>	<b>-75</b>	<b>-864</b>	<b>-559</b>	<b>-1,620</b>	<b>-472</b>	<b>-1,391</b>	<b>-13,221</b>	<b>-20,670</b>
<b>Free cash flow (1+2)</b>	<b>-194</b>	<b>-195</b>	<b>131</b>	<b>-1,848</b>	<b>-155</b>	<b>-1,766</b>	<b>-1,333</b>	<b>-1,999</b>	<b>-19,670</b>	<b>-2,144</b>
<b>Cash flows from financing activities</b>										
Repayments of installment payables			-32	1,983	17	510	1,996	5,176	14,000	16,506
Repayments of short-term borrowings	106	816	1,244	1,508	1,713	2,033	1,979	13,812	46,519	70,923
Repayments of long-term borrowings	-121	-659	-1,028	-891	-1,471	-1,792	-2,130	-10,823	-36,222	-55,275
Proceeds from long-term borrowings		110	70	1,600	671	1,289	3,546	3,625	7,623	5,544
Repayments of long-term borrowings	-104	-114	-317	-235	-896	-1,019	-1,399	-1,438	-3,920	-4,686
Proceeds from issuance of shares			90					224	775	1,399
Dividends paid		-25	-50	-55	-67	-86	-87	-89	-98	-117
<b>Cash flows from financing activities</b>	<b>393</b>	<b>104</b>	<b>-85</b>	<b>1,991</b>	<b>-62</b>	<b>1,913</b>	<b>1,465</b>	<b>5,290</b>	<b>17,752</b>	<b>17,235</b>
Depreciation and amortization (A)	32	47	34	54	123	274	265	720	1,604	2,292
Purchase of tangible fixed assets and intangible assets(B)	-102	-151	-60	-442	-408	-1,480	-128	-2,742	-6,048	-14,598
Change in working capital (C)	198	181	307	2,069	847	-246	648	2,889	14,912	16,654
<b>Simple FCF (NI + A + B - C)</b>	<b>-34</b>	<b>-85</b>	<b>-101</b>	<b>-2,633</b>	<b>-374</b>	<b>-644</b>	<b>-300</b>	<b>-4,374</b>	<b>-18,550</b>	<b>-23,995</b>

Source: Shared Research based on company data

Note: Only main accounting items are listed



# Other information

## History

History	
2000 Apr	Established Real Communications Co., Ltd.
2000 Aug	Moved head office to Chiyoda-ku, Tokyo
2001 Feb	Changed company name to Realcom Co., Ltd.
2005 Feb	Moved head office to Taito-ku, Tokyo
2006 Feb	Established US subsidiary Realcom Technology, Inc. for sales and support services in the US and planning and development of next-generation products
2007 Sep	Listed on the Mothers Market of the Tokyo Stock Exchange (TSE)
2008 Mar	Established US subsidiary Realcom U.S., Inc.
2011 Nov	Made WWB Corporation a wholly owned subsidiary via stock exchange
2012 Sep	Moved head office to Shinagawa-ku, Tokyo
2017 Mar	WWB Corporation established an SPC (VW LLC) and made Valors Corporation a subsidiary
2017 Mar	Changed company name to Abalance Corporation
2018 Feb	WWB Corporation established Fuji Solar Corporation
2018 Nov	Switched listing from the Mothers Market to the Second Section of TSE
2019 Oct	Established Abit Corporation through an incorporation-type split of the IT division
2020 Dec	Made Vietnam Sunergy Joint Stock Company (VSUN) a subsidiary
2021 Jun	WWB Corporation established Birdy Fuel Cells LLC
2021 Oct	WWB Corporation made Campanio Solar Co., Ltd. a subsidiary via second-tier subsidiary, Valors Corporation
2021 Oct	WWB Corporation made Japan Solar Power Co., Ltd. a subsidiary
2021 Nov	WWB Corporation succeeded the industrial-use solar power generation business from Japan Life Support Co., Ltd.
2022 Mar	Abit Corporation made Digital Sign Co., Ltd. a subsidiary
2022 Mar	WWB Corporation made Japan Mirai Energy Co., Ltd. and J. Mirai Co., Ltd. subsidiaries via second-tier subsidiary, WWB Solar 03 LLC
2022 Mar	Made Meiji Machine Co., Ltd. an equity-method affiliate

Source: Shared Research based on company data

## Major shareholders

Mr. Junsei Ryu has been Abalance's major shareholder since the company made WWB Corporation a wholly owned subsidiary through a share exchange conducted in November 2011. The company has no business ties with the other individual and corporate shareholders shown below.

### As of end-FY06/23

Major shareholders	Shares held(year-end; '000)	Shareholding ratio
Junsei Ryu	5,460	31.41%
Iizuka Future Design Co., Ltd.	645	3.71%
BNY GCM CLIENT ACCOUNT JPRD AC ISG (FE-AC)	487	2.80%
Yutaka Hino	485	2.79%
SBI Securities Co., Ltd.	463	2.66%
Heishiro Gen	410	2.35%
Hiroshi Yamashita	314	1.80%
Jingukan	291	1.67%
Arata Takahashi	264	1.51%
Yoshie Iizuka	176	1.01%
Total	8,995	51.71%

Source: Shared Research based on company data

## Dividend policy

Abalance's basic policy is to accomplish stable dividend payments and actively return profits to shareholders in accordance with the state of its finances, while maintaining the necessary internal reserves to develop future businesses and strengthen the company's financial position. Abalance pays dividends twice a year as an interim dividend and year-end dividend.

## Top management

Title	Representative director and president
Name	Yasuaki Mitsuyuki
Date of birth	January 4, 1951
1974 Apr	Joined The Industrial Bank of Japan, Limited
2000 Jun	General manager of inspection, The Industrial Bank of Japan, Limited.
2003 Apr	General manager of sales, Drake Beam Morin-Japan Inc.
2005 Jan	Director and senior managing director, Daishinto Inc.
2009 Jun	Director, Shidax Corporation
2010 Jul	Special advisor, Shidax Corporation
2011 Jan	Director, SFP Dining Co., Ltd.
2011 Oct	Managing director, SFP Dining Co., Ltd.
2013 Jan	Director and executive vice president, SFP Dining Co., Ltd.
2016 Jun	Outside director, Edoichi Co., Ltd.
2017 Sep	Outside audit & supervisory board member, Novarese Co., Ltd.
2018 Sep	Representative director and president of the company (current position)
2018 Sep	Director, WWB Corporation (current position)
2018 Sep	Director, Valors Corporation (current position)
2018 Sep	Director, Valors Engineering Corporation (current position)

Source: Shared Research based on company data

Title	Director
Name	Junsei Ryu
Date of birth	October 21, 1971
2003 Feb	Founding representative director, J-TEC YK
2006年6月	Founding representative director, WWB Corporation (current position)
2011年11月	Representative director of the company
2016年9月	Director of the company (current position)
2017年3月	Representative director, Valors Corporation (current position)
2017年3月	Representative director, Valors Engineering Corporation (current position)
2018年4月	Chairman of the board, Vietnam Sunergy Company Limited (current position)
2019年1月	Representative director, Japan Photocatalyst Center Corporation (current position)
2022年11月	Chairman of the board, Vietnam Sunergy Cell Company Limited (current position)

Source: Shared Research based on company data

## Company philosophy

The Abalance group envisions becoming an "excellent creative company" by providing value. It aspires to contribute to the sustainable progress of society on an ongoing basis by improving social lifestyles through value creation, focusing on the provision of advanced products, businesses, and services.

## Corporate governance

At its ordinary general meeting of shareholders held in September 2020, Abalance made a proposal to revise its articles of incorporation and shift to a company with an audit and supervisory committee, with an aim to further enhancing corporate governance and raising its corporate value. With the passing of this resolution, the company transitioned from a company with an audit and supervisory board to one with an audit and supervisory committee.

Form of organization and capital structure	
Form of organization	Company with Audit & Supervisory Committee
Controlling shareholder(excluding parent company)	-
Parent company	None
Directors and Audit & Supervisory Committee	
Number of directors under Articles of Incorporation	8
Number of directors	5
Directors' term of office under Articles of Incorporation	1 year
Chairperson of the Board of Directors	President
Number of outside directors	3
Number of independent outside directors	3
Number of auditors under Articles of Incorporation	-
Number of members of Audit & Supervisory Committee	3
Number of outside directors(Audit & Supervisory Committee)	3
Number of independent outside members of Audit & Supervisory Committee	-
Other	Other
Participation in electronic voting platform	No
Providing convocation notice in English	None
Implementation of measures regarding director incentives	Stock option
Eligible for stock option	Inside directors, Outside directors, Employees, Directors of subsidiaries, Employees of subsidiaries, Other
Disclosure of directors' compensation	None
Policy to determine amount and calculation method of remuneration	Y
Corporate takeover defenses	None

Source: Shared Research based on company data

## Basic policy on sustainability

The Abalance group understands that addressing sustainability related to climate change and other global environmental issues is a highly important theme. In terms of the UN sustainable development goals (SDGs), the company is chiefly committed to goals 7, 11, and 13, which it plans to contribute to by providing safe and secure clean energy. The company also actively works toward goal 3 (Good Health and Well-being) through its photocatalyst and other healthcare-related businesses.

# Profile

Company Name

**Abalance Corporation**

Phone

**03-6810-3028**

Established

**2000-04-17**

IR Contact

<https://www.abalance.jp/en/contact>

Head Office

**2-2-4 Higashishinagawa Shinagawa-Ku, Tokyo 140-0002**

Listed On

**Tokyo Stock Exchange, Standard Market**

Exchange Listing

**2007-09-19**

Fiscal Year-End

**Jun**

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We offer corporate clients comprehensive report coverage, a service that allows them to better inform investors and other stakeholders by presenting a continuously updated third-party view of business fundamentals, independent of investment biases. Shared Research can be found on the web at <https://sharedresearch.jp>.

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