A large blue circular logo with a white "R" inside, surrounded by radiating lines and small blue circles.

SR Research Report  
2015/7/24

## Tamagawa Holdings Co., Ltd. (6838)

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Income Statement (JPYmn)	FY03/10 Cons.	FY03/11 Cons.	FY03/12 Cons.	FY03/13 Cons.	FY03/14 Cons.	FY03/15 Cons.	FY03/16 Est.
<b>Total Sales</b>	<b>2,803</b>	<b>2,640</b>	<b>3,106</b>	<b>3,672</b>	<b>4,171</b>	<b>5,095</b>	<b>5,600~7,300</b>
YoY	-34.8%	-5.8%	17.7%	18.2%	13.6%	22.1%	11.0~43.8%
<b>Gross Profit</b>	<b>392</b>	<b>326</b>	<b>590</b>	<b>1,049</b>	<b>1,198</b>	<b>1,479</b>	
YoY	-58.8%	-16.8%	81.1%	77.8%	14.3%	23.4%	
GPM	14.0%	12.3%	19.0%	28.6%	28.7%	29.0%	
<b>Operating Profit</b>	<b>-227</b>	<b>-286</b>	<b>-30</b>	<b>373</b>	<b>477</b>	<b>531</b>	<b>590~850</b>
YoY	-	-	-	-	27.8%	11.3%	11.2~61.2%
OPM	-8.1%	-10.8%	-1.0%	10.2%	11.4%	10.4%	
<b>Recurring Profit</b>	<b>-224</b>	<b>-284</b>	<b>-24</b>	<b>375</b>	<b>478</b>	<b>514</b>	<b>520~790</b>
YoY	-	-	-	-	27.6%	7.5%	2.0~53.7%
RPM	-8.0%	-10.8%	-0.8%	10.2%	11.5%	10.1%	
<b>Net Income</b>	<b>-570</b>	<b>-351</b>	<b>-37</b>	<b>340</b>	<b>436</b>	<b>427</b>	<b>400~570</b>
YoY	-	-	-	-	28.5%	-2.2%	-5.6~34.9%
Net Margin	-20.3%	-13.3%	-1.2%	9.3%	10.5%	8.4%	
<b>Per Share Data</b>							
Number of Shares (thousands)	6,774	6,774	6,774	10,753	41,259	42,031	-
EPS	-35.1	-17.8	-1.9	15.7	11.7	10.4	10.0~14.0
EPS (Fully Diluted)	-	-	-	14.8	10.6	10.2	-
Dividend Per Share	-	-	-	-	-	1	1.0~3.0
Book Value Per Share	58.9	40.6	38.6	54.3	64.8	75.4	
<b>Balance Sheet</b>							
Cash and Equivalents	665	493	56	390	1,764	1,524	
<b>Total Current Assets</b>	<b>1,918</b>	<b>1,530</b>	<b>1,293</b>	<b>2,114</b>	<b>3,421</b>	<b>3,606</b>	
Tangible Fixed Assets, net	295	205	133	564	718	2,410	
Other Fixed Assets	89	30	18	27	38	154	
Intangible Assets	39	-	-	1	31	194	
<b>Total Assets</b>	<b>2,341</b>	<b>1,766</b>	<b>1,445</b>	<b>2,709</b>	<b>4,210</b>	<b>6,376</b>	
Accounts Payable	443	430	364	386	474	620	
Short-Term Debt	433	203	30	40	323	300	
<b>Total Current Liabilities</b>	<b>1,026</b>	<b>884</b>	<b>598</b>	<b>708</b>	<b>1,130</b>	<b>1,481</b>	
Long-Term Debt	67	-	-	151	294	539	
<b>Total Fixed Liabilities</b>	<b>153</b>	<b>83</b>	<b>85</b>	<b>251</b>	<b>442</b>	<b>1,733</b>	
<b>Total Liabilities</b>	<b>1,179</b>	<b>967</b>	<b>683</b>	<b>959</b>	<b>1,572</b>	<b>3,215</b>	
<b>Net Assets</b>	<b>1,162</b>	<b>799</b>	<b>761</b>	<b>1,751</b>	<b>2,638</b>	<b>3,161</b>	
Interest-Bearing Debt	500	203	30	192	618	839	
<b>Cash Flow Statement</b>							
Operating Cash Flow	-1	68	-332	36	764	387	
Investment Cash Flow	12	93	77	-454	-265	-865	
Financing Cash Flow	-82	-299	-168	783	875	238	
<b>Financial Ratios</b>							
ROA	-8.4%	-13.8%	-1.5%	18.0%	13.8%	9.7%	
ROE	-43.4%	-35.8%	-4.7%	27.1%	19.9%	14.7%	
Equity Ratio	49.6%	45.3%	52.7%	64.6%	62.7%	49.6%	

Source: Company data

Figures may differ from company materials due to differences in rounding methods.



## Recent updates

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### Highlights

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On **July 24, 2015**, Tamagawa Holdings Co., Ltd. released the update on its geothermal power plant operations.

On December 26, 2014, the company had announced that it was planning to kick off selling electricity of its geothermal power plant in August 2015. However, it now states that this may be pushed back, because of a surge in applications for grid connections to its geothermal power plant in Beppu, Oita Prefecture, where it is driving geothermal business while engaging in grid-connection talks with Kyushu Electric Power Co. This has created a potential need to procure voltage regulators (SVCs, or Static Voltage Controllers) in the grid-connection project with Kyushu Electric to begin selling power.

Tamagawa has already completed the negotiation stage for grid connection with Kyushu Electric and has received confirmation that it can proceed with the connection. Going forward, the company will crystallize timelines for the completion date and the selling start date based on the detailed blueprint for grid connection by Kyushu Electric.

On **June 11, 2015**, the company announced the progress of a business alliance with Etrion Japan KK.

The company has concluded a Memorandum of Understanding regarding the business alliance with Etrion Japan, and the two companies have discussed the process for establishing a solar power business in Misawa, Aomori. Both parties have now agreed upon a Term Sheet setting forth the specific process for this business and each company's stake. The company is analyzing the effect of this alliance on earnings for FY03/16 and plans to make an announcement as soon as possible.

#### Key points

- The two companies will establish a special-purpose company (SPC) for this joint business.
- Tamagawa may hold a stake of up to 30% in the SPC.
- The two companies aim to complete all procedures necessary to begin construction by December 2015.
- The two companies will jointly decide the method of funding and appoint engineering, procurement, and construction agents.

#### Overview of the power plant

Location:	Misawa, Aomori
Operator:	GP Energy A, GP Energy B, GP Energy C, GP Energy D (wholly owned units)
Premises:	153,000sqm
Capacity:	10MW
Feed-in tariff:	JPY36/kWh (before tax; fixed for 20 years)
Revenue:	JPY390mn a year (estimate)
First year output:	10,852,814 kWh (estimate)

On **May 13, 2015**, the company announced earnings results for full-year FY03/15; see the results section for details.

On **May 12, 2015**, the company announced a reduction in capital reserves and the distribution of a surplus.



At a meeting of the board of directors held on the same day, the company resolved to reduce capital reserves by JPY200mn and transfer the entire amount to the capital surplus account. It plans to use JPY41mn of the increase in capital surplus to pay a dividend of JPY1 per share. The aim of the above is to secure shareholder return, and ensure a flexible capital policy in future.

The planned record date for this distribution is March 31, 2015, provided the proposal to reduce capital reserves is approved at the general meeting of shareholders on June 26, 2015, and the necessary procedures to protect creditors are completed.

**For corporate releases and developments more than three months old, please refer to the News and topics section.**



## Trends and outlook

### Quarterly trends and results

Quarterly Performance (cumulative) (JPYmn)	FY03/14				FY03/15				FY03/15	
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	% of FY Est.	FY Est.
Sales	914	1,820	2,738	4,171	835	1,924	3,101	5,095	101.8%	5,004
YoY	23.9%	14.5%	7.8%	13.6%	-8.7%	5.7%	13.3%	22.1%		20.0%
Gross Profit	253	547	848	1,198	261	617	996	1,479		
YoY	51.0%	35.7%	15.1%	14.3%	3.0%	12.8%	17.4%	23.4%		
GPM	27.7%	30.0%	31.0%	28.7%	31.2%	32.1%	32.1%	29.0%		
SG&A Expenses	164	332	532	721	204	405	624	947		
YoY	10.2%	7.3%	9.7%	6.8%	24.0%	22.0%	17.4%	31.4%		
SG&A / Sales	17.9%	18.2%	19.4%	17.3%	24.4%	21.0%	20.1%	18.6%		
Operating Profit	89	215	317	477	57	212	372	531	102.8%	517
YoY	371.9%	129.2%	25.6%	27.8%	-35.8%	-1.3%	17.6%	11.3%		8.4%
OPM	9.8%	11.8%	11.6%	11.4%	6.9%	11.0%	12.0%	10.4%		10.3%
Recurring Profit	95	219	319	478	56	210	364	514	101.4%	507
YoY	847.7%	163.0%	32.3%	27.6%	-40.8%	-4.1%	14.2%	7.5%		6.0%
RPM	10.4%	12.0%	11.6%	11.5%	6.8%	10.9%	11.7%	10.1%		10.1%
Net Income	90	191	305	436	26	120	261	427	93.9%	455
YoY	939.0%	108.7%	23.2%	28.5%	-71.1%	-36.9%	-14.5%	-2.2%		4.2%
Net Margin	9.8%	10.5%	11.1%	10.5%	3.1%	6.3%	8.4%	8.4%		9.1%

Quarterly Performance (JPYmn)	FY03/14				FY03/15			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Sales	914	906	918	1,433	835	1,089	1,178	1,993
YoY	23.9%	6.3%	-3.4%	26.7%	-8.7%	20.1%	28.3%	39.1%
Gross Profit	253	293	301	350	261	356	379	482
YoY	51.0%	24.7%	-9.6%	12.2%	3.0%	21.3%	25.8%	37.8%
GPM	27.7%	32.4%	32.8%	24.4%	31.2%	32.7%	32.2%	24.2%
SG&A Expenses	164	167	200	190	204	201	220	323
YoY	10.2%	4.5%	14.1%	-0.7%	24.0%	20.0%	9.7%	70.5%
SG&A / Sales	17.9%	18.5%	21.8%	13.2%	24.4%	18.5%	18.6%	16.2%
Operating Profit	89	126	101	161	57	155	160	159
YoY	371.9%	68.0%	-35.9%	32.5%	-35.8%	23.2%	57.6%	-0.9%
OPM	9.8%	13.9%	11.0%	11.2%	6.9%	14.2%	13.6%	8.0%
Recurring Profit	95	124	100	159	56	154	154	150
YoY	847.7%	69.1%	-36.6%	19.1%	-40.8%	24.1%	54.5%	-6.1%
RPM	10.4%	13.7%	10.9%	11.1%	6.8%	14.1%	13.1%	7.5%
Net Income	90	101	114	131	26	94	141	166
YoY	939.0%	22.0%	-26.8%	42.6%	-71.1%	-6.6%	22.9%	26.6%
Net Margin	9.8%	11.1%	12.5%	9.2%	3.1%	8.7%	11.9%	8.3%

Source: Company data

Figures may differ from company materials due to differences in rounding methods.



Segment Breakdown (cumulative) (JPYmn)	FY03/14				FY03/15			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Sales	914	1,820	2,738	4,171	835	1,924	3,101	5,095
YoY	23.9%	14.5%	7.8%	13.6%	-8.7%	5.7%	13.3%	22.1%
Electronics and Telecoms Equipment	692	1,382	2,235	3,230	777	1,741	2,748	3,401
YoY	-0.1%	-2.5%	-2.7%	2.3%	12.2%	26.0%	22.9%	5.3%
Solar System Sales	222	415	467	890	33	137	293	1,606
YoY	-	320.9%	179.1%	101.8%	-85.2%	-67.0%	-37.1%	80.4%
Solar Power Plant Operations	-	23	36	52	25	45	60	88
YoY	-	-	-	-	-	93.3%	63.9%	70.7%
Geothermal Power Plant Operations	-	-	-	-	-	-	-	-
Operating Profit	89	215	317	477	57	212	372	531
YoY	371.9%	129.2%	25.6%	27.8%	-35.8%	-1.3%	17.6%	11.3%
Electronics and Telecoms Equipment	82	188	327	480	93	257	435	467
YoY	88.6%	26.8%	3.9%	28.1%	13.7%	36.8%	33.0%	-2.7%
Solar System Sales	25	48	32	51	-10	-6	-19	112
YoY	-	-	-	-5.5%	-	-	-	118.6%
Solar Power Plant Operations	-8	-14	-21	-20	10	16	16	22
YoY	-	-	-	-	-	-	-	-
Geothermal Power Plant Operations	-	-	-	-	-	-	-	-
Total	99	222	338	512	93	268	432	602
Adjustments	-10	-7	-22	-35	-36	-55	-60	-70
Segment Breakdown (quarterly) (JPYmn)	FY03/14				FY03/15			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Sales	914	906	918	1,433	835	1,089	1,178	1,993
YoY	23.9%	6.3%	-3.4%	26.7%	-8.7%	20.1%	28.3%	39.1%
Electronics and Telecoms Equipment	692	690	853	994	777	964	1,007	652
YoY	-0.1%	-4.7%	-3.2%	16.0%	12.2%	39.8%	18.0%	-34.4%
Solar System Sales	222	193	52	424	33	104	157	1,313
YoY	-	144.4%	-24.6%	54.6%	-85.2%	-46.0%	202.4%	209.8%
Solar Power Plant Operations	-	23	13	15	25	20	14	28
YoY	-	-	-	-	-	-14.2%	10.1%	86.8%
Geothermal Power Plant Operations	-	-	-	-	-	-	-	-
Operating Profit	89	126	101	161	57	155	160	159
YoY	371.9%	68.0%	-35.9%	32.5%	-35.8%	23.2%	57.6%	-0.9%
Electronics and Telecoms Equipment	82	106	139	153	93	164	178	32
YoY	88.6%	1.3%	-16.5%	156.1%	13.7%	54.5%	27.9%	-79.0%
Solar System Sales	25	23	-15	19	-10	5	-13	131
YoY	-	-	-	-77.4%	-	-79.4%	-	590.8%
Solar Power Plant Operations	-8	-6	-8	1	10	6	-0	7
YoY	-	-	-	-	-	-	-	349.3%
Geothermal Power Plant Operations	-	-	-	-	-	-	-	-
Total	99	123	116	173	93	175	165	169
Adjustments	-10	3	-15	-13	-36	-20	-5	-10

Source: Company data

Figures may differ from company materials due to differences in rounding methods.

**FY03/15 results (announced May 13, 2015; see preceding table)**

Sales: JPY5.1bn (+22.1% YoY)  
 Operating profit: JPY531mn (+11.3%)



Recurring profit: JPY514mn (+7.5%)  
Net income: JPY427mn (-2.2%)

**Electronics and Telecoms Equipment**

Orders: JPY3.2bn (-7.8% YoY)  
Sales: JPY3.4bn (+5.3%)  
Operating profit: JPY467mn (-2.7%)

Mobile telecom providers increased their investments in wireless facilities at the beginning of 2H. However, they changed construction plans during Q4.

The company sought to win new orders in the area of 3.9-generation mobile facilities, defense facilities, and public wireless facilities. The company at the same time installed a new high-definition monitoring system for use at its group solar-power plants.

**Solar System Sales**

Orders: JPY1.7bn (+102.8% YoY)  
Sales: JPY1.8bn (+101.8%)  
Operating profit: JPY112mn (+118.6%)

The company streamlined its operations and expanded sales reach to all parts of the country.

**Solar Power Plant Operations**

Sales: JPY87mn (+70.7% YoY)  
Operating profit: JPY22mn (operating loss of JPY19mn a year earlier)

Sales of electricity at the Shimonoseki solar park were in line with targets. Plants in Tateyama and Sodegaura (both in Chiba Prefecture) began operations in February and March 2015.

**Geothermal Power Plant Operations**

This segment was created during FY03/15. The company is preparing to start operations of geothermal power plants during FY03/16. No sales were recorded, and operating loss was zero.

**Q3 FY03/15 results (announced February 13, 2015)**

Sales: JPY3.1bn (+13.3% YoY)  
Operating profit: JPY372mn (+17.6%)  
Recurring profit: JPY364mn (+14.2%)  
Net income: JPY261mn (-14.8%)

Net income declined year-on-year because robust revenues in recent years eliminated losses carried forward at subsidiaries, meaning income tax returned to a normal level.

**Electronics and Telecoms Equipment**

Orders: JPY2.7bn (-4.9% YoY)  
Sales: JPY2.7bn (+22.9%)  
Operating profit: JPY435mn (+33.0%)

Operating profit exceeded the company's initial full-year forecast of JPY370mn.





Mobile telecoms companies changed construction plans, resulting in lower orders year-on-year, but a recovery has been underway beginning in 2H FY03/15. According to the company, some sales to mobile telecoms companies were brought forward to Q3, meaning sales are unlikely to increase year-on-year in Q4. Public expenditure on defense facilities and public wireless facilities continued.

Tamagawa secured orders in its new business, testing equipment for power semiconductors. It expects to report sales in FY03/16. The company also promoted its new optical transmission device for high-definition video to companies that plan exhibitions, nursing facilities, and security companies, as part of its focus on winning orders in this business.

#### Solar System Sales

Orders: JPY1.5bn (+107.5% YoY)  
Sales: JPY293mn (-37.1%)  
Operating loss: JPY18mn (operating profit of JPY32mn in Q3 FY03/14)

Although the company worked to make sales operations more efficient, there were shipment delays as clients pushed back construction commencement dates. Sales and profits were down year-on-year as a result.

Initial forecasts called for full-year segment sales of JPY1.0bn and operating profit of JPY104mn. As of Q3, the company has achieved 28.8% of its sales target, and has booked an operating loss. According to the company, it may still achieve its targets due to the division and sale of solar parks in Q4 (January to March 2015). Specifically, the company expects to book sales of about JPY900mn and operating profit of about JPY90mn from the division and sale of solar parks in Yokohama (Kanagawa Prefecture), Kagoshima Prefecture, and Nagasaki Prefecture, after having first bought the land and constructed the facilities.

#### Solar Power Plant Operations

Sales: JPY59mn (+63.8% YoY)  
Operating profit: JPY15mn (operating loss of JPY21mn in Q3 FY03/14)

Sales of electricity at the Shimonoseki solar park were in line with targets, yielding higher sales and profits year-on-year.

The company expects to complete construction on a 2.0MW output solar park in Tateyama (Chiba Prefecture) and a 1.3MW output solar park in Sodegaura (Chiba Prefecture) during this year, FY03/15.

#### Geothermal Power Plant Operations

Newly established during Q3 FY03/15, this segment is working to commence operations of geothermal power plants as soon as possible. No sales were recorded, and due to miscellaneous expenses, the company booked an operating loss of JPY0mn for the segment.

The company also plans to construct a geothermal power plant across seven plots in Beppu (Oita Prefecture) with a total output of about 875kW. According to the company, this is equivalent to a solar park with an output of about 7MW, as each geothermal plot of 125kW or so provides the same amount of electricity as a solar power plant with an output of about 1MW. The company plans to bring the new facility online in FY03/16, and is targeting electricity sales of about JPY250mn per year.

#### 1H FY03/15 results (announced November 12, 2014)

Sales: JPY1.9bn (+5.7% YoY)  
Operating profit: JPY212mn (-1.3%)



Recurring profit: JPY210mn (-4.1%)  
Net income: JPY120mn (-36.9%)

**Electronics and Telecoms Equipment**

Orders: JPY1.8bn (+8.3% YoY)  
Sales: JPY1.7bn (+26.0%)  
Operating profit: JPY257mn (+36.8%)

In Q1 FY03/15 (April-June), mobile telecoms companies changed construction plans, resulting in a slow start for base station-related capex. But orders began growing year-on-year in Q2 (July-September), and overall base station-related sales for 1H were up 11.2% YoY. Sales related to public expenditure for defense facilities and public wireless facilities were up 52.1% and 16.3% YoY, respectively. The company's focus on proposals for high-end products paid off, as these high-margin products contributed JPY696mn to sales (+67.7% YoY).

Demand related to fire trucks and regional disaster prevention wireless systems also contributed to growth in public wireless facilities-related sales.

R&D spending increased by JPY46mn YoY to JPY105mn, resulting in a 1.7pp drop in segment OPM, to 11.9%.

**Solar System Sales**

Orders: JPY152mn (-58.4% YoY)  
Sales: JPY136mn (-67.0%)  
Operating loss: JPY5mn (operating profit of JPY47mn in 1H FY03/14)

Although the company worked to make sales operations more efficient, there were shipment delays as clients pushed back construction commencement dates.

**Solar Power Plant Operations**

Sales: JPY45mn (+93.2% YoY)  
Operating profit: JPY16mn (operating loss of JPY13mn in 1H FY03/14)

Sales of electricity at the Shimonoseki solar park were in line with targets.

**Q1 FY03/15 results (announced August 11, 2014)**

Sales: JPY835mn (-8.7% YoY)  
Operating profit: JPY57mn (-35.8%)  
Recurring profit: JPY56mn (-40.8%)  
Net income: JPY26mn (-71.1%)

Operating profit fell as solar system sales dropped YoY and SG&A expenses increased due to higher costs for strengthening compliance and fundraising.

**Electronics and Telecoms Equipment**

This segment saw delayed capex spending from mobile telecoms companies as construction plans were reevaluated for base stations, while public expenditure for defense facilities and public wireless facilities continued. Orders received totaled JPY779mn (+2.8% YoY), sales were JPY776mn (+12.2%), and operating profit was JPY92mn (+13.7%).

The company exhibited its electronics and telecoms equipment at the EXPO COMM WIRELESS JAPAN



2014 trade fair, held in May 2014. Tamagawa said that inquiries about its products from new clients and sectors have increased following the exposition.

### Solar System Sales

Although the company worked to make sales operations more efficient, there were shipment delays due to construction commencement dates being pushed back. More application for equipment approval, due to a revision in feed-in-tariffs and the consumption tax hike, meant grid-connection to electric power companies was prolonged. As a result, orders received were JPY141mn (-21.2% YoY), sales were JPY32mn (-85.2%), and operating loss was JPY10mn (operating profit of JPY25mn in Q1 FY03/14). The company expects to book sales in FY03/15 without the prolonged grid connection that affected sales this quarter.

### Solar Power Plant Operations

Sales of electricity at the Shimonoseki solar park were strong and proceeded according to plans. For the segment overall, sales were JPY25mn (no sales recorded in Q1 FY03/14) and operating profit was JPY10mn (operating loss of JPY7mn in Q1 FY03/14).

**For details on previous annual results, please refer to the Historical financial statements section.**

## Full-year (FY03/16) outlook

FY03/16 Forecast (JPYmn)	FY03/15			FY03/16 FY Est.
	1H Act.	2H Act.	FY Act.	
<b>Sales</b>	<b>1,924</b>	<b>3,171</b>	<b>5,095</b>	<b>5,600~7,300</b>
CoGS	1,307	2,309	3,616	
<b>Gross Profit</b>	<b>617</b>	<b>862</b>	<b>1,479</b>	
GPM	32.1%	27.2%	29.0%	
SG&A	405	543	947	
SG&A/Sales	21.0%	17.1%	18.6%	
<b>Operating Profit</b>	<b>212</b>	<b>319</b>	<b>531</b>	<b>590~850</b>
OPM	11.0%	10.1%	10.4%	-
<b>Recurring Profit</b>	<b>210</b>	<b>304</b>	<b>514</b>	<b>520~790</b>
RPM	10.9%	9.6%	10.1%	-
<b>Net Income</b>	<b>120</b>	<b>307</b>	<b>427</b>	<b>400~570</b>
Net Margin	6.3%	9.7%	8.4%	-

Source: Company data

Figures may differ from company materials due to differences in rounding methods.

### FY03/16 forecast

Sales: JPY5.6bn to JPY7.3bn (+11.0–43.8% YoY)  
Operating profit: JPY590mn to 850mn (+11.2–61.2% YoY)  
Recurring profit: JPY520mn to 790mn (+2.0–53.7% YoY)  
Net income: JPY400mn to 570mn (-5.6–34.9%YoY)



## Long-term outlook

In April 2013, Tamagawa announced its medium-term plan effective through FY03/18. The plan called for sales of JPY10.0bn, an operating profit margin of 20% and ROE of 20%. The company has not announced any medium-term plans since then. Given the changes that have occurred since the time of that announcement—business environment fluctuations, growing revenue opportunities and revised fundraising conditions—Shared Research believes Tamagawa is on track toward its targets. For FY03/17, we expect Tamagawa to generate sales of JPY9.0bn, recurring profit of JPY1.6bn and net income of JPY1.0bn.

Tamagawa expects several factors to drive earnings growth: higher sales from the Electronics and Telecoms Equipment segment; sales of electricity from solar and geothermal power plants that currently are or will become operational; and the partial or entire sale of some of its solar power plant equipment and geothermal power plants. Shared Research's forecast does not take into account profits on the sale of solar modules in the Solar System Sales segment, as such sales are provisional.

Long-Term Outlook (JPYmn)		FY03/15 CE	FY03/16 SR Est.	FY03/17 SR Est.
Sales	Electronics and Telecoms Equipment	3,420	3,700	4,300
	YoY	5.9%	8.2%	16.2%
	Renewable Energy	1,584	1,800	4,800
	YoY	68.2%	13.6%	166.7%
	Group Total	5,004	5,500	9,100
YoY	20.0%	9.9%	65.5%	
Operating Profit	Electronics and Telecoms Equipment	465	400	430
	YoY	-3.2%	-14.0%	7.5%
	Renewable Energy	129	400	1,150
	YoY	308.7%	210.1%	187.5%
	Group Total	517	800	1,580
YoY	8.4%	54.7%	97.5%	
Net Income		455	640	1,030
YoY		4.2%	40.7%	60.9%

Source: Company data

Figures may differ from company materials due to differences in rounding methods.

Renewable Energy includes solar system sales, solar power plant, and geothermal power generation operations.

## Electronics and Telecoms Equipment

Since Masanori Kobayashi—CEO of Tamagawa Electronics—became a director at Tamagawa Holdings in June 2011, the plan has been to exit unprofitable projects, strengthen R&D, and launch new products to expand sales, while stepping up sales of more profitable Tamagawa-brand products. The company anticipates higher demand for devices used in mobile telecoms base stations, alongside devices for defense, disaster prevention, and environmental analysis:

- Mobile network operators (MNOs) are likely to accelerate base station upgrades as they launch LTE-Advanced high-speed data transmission services around 2016. The company's partnership with Ace Technologies has enabled mass production, short lead times, and large-lot production of low cost components. According to the company, in preparation for the 2020 Tokyo Summer Olympics there is expected to be an increase in demand, driven by demand for small-cell infrastructure that can handle



high-speed data traffic.

- Tamagawa expects demand to rise in connection with high-frequency wireless technology applications in new areas. Demand is growing in Japan's defense systems industry as ongoing territorial issues increase the need for high-definition-image coastal monitoring. In this context Tamagawa wants to develop millimeter-wave radio and signal processing systems.
- To harness growing demand for environmental measurement systems, the company plans to accelerate development of its own products used for detection and analysis of airborne pollen, loess particles (carried by the jetstream from the Yellow River region of China), fine particulates (PM<sub>2.5</sub>) and radioactive contamination. In line with achieving profitability at subsidiary Tamagawa Electronics, the company increased investments in R&D. As a result, a solid framework for new product proposal and development has emerged, pushing up the sales composition of internally developed products. Products developed in-house accounted for 30% of sales in FY03/13 and 40% in FY03/14; the company aims to increase this figure further, to over 40% during FY03/15.

In March 2015, Tamagawa plans to establish a second-tier subsidiary in Vietnam, Tamagawa Electronics Vietnam Co., Ltd. The company intends to sell quality products for lower prices by manufacturing high frequency devices. It projects capex of about JPY25mn related to this initiative, plus the cost of leasing land and buildings for a manufacturing plant in Vietnam in an industrial park for Japanese companies.

### Solar Systems Sales

In June 2014, payment was not made by Ise Foods Inc. president and chairman Hikonobu Ise for a third party share issuance, rights to these shares were forfeited. As a result, a business and capital alliance between the company, Hikonobu Ise, and Yukihiro Akimoto, president of Retail Branding Co., Ltd. was canceled. The agreement was planned to allow for development of solar power generation facilities on land owned by Ise Foods. However, in the same month, Tamagawa Holdings entered into a business and capital alliance with Ise Power, for which Yukihiro Akimoto serves as president, and Hikonobu Ise serves as chairman. Ise Power plans to develop solar power generation facilities on land owned by Ise Foods, and Shared Research believes that this agreement will allow for the company to be a supplier of solar power equipment.

Ise Power has applied for a feed-in tariff rate of JPY36 / kWh, and its renewable power generation facilities have been approved by the Ministry of Economy, Trade and Industry. Locations that have been approved for development for sale of electricity to power companies span 27 locations in 10 prefectures, for a total land area of up to 1.4mn sqm. This will allow for installation of solar power generation equipment capable of generating up to 76.5MW of power. Additionally, 30 other locations are currently pending approval at a feed-in tariff rate of JPY32 / kWh.

Shared Research thinks that sales of Solar Power Systems resulting from the alliance with Ise Power will be a significant contributor to earnings results for Tamagawa Holdings from FY03/16 onward.

Ise Foods Inc. was founded in 1914 and is the largest producer of chicken eggs in Japan. It is also the largest producer of chicken eggs on the east coast of the US, and is expanding operations on the west coast as well.



## Solar Power Generation

### Generating capacity of solar power plants

As of November 2014, the company's solar power facilities, including those already in operation and planned facilities on secured land, had a combined generating capacity of 11.4MW (see "Solar power plant generation in Business section"). According to the company, starting with the Tateyama, Chiba plant, it has pushed up the internal rate of return (IRR) on solar power systems by acquiring and building them through leases. The average IRR on these plants is 13.4%, and the average net present value of expected future cash flows is JPY3.2bn.

In December 2014, Tamagawa acquired from ISE Power the rights to produce power in the city of Misawa, Aomori Prefecture, reaching a decision to build and operate a solar power plant there. When operations commence in March 2016, Tamagawa expects the Misawa power plant to have around 10MW of generation capacity, adding some JPY390mn to annual earnings.

The company is also negotiating and investigating the construction of 15 more solar power plants as shown in the table below, with total potential capacity of 61.6MW (including 43.6MW already approved for grid connection by power companies). These projects are yet to be confirmed, and potential capacity will vary depending on negotiations with land owners and the size of investments available to the company. Per Tamagawa's calculations, the total net present value of future cash flows (after subtracting Tamagawa's investment) from all potential projects is JPY14.3bn.

Tamagawa Holdings potential power plants

Region	Power plants	Avg. feed-in-tariff (JPY)	Capacity (MW)	Capex (JPYmn)	Tamagawa's investment (JPYmn)	PV of future cashflows (JPYmn)	NPV of future cashflows (JPYmn)
Kyushu	5	34	1.8	583	116	436	320
East Japan	3	38.0	21.7	8,325	1,655	6,850	5,185
Central Japan	6	33.6	14.1	4,878	975	4,920	3,945
North Japan	1	36.0	24.0	8,975	1,791	6,620	4,829
Total	15	36.1	61.6	22,743	4,548	18,829	14,280

Source: Company data

### Improving fundraising

Shared Research thinks that the recent trend of looser lending restrictions by financial institutions will allow the company to readily expand its solar power generation business.

According to the company, lending from financial institutions has shown improvement since FY03/14, due to a recovery in earnings at subsidiary Tamagawa Electronics and solid results from the Shimonoseki Solar Power Plant. Borrowing activity included a loan of JPY200mn from Chiba Bank for long-term operating expenses and a JPY200mn loan from Resona Bank (subsidiary of Resona Holdings, Inc.; TSE1: 8308) for short-term operating expenses. Development is also progressing for a 2MW solar power plant currently scheduled to begin operation in February 2015 in Tateyama City, Chiba. For solar power generation systems to be used at this facility, the company entered into a lease agreement with Ricoh Leasing Co., Ltd. (TSE1: 8566) in the amount of JPY901mn.

In December 2014, Tamagawa announced plans to issue share options in January 2015 for allocation to Macquarie Bank Limited. The company expects to raise JPY2.2bn, which it will invest in projects such as the Misawa power plant.



## Geothermal power generation business

### Geothermal power generation

Geothermal power generation involves using steam and hot water produced under the earth's surface to drive steam turbines connected to electricity generators. This type of generation produces less carbon dioxide than thermal power stations. Another advantage is that geothermal generation is not affected by the depletion or rising prices of fuel, and it can be used in perpetuity. Geothermal generation also provides stable power; it is not affected by the weather, seasons, or day/night fluctuations like other major renewable energy sources such as solar and wind power.

The two main methods of geothermal power generation are steam and binary generation.

- Steam generation: With this method, turbines are driven directly by natural steam at temperatures of 200–300C or more. Subterranean water at high temperatures and pressures is dominated by either steam or hot water. With the former, moisture can be easily removed and the dry steam routed to turbines to generate electricity. If the source is dominated by hot water, the fluid is first run through a flasher, which separates the steam from the hot water. In a double-flash cycle, turbines are driven by both high- and low-pressure steam.
- Binary generation: This method is used when hot water and steam temperatures are 150C or less, and thus cannot drive turbines directly. Heat is exchanged from the geothermal fluid to a medium that has a lower boiling point than water (such as a water/ammonia mixture), and steam from that medium drives turbines to generate electricity.

### Feed-in tariff system for geothermal power generation

Under the FY 2014 feed-in tariff system, the price for electricity produced by solar power plants is JPY32 per kilowatt and the purchase period is 20 years (consumption tax not included for 10kW or more). In contrast, the price for electricity produced by geothermal power plants is JPY40 per kilowatt and the purchase period is 15 years (consumption tax not included for 15,000kW or less).

### Beppu geothermal power plant

Tamagawa made the decision in December 2014 to begin a geothermal power generation business. The company is building a binary generation plant in the city of Beppu, Oita Prefecture that uses a nearby spring as its hot water source. The Beppu geothermal power plant, slated to generate 125kW of power and involve capex of JPY200mn, is scheduled to commence operations in August 2015. According to Tamagawa, the new plant should have generation capacity equivalent to a 1MW solar power plant and produce an internal rate of return (IRR) of around 16%. This figure is high compared with its average IRR of around 13% for solar plants currently in operation and those that have been sited.

This development is the first instance of a listed Japanese company entering the geothermal power generation business since the feed-in tariff system went into effect in July 2012 with the promulgation of the Act on Special Measures Concerning Procurement of Renewable Energy by Operators of Electric Utilities. Tamagawa plans to leverage its first-mover advantage and apply the expertise it gains to develop the business further.

The company will spend JPY92mn to start this business. This outlay will go to build generation facilities for the Beppu geothermal power plant, install pipes, acquire rights to the power source and purchase land. In December 2014, Tamagawa announced plans to allocate warrants to Macquarie Bank Limited in January 2015. Part of the JPY2.2bn it raises with this issue will go toward investment in the geothermal power generation business.





## Business

### Business description

Tamagawa has two business segments: 1) Electronics and Telecoms Equipment business, which it has been involved in since the founding of consolidated subsidiary Tamagawa Electric Co Ltd in 1968; and 2) Solar Business, launched in FY03/12. In Q1 FY03/14 Tamagawa divided the Solar Business into Solar Power Plant operations and Solar Systems Sales.

Earnings by segment (JPYmn)		FY03/09	FY03/10	FY03/11	FY03/12	FY03/13	FY03/14	
		Act.	Act.	Act.	Act.	Act.	Act.	
Sales	Electronics and telecoms equipment	3,248	2,709	2,390	2,406	3,156	3,230	
	YoY	-14.2%	-16.6%	-11.8%	0.7%	31.2%	2.3%	
	Components	75.6%	96.6%	90.5%	77.5%	85.9%	77.4%	
	Solar system sales	-	-	-	19	441	890	
	YoY	-	-	-	-	2215.0%	101.8%	
	Components	-	-	-	0.6%	12.0%	21.3%	
	Solar power plant operations	-	-	-	-	-	52	
	YoY	-	-	-	-	-	-	
	Components	-	-	-	-	-	10.7%	
	<b>Total</b>		<b>4,299</b>	<b>2,803</b>	<b>2,640</b>	<b>3,106</b>	<b>3,672</b>	<b>4,171</b>
	YoY	7.1%	-34.8%	-5.8%	17.7%	18.2%	13.6%	
	OP	Electronics and telecoms equipment	-162	-292	-236	63	375	480
		YoY	-	-	-	-	497.4%	28.1%
		Components	-	-	-	-	100.4%	100.7%
		Solar system sales	-	-	-	-24	54	51
YoY		-	-	-	-	-	-5.5%	
Components		-	-	-	-	14.5%	10.7%	
Solar power plant operations		-	-	-	-	-12	-20	
YoY		-	-	-	-	-	58.3%	
Components		-	-	-	-	-3.3%	-4.1%	
<b>Total</b>			<b>-212</b>	<b>-290</b>	<b>-283</b>	<b>-9</b>	<b>387</b>	<b>512</b>
Others			144	63	-6	-16	-11	-
Adjustments			-	-	3	-4	-2	-35
<b>Consolidated</b>			<b>-68</b>	<b>-227</b>	<b>-286</b>	<b>-30</b>	<b>373</b>	<b>477</b>
YoY		-	-	-	-	-	27.8%	

Source: Company data

Figures may differ from company materials due to differences in rounding methods.

In FY03/14, the company changed segments to include solar system sales and solar power plant operations.





## Business segments

### Electronics and Telecoms Equipment

77.4% of FY03/14 sales; 100.7% of FY03/13 operating profit

As some business segments have operating losses this segment accounts for over 100% of OP.

Since the founding of consolidated subsidiary Tamagawa Electric in 1968, Tamagawa has used its high-frequency wireless technology to develop, manufacture and sell high-frequency devices (amplifiers, attenuators, filters, distributors and frequency synthesizers). These products are used in wireless equipment used in mobile telecoms base stations as well as in broadcasting and disaster prevention and firefighting systems. High-frequency devices (circuits and measuring instruments) support an antenna's radio wave transmissions by screening radio waves and adjusting signal intensity. They are physically connected to cables.



Source: Company materials

According to Tamagawa high-frequency wireless is useful for data and video transmission as it uses wide-band radio waves, enabling fast transmission. In recent years the share of digital technology in telecoms and broadcasting equipment has been rising. However digital is not suitable for some front-end parts used for directly transmitting high-frequency signals. There is still a place for high-frequency analog technology and Tamagawa specializes in analogue high-frequency technology. While many vendors, including Tamagawa, are able to provide digital technology, few companies specialize in making high-frequency analog technology products. Hence, Tamagawa occupies a niche with high market share. Its market share in mobile telecoms base station parts stands at around 15%.

**Mobile telecoms base stations:** Mobile telecoms networks are built around wireless base stations, which have large antennas connected to wireless telecoms equipment joined to each other by fiber-optic and other cables. As mobile phone signals will only transmit over a limited range, operators create a honeycomb shaped network by installing a large number of base stations throughout a service area. In 2013 Japan had 550,000 base stations per MCA Inc.

During FY03/14, approximately 44% of Electronics and Telecoms Equipment sales come from devices for mobile telecoms base stations, about 28% from defense system-related sales, and 28% from devices for areas as government services, disaster management and terrestrial digital broadcasting. Tamagawa's main devices for mobile telecom base stations are high-frequency filters, distributors, synthesizers and



attenuators, which identify radio waves of certain frequencies from among the diverse range of radio waves both transmitted and received by the antenna and amplify those specific radio waves.

**Electronics and telecoms equipment sales by industry**

(JPYmn)	FY03/13	FY03/14
Total	3,155	3,233
Mobile telecoms	1,924	1,422
YoY	-	-26.1%
% of total	-	44.0%
Defense	504	905
YoY	-	79.6%
% of total	-	28.0%
Others (government etc.)	727	906
YoY	-	24.6%
% of total	-	28.0%

Source: Company data

About 60% of sales are custom orders for large electrical/electronics manufacturers, telecoms carriers and broadcasters; 40% are own-branded products sporting wider gross profit margins. The segment's gross profit margins are higher for products produced in-house.

In the 1990s base station components sales saw strong growth as domestic carriers aggressively built networks. Until 2005 Tamagawa tracked circa 30% market share. Thereafter foreign rivals with keen pricing gained market share prompting Tamagawa's growth to stall. The segment's profitability recovered once the company stopped accepting money-losing orders in FY03/12. The plan is to develop higher value-added products to boost profitability.

**Ace tie-up**

In May 2013 Tamagawa unveiled an alliance with Ace Technologies Corp (Ace) of Korea, to market high-frequency devices, antennas and peripheral equipment in Japan. Ace is a big manufacturer of high-frequency devices and antennas, which are used a lot in Korea and Europe. Ace has several subsidiaries in Guangdong, China, and can supply cost-competitive products quickly. Tamagawa's quality control experience and sales network in Japan, in tandem with Ace's manufacturing knowledge, spells cost competitiveness and potential market share gains. By using Ace's manufacturing facilities, Tamagawa says it is aiming to reduce production costs by 30%. From Q4 FY03/14, production outsourced from Ace for mobile telecom base station filter components began, and the company said it is experiencing sales growth on better pricing and wider margins.

**Solar System Sales**

21.3% of FY03/14 sales; 10.7% of FY03/14 operating profit

In July 2011 Tamagawa entered an exclusive agreement to sell the solar modules of GPPV Solar Pte Ltd (GPPV below), and began selling GPPV solar systems (The exclusive selling agreement was changed to a selling agreement in February 2014, in order to further the growth of both companies' businesses).

Tamagawa's solar power facilities:



Source: Company materials

In 2011 the company used the quality control methods it developed in its Tamagawa Electric Electronics and Telecoms Equipment segment to improve, via installing EL testers for module inspection, GPPV's production lines. The sharing of images between Tamagawa and GPPV and inspecting all the products enhanced product quality.

**EL Tester:** a method of using electroluminescence (EL) on solar battery cell modules, recording data and measuring with a camera to inspect for defects.

Tamagawa said that if a minute crack forms in a solar module cell during production, some years later the crack will widen, denting efficiency. Better quality control at GPPV should reduce fade.

Through sales agencies the company provides customers with photovoltaic (PV) modules and power conditioners. Where necessary the company also negotiates with electric utilities on behalf of customers and assists with loan applications to financial institutions.

Regarding sales activities, the company has offices in Kyushu, Nagoya, and Tokyo, and has eight sales employees as of December 2014.

Customers are primarily corporate clients that are existing customers or introduced from partner firms. Most customers are debutants jumping on the bandwagon of the solar power build-up, supported by the Japanese government, which has a 20 year fixed rate guarantee for feed-in tariffs of solar power facilities that generate 10kW or more. Other individuals and companies view solar power generation as a tax conservation method, due to the generous deductions and instant depreciation available for such developments. In December 2012, the company formed a partnership with Goto city in Nagasaki



Prefecture, based on which it is installed a solar park. This has led to an increase in inquiries from local governments in surrounding areas.

In Japan contracts under the Feed-in Tariff (FIT, for details see later in report) scheme of the Ministry of Economy, Trade and Industry (METI) oblige electric utilities to buy electricity generated using 10-kilowatt or more solar power plants at a fixed price for 20 years. Prices and durations are revised every year. In 2014 (April 2013 - March 2014) the price of solar electricity was JPY36 (excluding tax) per kW for 20 years. Prices for 2015 (April 2014 - March 2015) have been lowered to JPY32 (excluding tax) per kW. Generation facilities must obtain FIT certifications from METI. If a solar power producer applies for Green Investment Tax Incentives, related facilities can be fully depreciated immediately. The government also has similar regulations in place for wind, hydroelectric, geothermal, and biomass generation.

The company sells solar systems for about JPY300,000 per kW of installed capacity. Sales are determined by multiplying installed generating capacity (kW) by the price per kW of installed capacity. Solar system gross profit margin is 15-25%.

In the solar system sales business, one risk is that the price paid under the FIT scheme will be cut, leading to lower demand. Initial investments at solar parks enjoy economies of scale—a capacity increase does not require a proportionate increase in upfront investment. Tamagawa thinks that even if the FIT price were to be lowered to JPY30.0 per kWh, the customer would still obtain an investment yield of at least 10.0%.

Specifically, at a price of JPY36.0/kWh (excluding tax; for projects that were approved between April 2013 and March 2014), annual electricity sales revenue from a 1MW plant is estimated at JPY40mn. As of December 2013, the initial investment for a 1MW solar park is approximately JPY300mn, and based on this figure, the investment yield is estimated at 13.3%. In contrast, the initial investment required for a solar park with a 1.2MW capacity is around JPY330mn, and even if the FIT were reduced to JPY30.0/kWh, the annual revenue would be JPY38mn, giving an investment yield of 11.5%.

## Solar Power Plant Operation

10.7% of FY03/14 sales; operating loss of JPY20mn in FY03/14

The solar power plant operation business comprises solar power system sales and from FY03/14 the operation of mega solar (power generation solar parks).

### What is mega solar?

Mega solar refers to solar power stations of 1MW-plus. Since the start of the FIT scheme for renewable energy in July 2012 it has been easier to secure profits, and a number of players from different sectors have joined the fray. There is also a trend for local governments and private-sector businesses to join forces and build mega solar businesses on vacant land. While output varies with the location and amount of sunlight, a 1MW mega solar plant typically generates a minimum of 1,000 MWh per year. A normal four-person household uses 5.5 MWh per year; a 1MW mega solar plant can normally supply 300 households. Mega solar plants need land: a 1MW plant covers about 15,000 m<sup>2</sup> (Tokyo Dome: 47,000 m<sup>2</sup>).

To take advantage of the FIT scheme first the operator needs METI approval to certify that the generation facilities comply with the law. The purchase price for power generated in the scheme depends on when the facilities were certified rather than when operations started. Other than gaining licenses for the generating facilities and equipment, operators face no special requirements to qualify to sell all the



renewable power they generate under FIT. While it is necessary to appoint a chief electrical engineer company operators do not need to have electricity business experience.

#### **Tamagawa's solar power plant operating business**

When Tamagawa was considering entering the mega solar business, in June 2012 it set up a planning office and in September that year set up subsidiary GP Energy. Its first project—Shimonoseki power plant in Shimonoseki, Yamaguchi prefecture—began operations in June 2013.

Tamagawa operates mega solar power plants in this subsegment, forming special-purpose companies (SPC). The SPC buys or leases land on which it builds and runs solar power plants of 1MW-plus capacity. The SPC scheme enables separate project financing, i.e., finance based on expected revenues for a particular project. As of December 2014, Tamagawa HD had 10 subsidiaries responsible for running solar power plants, GP Energy 1 Co., Ltd. through GP Energy 6 Co., Ltd. and GP Energy A, LLC through GP Energy D, LLC.

The company said upfront investment in mega solar plants—covering PV modules, supporting structures, electrical facilities and labor—runs to JPY260–320mn per MW.

Electricity is sold to electric utilities. Revenue is selling price per kW multiplied by total amount of electricity sold. FIT defines electric utilities' purchase prices as JPY40.0 (excluding tax) per kW for electricity generated at facilities that were FIT-certified in 2012, JPY36.0 (excluding tax) for those certified in 2013, and JPY32.0 (excluding tax) for those certified in 2014. Purchase duration is fixed at 20 years.

If a solar plant generating 1.0GW to 1.4GW of electricity per year was FIT-certified in 2012, electric utilities will buy electricity for JPY40 (excluding tax) per kW—implying revenues of JPY40mn. Weather and other factors impact the amount of power generated. Panel aging cuts output by 0.25-0.75% per year. The main costs are depreciation, land rent, maintenance fees and insurance. Gross profit margins hover around 50% and the unlevered internal rate of return could be 9%.

#### **Tamagawa's solar power plants**

As of November 2014, the company's solar power facilities, including those already in operation and planned facilities with secured land had a combined potential generating capacity of 11.4MW. Shared Research estimates that revenue from the operating and planned plants will be around JPY515mn.

As of February 2015, the Shimonoseki and Tateyama (Chiba Prefecture) plants were in operation. The company also plans to bring a 1.3MW solar park in Sodegaura (Chiba Prefecture) online in late March 2015.

The company is also building a 1MW solar park in Minami Shimabara, Nagasaki Prefecture, and preparing to begin construction of a 5.5MW solar park in Goto City, Nagasaki Prefecture, which it expects to begin operations in Q4 FY03/16.

In addition, in December 2014 three Tamagawa subsidiaries acquired a power operator license in the city of Misawa, Aomori Prefecture, from ISE Power. At the same time, Tamagawa announced plans to build and operate the 10MW Misawa solar power plant. The company expects to begin selling electricity from the plant by FY03/16, contributing around JPY390mn to annual sales.





**Shimonoseki Solar Power Plant**



Source: Company materials

**Tamagawa Holdings solar power plants**

Solar parks	Location	Feed-in-tariff	Output (MW)	Area (sqm)	Completion date	Investment (JPYmn)	Sales (JPYmn)
Shimonoseki	Shimonoseki, Yamaguchi	40.0	1.6	24,081	Q1 FY03/13	440	77
Tateyama	Tateyama, Chiba	40.0	2.0	35,386	Q4 FY03/15	637	96
Sodegaura	Sodegaura, Chiba	36.0	1.3	15,000	Q4 FY03/15	488	56
Minamishimabara, Nagasaki	Minamishimabara, Nagasaki	40.0	1.0	12,000	Q4 FY03/16	299	48
Goto Islands	Goto, Nagasaki	36.0	5.5	100,000	Q4 FY03/16	-	238
Total	-	-	11.4	-	-	-	515

Source: Company data

Shared Research estimate for sales, based on annual electricity sales of 1,200MW per 1MW solar power facility.

**Misawa power plant details**

Solar park	Location	Feed-in-tariff	Output (MW)	Area (sqm)	Completion date	Investment (JPYbn)	Sales (JPYmn)
Misawa power plant	Misawa, Aoyama Prefecture	36.0	10.0	153,000	FY03/16	3.4	390

Source: Company data

**Fundraising in solar power generation business**

In November 2014 Tamagawa said that the number of potential projects was increasing. These plans are stymied by personnel constraints. For the five years from FY03/08 Tamagawa posted back-to-back net losses, making debt funding difficult. To launch the mega solar business in January 2013 it raised



JPY901mn (assuming all options exercised) via share placement and share option issuance. The company is trying different operating models.

According to Tamagawa Holdings, it has an increasing number of financing options, owing to its two consecutive years of profitability as of FY03/14, and earnings results at the Shimonoseki solar power plant.

Accordingly, in January 2014 the company took out a loan of JPY200mn from Chiba Bank for long-term operating expenses. In March 2014, it took out another loan of JPY200mn for short-term operating expenses from Resona Bank, followed by a June 2014 loan of JPY100mn from Higashi-Nippon Bank for long-term operating expenses. Development is progressing on a 2MW solar power plant scheduled to begin operation in February 2015 in the city of Tateyama, Chiba Prefecture. For solar power generation systems to be used at this facility, the company has entered into a lease agreement with Ricoh Leasing in the amount of JPY901mn. In December 2014, Tamagawa also announced plans to raise JPY2.2bn by allocating share options to Macquarie Bank Limited in January 2015. These funds are earmarked for investments including the Misawa and Minamishimabara power plants indicated above.

Tamagawa is considering project finance and investment from sleeping partners. In June 2013 the company was certified as a qualified institutional investor.

#### Sales to power producers and suppliers

Tamagawa said it can sell its electricity to a new breed of electricity retailers called Power Producers and Suppliers (PPSs) at higher rates than it receives under FIT. Thus it wants to sell to PPSs.

**Power Producer and Supplier (PPS):** New entrants to the electricity market selling low price electricity derived from other companies' factories or generated in-house. They emerged following partial deregulation in 2000 when the sale of large lots of electricity in the retail market was liberalized.

Electric utilities buy renewable electricity as follows.

- The electric utility buys renewable electricity from the generating company at a fixed price set via FIT.
- The utility sells the electricity it has bought to the end user thereby receiving revenue, including a renewable energy levy based on the cost of buying the renewable electricity.
- The utility pays the renewable energy levy to an electric utilities' expense coordinating body.
- The expense coordinating body distributes the renewable energy levy monies to the utilities in proportion to the amount of electricity they have bought.
- The money that the expense coordinating body distributes to the utilities is the difference between what they paid to buy renewable electricity and their avoidable costs. For the electric utilities avoidable cost is the actual expense of selling renewable electricity.

**Avoidable costs:** The costs that the electric utility did not incur because it did not generate a certain amount of electricity which it instead bought under the FIT scheme.

Avoidable cost depends on how each electric utility calculates electricity charges. In financial 2013 the highest was Tokyo Electric Power (TEPCO) at JPY9.98 per kWh and the lowest was Hokuriku Electric Power at JPY4.37. Avoidable costs for the PPSs are a weighted average of the electric utilities where they operate. The highest is equal to TEPCO's JPY9.98. On the Japan Electric Power Exchange (JEPX, a wholesale power market) the spot price of electricity was around JPY15 per kWh in May 2014. PPSs arbitrage the difference between the spot price and avoidable costs. They make money by buying renewable electricity from the generators under FIT and selling it on the JPEX.



## Strengths and weaknesses

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### Strengths

- **Benefiting from stable demand the electronics business has regained competitiveness:** The company said it has regained its competitive edge in high-frequency devices. Selling higher value-added products via original equipment manufacturer (OEM) channels and beefing up telecoms and public (defense and disaster prevention) demand has borne fruit. In public demand a preference for Japanese suppliers lends Tamagawa an advantage over overseas rivals. Restarting R&D and selling under its own brand should enhance earnings.
- **Correct size and skills for solar success:** Although Tamagawa is building its solar power generation business from scratch it already has experience in solar installations and project financing. It is listed and sports a profitable core business but given its modest size tackling small projects makes sense. Tamagawa appears to have the qualities to attract partners. A big plus: the government guarantees selling prices. If funding crystalizes watch for the solar parks to fuel earnings growth.
- **Entrepreneurial management wants to rekindle investor trust:** Shared Research flags a resolve to get it right this time. It has entrepreneurial energy although is aware of investor scepticism. Liaising with investors and partners, Tamagawa wants to rebuild its image. According to the company, investors appreciate its full disclosure.

### Weaknesses

- **Reputation:** Tamagawa has a history of business failures. CEO Toru Masuzawa is the subject of controversy. Masuzawa has been a defendant in a number of civil lawsuits relating to his time at J Bridge, but asserts that he was a victim of circumstance, and will rebuild his reputation and prove his management acumen. In addition to developing procedures to deal with reputational risk, in February 2014, the company established a compliance committee, and contracts with an outside legal firm for advisory services.
- **Shortage of manpower in Solar:** The Solar Business had a staff of 67 as of December 2013. The complexity of projects requires personnel with high entrepreneurship, strong motivation and expansive knowledge from fundraising to electrical engineering. However, efforts to hire appropriate personnel quickly may block sound corporate growth. Considering the downtrend in the feed-in-tariffs of renewable energy and limited business opportunities, this lack of human resources is concerning.
- **Potential rate cuts for fixed-rate feed-in tariffs:** It is Shared Research's understanding that as of May 2014, demand for solar power generation construction is a direct result of the fixed-rate feed-in tariff system implemented from July 2012. However, the rate has been lowered each consecutive year, and it is likely that demand for solar power generation construction will decline in the medium term. According to the company, it will combat this issue by improving power conversion efficiency of its solar cells and other components in an effort to continue providing benefits to consumers.





## Group companies

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At end FY03/13 the group comprised Tamagawa Holdings Co Ltd and five consolidated subsidiaries.

- Tamagawa Electronics Co Ltd (100%): electronic and telecoms equipment business.
- Tamagawa Solar Systems (100%): solar system sales business.
- GP Energy Co Ltd (100%): solar power plant business.
- GP Energy 2 Co Ltd (100%): solar power plant business.
- GP Energy 3 Co Ltd (100%): solar power plant business.
- GP Energy 3-A Co Ltd (100%): solar power plant business.
- GP Energy 5 Co Ltd (100%): solar power plant business.
- GP Energy 6 Co Ltd (100%): geothermal power plant business.
- GP Energy A LLC (100%): solar power plant business.
- GP Energy B LLC (100%): solar power plant business.
- GP Energy C LLC (100%): solar power plant business.
- GP Energy D LLC (100%): solar power plant business.



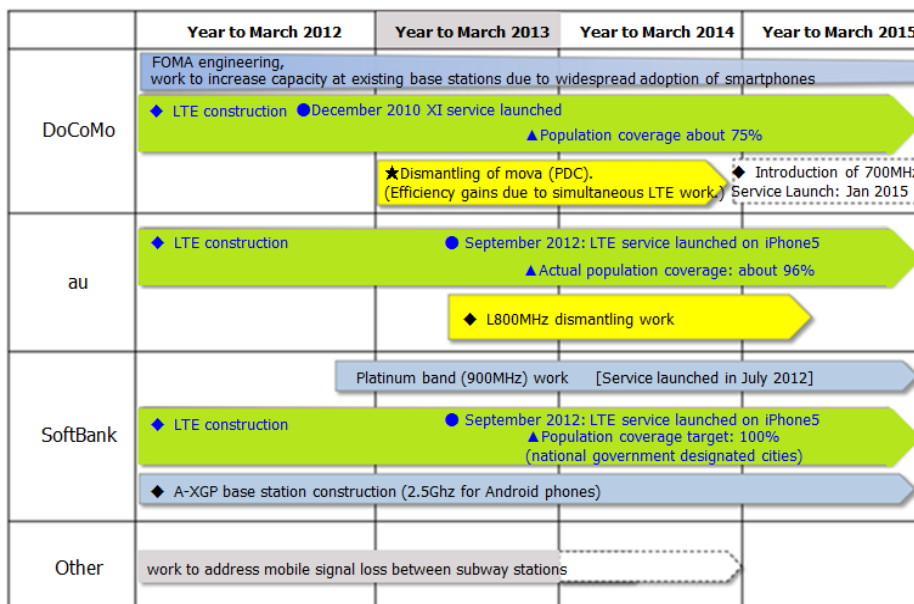
## Market and value chain

### Market overview

#### Wireless telecoms infrastructure

**Smartphones and tablets are revolutionizing the wireless telecoms market.** Smartphones generate 10-20x as much data traffic as traditional mobile phones. As bandwidth-hungry content mushrooms, data volumes swell. Dealing with the traffic surge is a pressing issue, creating demand for network infrastructure that can handle serious data volumes and speeds. As of 2014, telecoms operators have aggressively rolled out high-speed mobile services like LTE and WiMAX. Spectrum reallocation is helping too. There is also a nationwide trend toward data offloading—using wi-fi and the like to funnel data through the fixed-line network.

**Mobile data traffic is forecast to grow by 20.8x from 2010 to March 31 2016** (1.84x per year on average); traffic could swell by as much as 39.1x (2.08x per year). Source: Wireless LAN Business Study Group Report, published in July 2012 by the Ministry of Internal Affairs and Communications. Who knows whether network infrastructure will keep up? In LTE NTT DoCoMo (TSE1: 9437) had 24,400 base stations by end FY03/14, and 55,300 at end FY03/14. By end FY03/15, it plans to increase this figure to 95,300. KDDI Corp (TSE1: 9433) plans to increase its capital expenditures for mobile telecom equipment from JPY344.3bn in FY03/14 to JPY380.0bn in FY03/15.



Source: Industry materials, SR. Inc. Research

Beyond LTE the mobile phone carriers plan to commercialize LTE Advanced technology from 2015. This may prompt further aggressive capex to keep smartphone addicts happy.

#### LTE Advanced

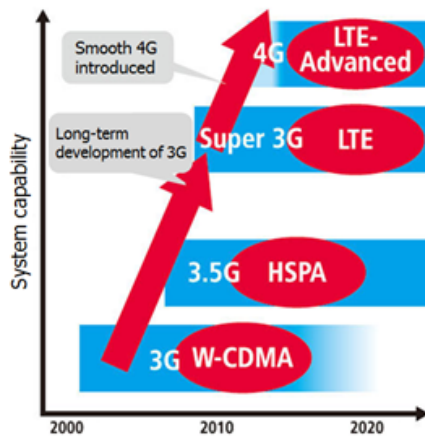
LTE Advanced is a fourth generation mobile telecoms standard recognized by the International Telecommunication Union (ITU)\*, offering higher speeds than LTE which has spread globally. Under development, it aims at providing speeds of up to 1Gbps when the user is stationary and up to 100Mbps



when moving on a train.

\* In mobile and electronic telecoms the ITU aims to establish standards and regulations between countries. Main activities: standardization, allocation of mobile spectrum and coordinating connections between countries to enable international telephone calls.

Evolution of Telecommunications Technology



Source: Various materials, SR Inc. Research

Faster speeds under LTE Advanced will be attained by adding technical elements to existing LTE technology. Two elements are key: upgrading the multiple-input and multiple-output (MIMO) technology used in spatial multiplexing, and carrier aggregation to enable bandwidth expansion.

MIMO technology is used to increase the volume of data that can be handled at any one time by sending different data packets and separating the mixed signals once received. In addition to the currently prescribed 2x2 MIMO and 4x4 MIMO, under LTE Advanced it will be possible to implement 8x8 MIMO using eight pairs of antennas. The upshot: higher maximum transmission speeds. Under current LTE technology where MIMO is not installed on the uplink side (sending data from the mobile device) it is handled by 2x2 MIMO and 4x4 MIMO.

It is Shared Research's understanding that NTT DoCoMo's current LTE network is composed mostly of 3G base stations that have been updated with LTE components. In contrast, new frequency allocations are planned for the introduction of LTE Advanced, and this will require changes to base stations, including the antennas. In the long term, it is reasonable to think that demand for capital investment in mobile telecom equipment will increase, with NTT DoCoMo leading the way for implementation of LTE Advanced.

On December 19, 2014, the Ministry of Internal Affairs and Communications announced the allocation of 3.5GHz bandwidth for the LTE-Advanced 4G mobile communications system to three companies: NTT DoCoMo, KDDI and SoftBank Mobile. KDDI plans to begin service in the 3,520–3,560MHz band in June 2016, NTT DoCoMo plans on 3,480–3,520MHz in October 2016, and SoftBank Mobile on 3,560–3,600MHz in December 2016.



## Solar power market

### Outlook for Japan's solar power market

Fuelled by concerns over global warming and an escalating oil price, clean energy is in the spotlight. Nuclear power from a safety perspective fails to live up to the clean energy label. A promising new energy source is photovoltaic (PV) or solar generation, using solar cells to convert sunlight to electrical energy without releasing CO<sub>2</sub>.

Underpinned by government policies promoting solar power in Japan, the number of solar power installations is multiplying. However, according to the Ministry of Economy, Trade and Industry, the amount of electrical power produced by renewable sources in Japan in FY 2013, including hydroelectric, was 10.7% of total power output, and solar power accounted for just 1.0% (0.2% during FY 2011; 0.4% during FY 2012).

Approved by the Cabinet in April 2014, the new Strategic Energy Plan includes items such as maximizing growth of renewable energy sources for three years after 2013, focusing on growth in the sector beyond 2016, and aiming to go above and beyond the measures outlined in the plan.

The existing Strategic Energy Plan, approved in August 2009, called for 13.5% (141.4bn kWh) of energy to come from renewable sources by 2020. Additionally, the Advisory Committee for Natural Resources and Energy published a recommendation in 2010 that 20% (214.0bn kWh) of energy come from renewable sources by 2030.

According to the JPEA PV Outlook 2030, published by the Japan Photovoltaic Energy Association (JPEA), the amount of solar power generation capacity is estimated to reach 49GW by 2020, and 102GW by 2030. Concerning early installation figures, 2014 is expected to be slightly higher than 2013, gradually tapering off in subsequent years.

### Japan's policies to promote solar power

In the past, to promote the spread of renewable energy, electricity companies voluntarily bought such power; the Renewable Portfolio Standard (RPS) Law and subsidy programs at the local government level were also used. By 2004 Japan was number one in the world for installed solar cells. However after the subsidy program operated by the New Energy Foundation was terminated in 2005 the domestic market shrank.

**Renewable Portfolio Standard (RPS) Law** is the abbreviated name for a law enacted in Japan in June 2002—the Special Measures Law concerning the Use of New Forms of Energy by the Electric Power Industry. The law was designed to promote the use of new energy by mandating minimum usage for electricity derived from new energy sources by electrical utilities.

For this reason, based on an urgent proposal in January 2009, METI reinstated a subsidy program. In February 2009 the Ministry of the Environment also announced estimates for the cost and economic benefits of adopting renewable energy sources. As a promotion measure, the ministry proposed a feed-in tariff (FIT) scheme, which commenced in November 2009 covering surplus power generated by households. The Act on Special Measures Concerning Procurement of Renewable Electric Energy by Operators of Electric Utilities (abbreviated to FIT Act) was enacted in August 2011 and implemented in July 2012, and became fully eligible for the FIT scheme.

### Feed-in Tariff (FIT) scheme

Under the FIT scheme, **to promote the use of renewables**, electric utilities are required to buy all the



power generated by five types of renewable energy sources, including solar and wind. Solar power was popular in Spain and Germany owing to a similar system. A high tariff is designed to stimulate the development of renewables. As of May 2014, surplus power from solar generated from sub 10kW systems is bought under FIT and all power from solar power generated from systems over 10kW is bought under FIT.

For less than 10kW solar power generated systems, the FIT scheme is applied, and surplus solar power generated by households is sold to electric utility companies. When the scheme was launched in 2009, the feed-in tariff for surplus power was JPY48/kWh. The tariff remains fixed for 10 years from installation of the solar power system. The scheme envisages annually lowering the tariff for newly installed generation capacity. As of May 2014 the FIT for new installations was JPY37/kWh (excluding tax).

Separate from the surplus power FIT scheme (net metering), a different scheme covering all power generated by a renewable electricity producer has also been established. This scheme enables producers to sell all power generated regardless of their own consumption. In Japan, a FIT scheme for over 10kW capacity was launched in July 2012. FIT tariff rates for 2012 were JPY40 (excluding tax) per kWh, and power companies are required to purchase power at this rate for 20 years. Prices have since been pushed down, with the rate being JPY36 (excluding tax) per kWh in 2013 to JPY32 (excluding tax) per kWh in 2014.

The tariff and purchase period set under the FIT schemes are set each year by METI before the start of the financial year. The minister is required to take into account the opinions of a neutral, third-party committee (Feed-in Tariff Calculation Committee), which conducts public deliberations. To promote solar power supplementary provisions, the law requires power producer profits to be taken into consideration when determining the feed-in tariff for three years from the start of the scheme. The cost of purchasing power is recouped by utilities as an extra amount on electricity charges. However when the minister sets the feed-in tariff he is required to ensure that the extra charge is not excessive.

In the case of **solar power** the FIT for commercial solar power systems with a capacity of 10kW or more in FY03/13 was JPY40/kWh (excluding tax) but in FY03/14 this was reduced to JPY36.0/kWh (excluding tax) and further in FY03/15 to JPY32.0/kWh. The Feed-in Tariff Calculation Committee proposal accounted for a range of conditions and set a level that would let producers get a 6% IRR. This was in line with the law, providing for higher returns in the scheme's first three years—meaning IRR is set 1-2% above the normal level.

#### Solar power (10kW or more)

		FY03/13	FY03/14	FY03/15
FIT	Price before tax (JPY)	40.0	36.0	32.0
Capital cost	System unit cost (JPY/KW)	325,000	280,000	275,000
	Land modification cost (JPY/KW)	1,500	1,500	4,000
Annual running costs	Land leasing fees (JPY/sqm)	150	150	150
	Maintenance cost	1.6% of construction cost	1.6% of construction cost	
	General expenses	14% of maintenance cost	14% of maintenance cost	JPY8,000/KW
	Labor expenses	JPY3.0mn	JPY3.0mn	
Internal rate of return (IRR) (before tax)		6.0%	6.0%	6.0%

Source: Feed-in Tariff Calculation Committee

System unit costs includes solar panels, power conditioners, installation, and construction expenses

#### Risk of abolishing FIT

**Spain's** solar bubble in 2007 was caused by its feed-in tariffs (FIT) policies. The purchase price of power



was significantly increased to promote solar power. Subsequently Spain's government changed its policy. It cut the purchase price, set a purchase ceiling, established a purchase price limit, shortened the purchase time period and eliminated subsidies, both retroactive and future. This precipitated a big decline in the number of solar power users.

In 2001 the EU adopted a directive to promote renewable energy and Spain issued new measures in both 2004 and 2007 to boost renewable energy. Measures introduced in 2007 focused on the purchase period for FIT, set at 25 years. The purchase price was set to ensure a 17% IRR, and the annual purchased volume of solar power was increased to 2,708 MW in 2008 from 102MW in 2006. As a result solar capacity significantly overshoot the government's target. Transmission companies posted big losses owing to the high cost of electricity, prompting the government in September 2008 to cut the fixed rate for solar power. In 2009 the bubble burst for Spain's solar power market, with new installations collapsing to 17 MW.

**Japan's** FIT scheme is set at a sensible level, with the purchase period set at 20 years and the purchase price set for a 6% IRR. This is much lower than it was in Spain. Even taking into account a possible reduction in the purchase price for the FIT scheme, which is required following the third year since implementation in 2015, Japan's demand for solar power is unlikely to mirror Spain's experience.

In **Germany**, the government introduced in 2000 the Renewable Energy Law to develop its solar power market. Electric utility companies are required to buy all the solar power produced at a fixed price for 20 years. Hence solar equipment sales took off and installed capacity was the highest in the world in 2005. A large amount of equipment continued to be installed, reaching 31% (approximately 32GW) of the worldwide total in 2012 (European Photovoltaic Industry Association). New installed volume reached 7GW per year in 2010-12. However electricity prices increased sharply as a result and in June 2012 the German government cut the purchase price. Germany's Federal Ministry of the Environment said it expects purchased volume to fall by 2.5-3.5 GW in 2013.

#### **Mega solar power plants**

In Japan, following the introduction of FIT for renewable energy in July 2012, a variety of players entered the solar power generation business. According to METI, before the introduction of the FIT scheme in June 2012, solar power generating capacity was around 900,000 kW. By June 2014, this had grown to about 8.5mn kW.

As of November 2014, possible headwinds included delays to grid connection approval from power companies for renewable energy power plants in September 2014, and a stricter facility certification regime.

#### **Delays to grid connection approval for renewable energy power plants**

The number of solar power facilities increased after the introduction of the feed-in-tariff (FIT) scheme in July 2012. Output from new renewable energy facilities and applications for grid connection together exceeded demand for electricity during slack periods, leading some power companies—Hokkaido, North Japan, Shikoku, Kyushu, and Okinawa—to hold back on grid connection approval for renewable energy power plants over a certain size in September 2014.



Renewable energy output by power company

Power company	Certified output (approx.) ('000kW)	Solar, wind power output and amount applied for (approx.) ('000kW)	Off-peak demand Notes ('000kW)
Hokkaido	3,330	(Output: 700) As of March 2013, applications have been received for about 1.9mn KW of solar power, and 560,000KW of wind power.	2,700 All applications for grid connection on hold except solar power facilities under 10KW (announced September 30) (solar power plants over 500KW may connect to the grid provided they control output without compensation).
North Japan	11,500	12,600 (technical investigations incomplete on about 600 applications)	9,700 All applications for grid connection on hold except solar facilities under 50KW (announced September 30).
Shikoku	2,500	2,800 (technical investigations incomplete on about 20 applications)	2,500 All applications for grid connection on hold except solar facilities under 10KW (announced September 30).
Kyushu	17,900	17,600 Applied for: 13,700 Output: 3,900 (technical investigations incomplete on about 500 applications)	8,000 All applications for grid connection on hold except solar facilities under 10KW (announced September 24).
Okinawa	600	320 (only solar) Output: 130 Applied for: 190	500 Amount applied for has surpassed the amount permissible (announced September 30). Individual negotiations planned, including policies such as stopping the production of solar power for a certain length of time and introducing power storage facilities in solar power plants.

Source: Ministry of Economy, Trade and Industry

The certified output does not include output moved from facilities built before the introduction of the FIT scheme in July 2012.

In the run up to the end of the financial year, power companies have accepted some applications before the completion of technical investigations.

Amid fears that this may limit the maximum renewable energy output, the Ministry of Economy, Trade and Industry (METI) decided to investigate power companies' measures to accept renewable energy applications. On September 30, 2014, METI established a working group for the grid connection of renewable energy, under the New and Renewable Energy Subcommittee (the Committee on Energy Efficiency and Renewable Energy of the Advisory Committee for Natural Resources and Energy). This working group is comprised of experts who will verify grid capacity, and discuss measures for increasing capacity, from a neutral stance.

The working group plans to release its conclusions by the end of 2014.

As of October 2014, suggestions for increasing capacity include limiting hourly output, limiting output for longer or more types of power plants, developing power storage facilities and operational systems, and increasing connections between regions. Shared Research understands that limiting output for longer or for more types of power plants may put downward pressure on solar park revenues.

Per the Act on Special Measures Concerning the Procurement of Renewable Electric Energy by Operators of Electric Utilities, when demand for electricity is low, electricity providers must limit their own output of thermal power and prioritize renewable energy. But electricity providers can still request that suppliers of renewable energy limit their output. However, if electricity providers make such requests on more than 30 days per year, suppliers of renewable energy can claim compensation equal to the income they would have received from the sale of electricity, had output not been limited.

In April 2013, Hokkaido Electric Power Co., Inc. (HEPCO) announced measures in response to grid capacity for large solar power plants of 500kW or more. When the total output of these large facilities is over 700,000kW, HEPCO will not pay monetary compensation, even when it asks suppliers to limit their output on more than 30 days. In this way, HEPCO is increasing its capacity for grid connections.

According to the METI working group, it may be possible to increase total grid capacity by changing the 30 day limit for requests from electricity providers to renewable energy suppliers to limit output, or by making smaller solar power plants (under 500kW) and wind power plants subject to limits on output.





If limits on output are extended for longer or for more types of power plants, Shared Research sees a possibility that revenues from solar parks may fall below expectations.

#### **Stricter facility certification?**

Purchase prices under the FIT scheme are set to enable the supplier to earn a reasonable rate of return. Prices are likely to fall given that solar generation costs are falling.

As a result Shared Research thinks that some solar park operators are rushing to get certification and lock in high electricity purchase prices. Construction may not start straightaway if in turn they are waiting for construction costs to fall. METI said some operators locked in procurement prices from the first year of the scheme (JPY40/kWh pretax) and then delayed the start of construction.

A June 2014 report from METI on the state of renewable energy power plants said that between the introduction of FIT in July 2012 and the end of June 2014 non-residential solar facilities with 66.0mn kW of generating capacity gained certification. As of June 2014, about 8.5mn kW of capacity was online, equal to 13% of certified capacity.

In March 2014, in line with the Administrative Procedure Act and in light of the findings of requests for information from facilities with more than 400kW of output prior to operation, METI began questioning operators of non-residential solar power plants (output of 10kW or more) certified in FY 2013 (April 2012-March 2013) without confirmed details regarding location or facilities. In cases where it could not confirm the necessary information, METI stripped the facilities of their approval. As of August 2014, the total output for non-residential solar power plants certified in FY 2013 was 18.7mn kW—METI removed certification for 1.8mn kW of output, and plans to further question the operators of 2.7mn kW worth of output. In total, 8.8mn kW is produced by plants that have already begun operating, or fulfilled METI's requirements for certification.

Regarding the 2.7mn kW operators subject to further questioning, METI will begin stripping these plants of their certification after confirming details of location and facility if they do not satisfy requirements. METI also plans to request information from operators of plants certified in FY 2014.

Shared Research understands that the operators of solar power plants may lose their certification if they do not make efforts to bring their plants online.





## Strategy

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**Strengthening existing businesses.** In Electronic and Telecoms Equipment, Tamagawa aims to increase sales and profitability by fortifying existing businesses. In Solar, it hopes to grow via a bumper investment program. The company may also develop renewable energy businesses besides solar power (such as biomass, wind, and geothermal power generation). In November 2014 the company said the number of potential projects was increasing. Constraints: insufficient funding and lack of skilled workers.

**Raise capital, build its own solar park.** Solar power plant operations provide stable cash flows but need big upfront investment. Selling solar systems, the second part of Tamagawa's business in the segment, does not require any upfront capital, but does not provide long-term revenues.

Marking a move into renewables other than solar power generation, in December 2014 Tamagawa launched a new business in geothermal power generation business. The company has announced plans to begin selling electricity generated by geothermal power in August 2015.

Tamagawa recognizes its need to push forward with the solar and geothermal power plant businesses to generate funds for capex—through loans from financial institutions and operating cash flows—as well as to cover personnel costs. To boost investment efficiency, the company intends to restructure its portfolio with measures that include the sale of power plants.



## Past performance

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### FY03/14 results (announced May 13, 2014)

Results by segment:

#### Electronics and Telecoms Equipment

This segment saw mobile telecoms companies increase their capex spending on base stations and public expenditure increase for defense facilities and public wireless facilities. Orders received totaled JPY3.5bn (+7.3% YoY) and sales were JPY3.2bn (+2.5%). Specifically, sales in mobile telecoms were JPY1.4bn (-26.5%) due to a large-scale order that was completed in FY03/13 causing a relative decrease. Sales related to defense systems were JPY905mn (+79.6%).

According to the company, it is becoming increasingly adept at developing products in-house. As a result, sales of internally developed products were JPY1.3bn (+36.6% YoY).

Operating profit for the segment was JPY480mn (+28.1% YoY). In addition to the effects of increased revenue, the sales composition of internally developed products—which have relatively higher margins compared to other products in the segment—went up from 30% in FY03/13 to 35% in FY03/14.

#### Solar system sales

Orders for solar power systems have been increasing since the Act on Special Measures Concerning Procurement of Renewable Electric Energy by Operators of Electric Utilities (FIT Act—for feed-in tariffs) came into effect (August 2011). The company also worked to make its sales operations more efficient. Thus, orders received were JPY845mn (+27.3% YoY), sales were JPY890mn (+83.0%), and operating profit was JPY54mn (-5.5%).

#### Solar power plant operations

Sales of electricity began, following the completion of construction of the solar park in Shimonoseki, Yamaguchi Prefecture. The company booked sales revenue from the project from July 2013. However, other solar power projects required startup investment. In the end, sales were JPY52mn (there were no sales recorded for this segment the previous year), and the company made an operating loss of JPY20mn (against an operating loss of JPY12mn the previous year).

### FY03/13 results

Sales hit JPY3.7bn (+18.2% YoY). Operating profit was JPY373mn vis-à-vis a JPY29mn loss in FY03/12. Recurring profit was JPY374mn contrasting with a JPY23mn loss in FY03/12. Net income was JPY339mn compared with a JPY37mn loss in FY03/12. Segment results:

#### Electronics and telecommunications equipment

Owing to a recovery in mobile telecoms companies' base station capex and a resumption of public investment in defense and public wireless facilities, sales touched JPY3.2bn (+31.1% YoY) and operating profit nudged JPY374mn (+497.4% YoY).

#### Solar energy business

The introduction of FIT in July 2012 and better marketing boosted solar generating system orders. Sales rose to JPY486mn from JPY19mn in FY03/12. Operating profit came in at JPY41mn vis-à-vis a JPY24mn loss in FY03/12.



**Biomass energy business**

Sales were JPY74mn (-89.0% YoY). Operating loss reached JPY30mn compared with a JPY47mn loss in FY03/12. The company exited this business in the wake of consolidated subsidiary Bioenergy Resources Co Ltd filing for bankruptcy.

**Income statement**

Income Statement (JPYmn)	FY03/09 Cons.	FY03/10 Cons.	FY03/11 Cons.	FY03/12 Cons.	FY03/13 Cons.	FY03/14 Cons.	FY03/15 Cons.
<b>Total Sales</b>	<b>4,299</b>	<b>2,803</b>	<b>2,640</b>	<b>3,106</b>	<b>3,672</b>	<b>4,171</b>	<b>5,095</b>
YoY	7.1%	-34.8%	-5.8%	17.7%	18.2%	13.6%	22.1%
CoGS	3,348	2,412	2,314	2,516	2,623	2,973	3,616
<b>Gross Profit</b>	<b>951</b>	<b>392</b>	<b>326</b>	<b>590</b>	<b>1,049</b>	<b>1,198</b>	<b>1,479</b>
GPM	22.1%	14.0%	12.3%	19.0%	28.6%	28.7%	29.0%
SG&A	1,020	619	612	619	675	721	947
SG&A / Sales	23.7%	22.1%	23.2%	19.9%	18.4%	17.3%	18.6%
<b>Operating Profit</b>	<b>-68</b>	<b>-227</b>	<b>-286</b>	<b>-30</b>	<b>373</b>	<b>477</b>	<b>531</b>
YoY	-	-	-	-	-	27.8%	11.3%
OPM	-1.6%	-8.1%	-10.8%	-1.0%	10.2%	11.4%	10.4%
Non-Operating Income	45	16	18	14	19	9	8
Non-Operating Expenses	105	14	16	8	17	8	25
<b>Recurring Profit</b>	<b>-128</b>	<b>-224</b>	<b>-284</b>	<b>-24</b>	<b>375</b>	<b>478</b>	<b>514</b>
YoY	-	-	-	-	-	27.6%	7.5%
RPM	-3.0%	-8.0%	-10.8%	-0.8%	10.2%	11.5%	10.1%
Extraordinary Gains	52	0	45	-	1	2	5
Extraordinary Losses	341	346	109	7	0	0	0
Tax Charges	-7	-1	3	6	36	44	92
Implied Tax Rate	1.6%	0.1%	-0.8%	-20.9%	9.6%	9.1%	17.7%
<b>Net Income</b>	<b>-408</b>	<b>-570</b>	<b>-351</b>	<b>-37</b>	<b>340</b>	<b>436</b>	<b>427</b>
YoY	-	-	-	-	-	28.5%	-2.2%
Net Margin	-9.5%	-20.3%	-13.3%	-1.2%	9.3%	10.5%	8.4%

Source: Company data

Figures may differ from company materials due to differences in rounding methods.

**FY03/12 results**

Sales were JPY3.1bn (+17.7% YoY). There was an operating loss of JPY29mn from a JPY286mn loss in the previous year. In the Electronics and Telecoms Equipment division there was a recovery in capex for mobile base stations. Sales were up 0.7% YoY. Margins improved due to lowered COGS and operating expenses. In the biomass energy business, sales rose 172.3% YoY but operating losses were largely in line with the previous year due to cost increases. There was a recurring loss of JPY23mn compared with a JPY284mn loss in the previous year. We flag an impairment loss of JPY3mn, a loss on sale of investment securities of JPY3mn and an annual net loss of JPY37mn (JPY351mn loss in the previous year).

**Historical forecast accuracy**

Initial CE vs. Results (JPYmn)	FY03/09 Cons.	FY03/10 Cons.	FY03/11 Cons.	FY03/12 Cons.	FY03/13 Cons.	FY03/14 Cons.	FY03/15 Cons.
Sales (Initial CE)	3,870	3,389	3,110	2,980	3,378	4,504	4,534
Sales (Results)	4,299	2,803	2,640	3,106	3,672	4,171	5,095
<b>Initial CE vs. Results</b>	<b>11.1%</b>	<b>-17.3%</b>	<b>-15.1%</b>	<b>4.2%</b>	<b>8.7%</b>	<b>-7.4%</b>	<b>12.4%</b>
Operating Profit (Initial CE)	129	139	191	22	69	493	506
Operating Profit (Results)	-68	-227	-286	-30	373	477	531
<b>Initial CE vs. Results</b>	<b>-153.0%</b>	<b>-263.3%</b>	<b>-249.9%</b>	<b>-234.9%</b>	<b>441.1%</b>	<b>-3.2%</b>	<b>5.0%</b>
Recurring Profit (Initial CE)	71	133	179	18	65	488	489
Recurring Profit (Results)	-128	-224	-284	-24	375	478	514
<b>Initial CE vs. Results</b>	<b>-279.9%</b>	<b>-268.7%</b>	<b>-258.8%</b>	<b>-233.0%</b>	<b>476.5%</b>	<b>-2.0%</b>	<b>5.1%</b>
Net Profit (Initial CE)	63	133	179	13	60	449	450
Net Profit (Results)	-408	-570	-351	-37	340	436	427
<b>Initial CE vs. Results</b>	<b>-747.9%</b>	<b>-528.8%</b>	<b>-296.3%</b>	<b>-384.6%</b>	<b>466.3%</b>	<b>-2.8%</b>	<b>-5.1%</b>

Source: Company data

Figures may differ from company materials due to differences in rounding methods.

From FY03/09 through FY03/12 the company initially forecast profits every year but delivered a series of losses. However, in the absence of a solid profitability roadmap, results fell short of company forecasts. FY03/13 results, though, came in well above Tamagawa's forecasts. In addition to a profit recovery in the Electronics and Telecoms Equipment business, Solar chipped in.



## Balance sheet

Balance Sheet (JPYmn)	FY03/09 Cons.	FY03/10 Cons.	FY03/11 Cons.	FY03/12 Cons.	FY03/13 Cons.	FY03/14 Cons.	FY03/15 Cons.
<b>ASSETS</b>							
Cash and Equivalents	820	665	493	56	390	1,764	1,524
Accounts Receivable	1,033	915	663	864	1,345	1,112	1,377
Inventories	345	275	328	299	328	347	447
Other Current Assets	47	63	45	74	52	197	258
<b>Total Current Assets</b>	<b>2,245</b>	<b>1,918</b>	<b>1,530</b>	<b>1,293</b>	<b>2,114</b>	<b>3,421</b>	<b>3,606</b>
Buildings	162	132	94	80	87	114	130
Equipment, Plant	88	36	5	1	58	87	126
Acc. Depreciation	1,151	997	959	899	884	908	966
<b>Total Tangible Fixed Assets</b>	<b>451</b>	<b>295</b>	<b>205</b>	<b>133</b>	<b>564</b>	<b>718</b>	<b>2,410</b>
Investments	251	69	23	8	14	19	23
Other	16	20	7	9	13	19	131
<b>Total Other Fixed Assets</b>	<b>267</b>	<b>89</b>	<b>30</b>	<b>18</b>	<b>27</b>	<b>38</b>	<b>154</b>
Software	25	25	-	-	1	19	88
Other	22	14	-	-	-	12	106
<b>Total Intangible Assets</b>	<b>47</b>	<b>39</b>	<b>-</b>	<b>-</b>	<b>1</b>	<b>31</b>	<b>194</b>
<b>Total Fixed Assets</b>	<b>765</b>	<b>423</b>	<b>235</b>	<b>150</b>	<b>593</b>	<b>788</b>	<b>2,759</b>
<b>Total Assets</b>	<b>3,010</b>	<b>2,341</b>	<b>1,766</b>	<b>1,445</b>	<b>2,709</b>	<b>4,210</b>	<b>6,376</b>
<b>LIABILITIES</b>							
Accounts Payable	511	443	430	364	386	474	620
Accrued Amount Payable		39	31	48	108	86	169
Short Term Debt	507	433	203	30	40	323	300
Other Current Liabilities	99	111	220	156	173	247	392
<b>Total Current Liabilities</b>	<b>1,226</b>	<b>1,026</b>	<b>884</b>	<b>598</b>	<b>708</b>	<b>1,130</b>	<b>1,481</b>
Long Term Debt	216	67	-	-	151	294	539
Other Fixed Liabilities	101	86	83	85	100	148	1,194
<b>Total Long Term Liabilities</b>	<b>318</b>	<b>153</b>	<b>83</b>	<b>85</b>	<b>251</b>	<b>442</b>	<b>1,733</b>
<b>Total Interest Bearing Debt</b>	<b>724</b>	<b>500</b>	<b>203</b>	<b>30</b>	<b>192</b>	<b>618</b>	<b>839</b>
<b>Total Liabilities</b>	<b>1,544</b>	<b>1,179</b>	<b>967</b>	<b>683</b>	<b>959</b>	<b>1,572</b>	<b>3,215</b>
<b>SHAREHOLDER EQUITY (NET ASSETS)</b>							
Issued Capital	1,029	1,102	1,102	1,102	1,387	1,625	1,656
Reserves	1,024	1,096	1,096	1,096	1,381	1,620	1,077
Retained Earnings	-619	-983	-1,335	-1,372	-991	-555	445
<b>Total Shareholder Equity (Net Assets)</b>	<b>1,466</b>	<b>1,162</b>	<b>799</b>	<b>761</b>	<b>1,751</b>	<b>2,638</b>	<b>3,161</b>
Working Capital	867	747	562	800	1,287	986	1,204
Interest Bearing Debt	724	500	203	30	192	618	839
Net Debt	-96	-165	-290	-26	-198	-1,146	-685

Source: Company data

Figures may differ from company materials due to differences in rounding methods.

## Assets

During FY03/14, current assets accounted for 81.2% of total assets. Primary factors were cash and equivalents (51.6% of current assets in FY03/14) and accounts receivable (32.5%). Operating cash flows stemming from improved profitability, stock issuances, and financing activity were factors in cash and



equivalents increasing from JPY390mn in FY03/13 to JPY1.8bn in FY03/14.

Tangible fixed assets shrank from JPY451mn in FY03/09 to JPY133mn in FY03/12 owing to a string of impairment losses amid slumping profits. In FY03/13 tangible fixed assets rose to JPY564mn due to the Shimonoseki power plant (under construction) and JPY97mn of capex in the electronics and telecoms equipment business.

### Liabilities

Accounts payable form the bulk of liabilities at 40% of total liabilities in FY03/14. The average payment period for accounts payable increased from 1.3 months in FY03/09 to 2.0 months in FY03/11. As cash, deposits and interest-bearing liabilities were declining, the company had trouble raising funds, and lengthened the time it took to pay creditors. The period shortened after FY03/12 and in FY03/14 was 1.4 months.

Interest-bearing liabilities shrank from JPY844mn in FY03/08 to JPY30mn in FY03/12. Shared Research estimates that borrowing was difficult due to the profit slump, so Tamagawa repaid short- and long-term borrowings, corporate bond redemptions continued, and there was no debt refinancing. In FY03/13 interest-bearing liabilities increased for the first time in five years and amounted to JPY192mn. Financing activity for both short-term and long-term debt during FY03/14 caused this figure to increase to JPY618mn.

In FY03/14 net debt (interest-bearing liabilities minus cash and deposits) was negative, amounting to negative JPY1.1bn..

### Net assets

Due to the extended profit slump and net losses, net assets declined from JPY2.1bn in FY03/08 to JPY761mn in FY03/12. Retained earnings were minus JPY1.3bn in FY03/12. In FY03/13 net income returned to the black, leading to an increase in retained earnings for the first time in five years. Capital and additional paid-in capital increased due to the placement of 2.1mn shares in January 2013 and the issuance of options (potential issuance: 4.8mn additional shares). We note that 1.8m additional shares were issued in FY03/13 on the exercising of options.

During FY03/14, net assets increased by JPY477mn to total JPY2.6bn. This was due to JPY436mn in net income and a JPY477mn increase stemming from the exercise of share subscription rights issued in January 2013.



## Cash flows

Cash Flow Statement (JPYmn)	FY03/09	FY03/10	FY03/11	FY03/12	FY03/13	FY03/14	FY03/15
	Cons.	Cons.	Cons.	Cons.	Cons.	Cons.	Cons.
Operating Cash Flow (1)	259	-1	68	-332	36	764	387
Investment Cash Flow (2)	-17	12	93	77	-454	-265	-865
<b>Free Cash Flow (1+2)</b>	<b>242</b>	<b>11</b>	<b>162</b>	<b>-255</b>	<b>-418</b>	<b>499</b>	<b>-478</b>
<b>Financial Cash Flow</b>	<b>-194</b>	<b>-82</b>	<b>-299</b>	<b>-168</b>	<b>783</b>	<b>875</b>	<b>238</b>
Depreciation & Amortization (A)	217	76	20	14	22	84	106
Capital Expenditures (B)	-82	-22	-7	-12	-446	-254	-866
Working Capital Changes (C)	122	-120	-186	238	488	-301	219
<b>Simple FCF (NI + A + B - C)</b>	<b>-394</b>	<b>-397</b>	<b>-152</b>	<b>-272</b>	<b>-572</b>	<b>568</b>	<b>-552</b>

Source: Company data

Figures may differ from company materials due to differences in rounding methods.

### Operating cash flow

Operating cash flow hinges on net income, depreciation, goodwill amortization and changes in working capital. The reason that operating cash flow topped net losses plus depreciation and goodwill amortization from FY03/09 through FY03/11 was impairment losses, valuation losses on investment securities and a drop in working capital. In FY03/12 operating cash flow fell despite a narrower net loss due to an increase in accounts receivable. In FY03/13 despite net income returning to the black operating cash flow was JPY36mn, as there was an increase in accounts receivable amid better power generation system sales. In FY03/14, operating cash flow was up, due to factors such as the posting of net income, cash inflows from depreciation expenses, and a reduction in accounts receivable.

### Investment cash flow

Through FY03/12 Tamagawa was restrained in its investments with capex below JPY100mn, so cash flows from investing activities were minus JPY17mn in FY03/09 but positive from FY03/10 through FY03/12. Tamagawa became more active on the investment front in FY03/13; tangible and intangible fixed assets rose by JPY455mn. They rose by JPY97mn in the electronics and telecoms equipment business and by JPY352mn in solar energy. The Shimonoseki solar park accounted for most of the increase in solar energy business. In FY03/14, investment cash flow was negative, primarily due to outflows associated with the acquisition of tangible fixed assets.

### Financial cash flow

Interest-bearing debt declined from FY03/09 through FY03/12, so financing cash flows remained negative. In January 2013 Tamagawa made a placement of 2.1mn shares and issued options (if exercised would prompt the issuance of 4.8mn additional shares) to fund solar park construction. There were 1.8m shares issued in FY03/13 on the exercising of options. In FY03/13 Tamagawa saw JPY783mn in financing cash flows: JPY554mn from the issuance of shares; JPY47mn from option issuance; JPY170mn from long-term borrowing; and JPY100mn from corporate bond issuance. During FY03/14, inflows included JPY450mn from the issuance of shares, and inflows from borrowings.



## Other information

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### History

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**Founded in 1968, the company was a leader in analog high-frequency wireless technology.** By the mid-2000s the business was derailed by Korean competitors. After several missteps and ownership changes Tamagawa found itself with the current leadership in 2012.

**J Bridge Corp became a shareholder in 2007.** In 2007 J Bridge Corp (now Asia Alliance Holdings Co Ltd; TSE2: 9318) became a shareholder. J Bridge in turn installed an executive from a company in which it held an equity stake (J Capital Management Co Ltd, 14.7% stake) to Tamagawa's board in 2007. The new board member was then made CEO and proceeded to make a number of failed acquisitions, speculative investments and unwise decisions, leading to further deterioration.

**Raised capital for biomass energy in 2010.** After the J Bridge-appointed CEO stepped down in 2009, the company liquidated some money-losing subsidiaries in a bid to regain profitability. But amid declining sales its core electronics and telecommunications equipment business continued to lose money in FY03/09-FY03/11. In 2010 the company raised JPY144mn in new capital to launch a biomass energy business. It was liquidated in March 2012 after posting operating losses in FY03/11 through Q2 FY03/13.

**Masanori Kobayashi joins core business in June 2011.** In June 2011, Masanori Kobayashi, a veteran of the company, was appointed a director of Tamagawa Electronics Co Ltd, a subsidiary that is the core business. Kobayashi was subsequently appointed CEO of Tamagawa Electronics in April 2012 and he took charge of rebuilding the electronics and telecommunications equipment business. The reform included exiting unprofitable projects, something Tamagawa was routinely doing while battling overseas rivals. The segment returned to operating profitability in FY03/12.

**Keen pricing.** In February 2012, Setsuya Fukunaga was appointed CEO of the company (former CEO of consolidated subsidiary Tamagawa Solar Systems Co Ltd and dismissed in June, 2014) to head the company's entry into solar system sales. Following Mr Fukunaga's appointment the company signed an exclusive sales agreement with China-based GPPV, a photovoltaic (PV) module manufacturer. Underpinned by price competitiveness and aggressive selling in FY03/13, the business started off its first year with an operating profit.

**Focusing on profits.** In April 2012, following a request from a major Tamagawa HD shareholder, Toru Masuzawa became executive director of Tamagawa Holdings, and CEO in June 2012. In June 2014, Tamagawa shifted to a joint leadership system of two representative directors to cope with difficult market conditions. In addition to the incumbent Representative Director Toru Masuzawa, the company promoted Masanori Kobayashi to new representative director with the aim to establish a fair and transparent management base by maintaining and improving its compliance system and ensuring strong corporate governance. In the same month, Yasuhiko Noguchi assumed presidency of Tamagawa Solar Systems after the dismissal of Fukunaga.

The company's main task is to ensure profitability. The focus is on Tamagawa Solar Systems, headed by Mr. Noguchi, and solar park management where FIT pricing is guaranteed by the government. Another priority is ensuring stable profitability at Tamagawa Electronics under the command of Kobayashi.





## News and topics

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### April 2015

On **April 20, 2015**, the company announced that the Ministry of Economy, Trade and Industry (METI) authorized a geothermal binary power plant.

The Kyushu Bureau of Economy, Trade and Industry (under METI) authorized the company's planned geothermal power plant in Beppu (Oita Prefecture) as a facility to generate renewable energy.

As of April 2015, the company holds seven plots for the construction of this facility, offering a total capacity of about 875kW (a one plot, 125kW geothermal plant generates electricity roughly equivalent to a 1MW solar power plant). Having received authorization from METI, the company plans to build the plant and begin selling electricity as soon as possible.

The company plans to make a further announcement once the effect on earnings for FY03/15 is calculated.

### March 2015

On **March 5, 2015**, the company announced revisions to its full-year earnings forecasts.

#### Full-year FY03/15 forecast revisions (previous forecasts in parentheses)

Sales:	JPY5.0bn (JPY4.5bn)
Operating profit:	JPY517mn (JPY506mn)
Recurring profit:	JPY507mn (JPY489mn)
Net income:	JPY455mn (JPY450mn)

#### Reasons for the revisions

The company expects sales and profits to outperform previous forecasts, due to it being able to secure land for a low-voltage solar power plant to be sold in lots, as well as robust sales conditions.

### February 2015

On **February 23, 2015**, the company announced that its mega solar power plant in Tateyama City, Chiba Prefecture commenced operations.

According to the company, connections from its mega solar power plant in Tateyama City to the Tokyo Electric Power (TEPCO) grid have been completed, and sales of power began on February 23, 2015. The company does not expect this to have a material impact on its FY03/15 earnings results.

#### Summary of Tateyama City mega solar power plant

Plant name:	Tateyama Power Plant
Land area:	approx. 35,386sqm
Generation capacity:	1,999kW
Feed-in tariff (fixed rate for 20 years):	JPY40/kWh (tax exclusive)
Estimated feed-in revenue:	JPY95mn/year, JPY1.9bn cumulative total for 20 years

On **February 6, 2015**, the company announced that it will borrow long-term operating funds.

Funds will be loaned to the company from the Chiba Bank in the amount of JPY100mn, with a due date of January 31, 2018.



On **February 3, 2015**, the company announced that a subsidiary will secure a site for a low-voltage solar power plant, to be sold in lots.

Subsidiary Tamagawa Solar Systems Co., Ltd. decided at a meeting of the board of directors that it will secure land for low-voltage power plant, to be sold in lots. According to the company, after acquiring the rights to a feed-in tariff of JPY36 set by the Ministry of Economy, Trade and Industry (METI), it will be able to divide ownership of the low-voltage power plant into 13 lots, to sell to outside buyers. This is expected to boost group earnings.

#### Details of the low-voltage lot sales

Location: Kanoya City, Kagoshima Prefecture

Total area: about 11,070sqm (for all 13 lots)

Output capacity: about 650Kw (for all 13 lots)

Feed-in tariff: JPY36/kWh (fixed for 20 years)

Acquisition date: February 3, 2015

#### **January 2015**

On **January 29, 2015**, the company announced that it would acquire additional land for its geothermal power operations.

#### Purpose

Tamagawa Holdings, which plans to launch a geothermal power generation business, has already acquired land in Beppu City, Oita Prefecture, to build a 125kW plant. The construction is currently underway to providing electricity as early as possible. The company has decided to acquire six additional plots to build plants with a total capacity of 750kW. As a result, the group will have seven plots for a total capacity of 875kW. A 125kW geothermal plant generates electricity equivalent to a 1MW solar power plant. Thus, the company will have power plants with a combined generation capacity of a 7MW solar power plant.

#### The choice of Beppu City

The company will build binary cycle power plants that use underground steam to rotate turbines. Binary power plants generate electricity through a medium that has a lower boiling point than water. There is no need for the company to seek a new energy source because it will use a power source already being used for a hot spring nearby. Thus, the company will be able to start operations within a short period of time at a relatively low cost. In addition, the company has determined that the location is suitable for geothermal power generation because another binary cycle power plant is operating nearby and there is an ample supply of hot water.

#### Overview of the land

- Location: Beppu City, Oita Prefecture
- Size: 2,100sqm
- Output: 750kW (One plot accommodates a 125kW geothermal plant, equivalent to a 1MW solar plant. Thus, six plots of land would allow for power generation equivalent to a 6MW solar plant.)
- Electricity price: JPY40/kWh (fixed for 15 years)
- Expected annual revenue: JPY250mn
- Expected initial year output: 6,800,000kWh
- Transfer date: January 30, 2015



On **January 16, 2015**, the company announced the completion of payments related to the issuance of warrants (with an option to adjust the exercise price).

The payments related to warrants announced on December 26, 2014.

#### **December 2014**

On **December 26, 2014**, the company announced the launch of a new business (geothermal power generation) and the issuance of warrants (No. 6 warrants with an option to adjust the exercise price).

The company held a board meeting on December 26, 2014 and decided to start a geothermal power business.

#### New operations

Tamagawa, which operates a solar-power business, has been seeking another source of renewable energy to bolster its earnings. The company held talks with the holder of rights to the geothermal power source in Beppu City, Oita Prefecture, and conducted feasibility studies. (The company stated that it would build a 125kW geothermal plant and that it would submit the plan to Kyushu Electric Power Co. and the Ministry of Economy, Trade and Industry on December 26, 2014 or later.) The power plant can be built on a small plot of land, and it will provide the company with a stable and efficient source of electricity.

Geothermal power plants, according to the company, are environmentally sustainable because they use steam from underground reservoirs. Unlike solar power generation, geothermal plants can provide stable electricity 24 hours a day, 365 days a year, regardless of weather conditions. Moreover, geothermal plants do not require a large amount of space, allowing for efficient operations. Under the FY2014 feed-in-tariff system, the price for electricity produced by solar power plants is JPY32 per kilowatt and the purchase period is 20 years (consumption tax not included for 10kW or more). In contrast, the price for electricity produced through geothermal power plants is JPY40 per kilowatt and the purchase period is 15 years (consumption tax not included for 15,000Kw or less).

Tamagawa will build a binary cycle power plant that uses underground steam to rotate a turbine. Binary power plants generate electricity through a medium that has a lower boiling point than water. The medium is vaporized with hot water or steam. There is no need for the company to seek a new energy source because it will use a power source already being used for a hot spring nearby. Thus, the company will be able to start operations within a short period of time at a relatively low cost. Most of the steam taken from the underground reservoir will be returned to its source. Therefore, the plant will have little impact on the environment.

The company will spend JPY92mn to build facilities, install pipes, acquire rights to the power source, and purchase land. The project began on December 26, 2014. The company plans to sell electricity starting in July 2015.

Tamagawa also decided to allocate No. 6 warrants to Macquarie Bank Limited. The purchase agreement will be signed after regulatory filings based on the Financial Instruments and Exchange Act.

#### Overview of the warrants

- Allocation date: January 16, 2015
- Number of warrants: 10,000
- Issuance amount: JPY2.2bn (JPY1,960 per warrant)
- Potential new shares: 10,000,000 (1,000 shares per warrant): the number of potential new shares remains unchanged even if the exercise price is changed.



- Amount to be raised: JPY2.2bn (After fees: JPY2.18bn; JPY20mn from warrants and JPY2.18bn from the exercise of warrants)
- Exercise price: The exercise price is fixed at JPY218 per share. However, the company has an option, if necessary for fund-raising purposes, to adopt a mechanism in which the exercise price is adjusted based on the closing price of the stock. The company may adopt the mechanism on January 16, 2015 and afterward upon the board's approval. When this option is adopted, the exercise price will be adjusted to 90% of the closing price on the Tokyo Stock Exchange on a day immediately prior to the effective date of the exercise. (No maximum exercise price has been set.) However, if the adjusted price falls below JPY153 (the minimum exercise price), it will be re-adjusted to JPY153.
- Allocation method: third-party allocation
- Party to which warrants are allocated: Macquarie Bank Limited
- Exercise period: January 19, 2015-January 18, 2017

The party to which the warrants are allocated must guarantee that it will exercise the option and acquire a certain number of shares during the exercise period provided that certain conditions are fulfilled. The company may write letters to the party to which the warrants are allocated and specify the period during which the party must guarantee share purchases. The company may do so up to five times. During the period of guaranteed share purchases, the party must exercise the purchase option and make payments equivalent to the guaranteed exercise price in accordance with the liquidity of the shares at that time. The guaranteed exercise price will be based on whichever the lowest: the average daily trading price during a five-day period prior to the period of purchase guarantee, or the average daily trading price during a 20-day period prior to the period of purchase guarantee.

#### Use of funds

Tamagawa will use the funds to finance subsidiaries' solar power and geothermal power projects.

Use	Amount	Time Frame
To repay loans used to acquire land for a power plant in Misawa City, Aomori Prefecture	JPY250mn	January 2015-March 2015
To invest in, or provide loans to, four subsidiaries that will operate the Misawa plant	JPY879mn	January 2015-March 2016
To invest in, or provide loans to, a subsidiary that operates a power plant in Minamishimabara City, Nagasaki Prefecture	JPY127mn	January 2015-March 2016
To invest in, or provide loans to, a subsidiary that operates a geothermal plant in Beppu City	JPY21mn	January 2015-August 2015
To invest in, or provide loans to, subsidiaries that may operate solar power or geothermal power plants other than those mentioned above	JPY904mn	January 2015-January 2017
Total	JPY2,183mn	—

On **the same day**, Tamagawa released an update on its partnership with ISE Power.

Tamagawa on May 30, 2014 signed an agreement with ISE Power to cooperate on the operation of solar power plants.

Tamagawa and ISE Power agreed that three Tamagawa subsidiaries will acquire a power operator license in Misawa City, Aomori Prefecture from ISE Power, effective December 26, 2014, and build and run a solar power plant. The move is part of the two companies' plan to expand their cooperation in solar businesses.



Tamagawa acquired the land for the power plant on December 16, 2014. The flat land located on the Pacific Ocean side was previously used by Ise Foods Inc. for a chicken farm. The company stated that the land is suitable for a power plant because it has plenty of sunlight and not much snow.

Tamagawa expects to start selling electricity generated at the plant by March 2016. (It is not certain, however, when the company will sign a contract with Tohoku Electric Power Co.)

Tamagawa added that these developments will have little impact on the company's earnings for FY03/15.

Overview of the power plant

Location: 5-chome, Mukawame, Misawa City, Aomori Prefecture

Operator: GP Energy A, GP Energy B, GP Energy C, GP Energy D (wholly owned units)

Premises: 153,000sqm

Capacity: 10 megawatt

Electricity price: JPY36/kWh (tax excluded; fixed for 20 years)

Revenue: JPY390mn a year (estimate)

Initial-year power generation: 10,852,814 kWh (estimate)

On **December 12, 2014**, Tamagawa Holdings Co., Ltd. announced the acquisition of a fixed asset by lease (a solar park).

Subsidiary GP Energy 5 Co., Ltd. acquired a solar power plant being planned for construction in Sodegaura (Chiba Prefecture) with an output of about 1.3MW, after signing a lease agreement with Ricoh Leasing Company, Ltd. (a subsidiary of Ricoh Company, Ltd. [TSE1: 7752]). This lease scheme provides an efficient way for the company to deploy capital.

Leased assets

Name: Sodegaura Solar Park, Chiba Prefecture

Location: Sodegaura, Chiba Prefecture

Details: A complete solar power system

Lease amount: JPY511mn

Acquisition value: JPY360mn

Sodegaura Solar Park, Chiba Prefecture

Area: Approx. 15,000sqm

Output: Approx. 1.3MW

Feed-in-tariff: JPY36/kWh (pre-tax; fixed for 20 years)

Revenue: Approx. JPY60mn per year expected from the sale of electricity

Electricity volume: Approx. 1,733,518kWh (expected to be generated in the first year)

**November 2014**

On **November 25, 2014**, the company announced the establishment of a second-tier overseas subsidiary.

Tamagawa Electronics Co., Ltd., a wholly owned subsidiary of the company, will form a subsidiary in Vietnam on March 31, 2015.

Purpose of establishment

Tamagawa Electronics is engaged primarily in the design, manufacture, and sales of mobile high



frequency telecommunications base stations, and other high frequency devices used in television transmission and public wireless infrastructure. Tamagawa Electronics has been a manufacturer and supplier to major domestic telecommunications manufacturers. In recent years, price competition has caused a greater portion of manufacturing and procurement to occur overseas, and in order to meet this demand and further reduce manufacturing costs for high frequency devices, the company has decided to establish a subsidiary in Vietnam with the intent of expanding its sales overseas and providing higher quality products.

Subsidiary details

Name: Tamagawa Electronics Vietnam Co., Ltd.  
Location: Socialist Republic of Vietnam  
Capital: JPY50.0mn  
Owner: Tamagawa Electronics Co., Ltd. (100%)  
Business: Manufacture and sales of telecommunications equipment

On **November 18, 2014**, the company announced progress regarding construction of the solar park in Goto City, Nagasaki Prefecture.

As disclosed on May 29, 2013, the company has acquired land in Goto City for the construction of a solar park, and is continuing preparations to begin operations. Tamagawa has now received approval from Nagasaki Prefecture to develop in a forested area.

As the company continues preparations to begin construction, it has been applying to relevant authorities for permits required to begin work. Approval from Nagasaki Prefecture to develop in a forested area was one such requirement to begin construction of the solar park. The solar park is planned to utilize a 5.5MW extra high voltage system—the first of its type for Tamagawa.

About the Goto City solar park

- Location: Yoshikugi-cho, Goto City, Nagasaki Prefecture
- Operator: GP Energy 2 Co., Ltd. (wholly owned subsidiary)
- Area: 10 hectares
- Capacity: Approx. 5.5MW
- Feed-in tariff: JPY36/kWh (fixed for 20 years)
- Generation revenue: JPY250mn/year (tentative)
- First-year generation volume: Approx. 6,790,566kWh

The company has modified its capacity estimates for this facility from 6.0MW to 5.5MW.

**August 2014**

On **August 29, 2014**, the company announced the acquisition of fixed assets (land for a solar park).

The company purchased the land in Sodegaura, Chiba Prefecture with the intention of building a solar power plant.

Location and other details of the assets

- Location: Hayashi Village, Sodegaura, Chiba Prefecture
- Area: 15,000sqm
- Acquisition price: JPY125mn
- Transfer date: November 2014.

The Sodegaura Solar Park



- Capacity: Approx. 1,300kW
- Planned output: Approx. 1.7mn kWh / year.

The company has already obtained Feed-in Tariff (FIT) certification for this renewable energy generation facility from the Ministry of Economy, Trade and Industry (METI). The price of the electricity will be fixed at JPY36 per kWh (before tax) for 20 years.

On **August 4, 2014**, the company announced the acquisition of fixed assets (land for a solar park).

The company purchased the land in Yokohama, Kanagawa Prefecture with the intention of building a solar power plant. The details are as follows:

Location and other details of the assets

- Location: Asahi Ward, Yokohama, Kanagawa Prefecture
- Area: 13,640sqm
- Acquisition price: JPY120mn
- Seller: Undisclosed
- Transfer date: August 4, 2014.

The Yokohama Solar Park

- Area: Approx. 17,000sqm
- Capacity: Approx. 1,200kW
- Planned output: Approx. 1.3mn kWh / year.

The company has already obtained Feed-in Tariff (FIT) certification for this renewable energy generation facility from the Ministry of Economy, Trade and Industry (METI). The price of the electricity will be fixed at JPY36 per kWh (before tax) for 20 years.

The company is considering whether to sell the facility in lots or to operate it itself. The company is also in the process of determining any effects on earnings.

**July 2014**

On **July 22, 2014**, the company announced the progress of work on its solar park in Minami Shimabara, Nagasaki Prefecture.

The company has completed construction of a 49kW low voltage generator, and is now expanding the facility into a 1MW solar power plant. In a bid to ensure the smooth operation of the new plant, the company also changed the contract from a land lease contract to a contract establishing superficies (surface rights) on July 22—thus securing the surface rights necessary to build a 1MW solar power plant. The company has already completed development work on the area required for the expansion, and now plans to begin full-fledged construction work.

Overview of the Minami Shimabara Solar Park

- Location: Nagasaki Prefecture, Minami Shimabara
- Operator: GP Energy 3-A Co., Ltd. (wholly-owned subsidiary)
- Area: 22,112sqm
- Capacity: Approx. 1MW
- Tariff: JPY40/kWh (fixed for 20 years)





- Revenue from the sale of electricity (planned): approx. JPY50mn / year
- Output in the first year (planned): approx. 1.3mn kWh.

#### June 2014

On **June 27, 2014**, the company announced a change in leadership.

In addition to the incumbent Representative Director Toru Masuzawa, who will engage in management as before, the company has promoted Masanori Kobayashi to joint representative director. The company hopes for a more streamlines decision making process to cope with difficult market conditions.

With the joint leadership, the company aims to establish a fair and transparent management base by maintaining and improving its compliance system and ensuring strong corporate governance.

On **June 26, 2014**, the company announced the dismissal of its CEO.

As a result of an internal investigation, CEO Setsuya Fukunaga was found to have been engaged in activities that went against the best interests of the company. Although the company has not suffered any direct material losses stemming from his conduct, the investigation concluded that there was a possibility that the company would incur future harm. In light of these facts, the company has removed Fukunaga from the post of CEO.

On **June 2, 2014**, the company announced the cancellation of a capital alliance agreement and the signing of a partnership agreement with ISE Power.

#### Cancellation of capital alliance agreement

Tamagawa Holdings announced that it canceled the capital alliance agreement announced on May 8, 2014, when the company said it formed a business and capital partnership and that it would issue shares through a third-party allocation. The company announced at that time that it would form business and capital alliances with Hikonobu Ise, president and chairman of Ise Foods Inc., and with Yukihiro Akimoto, president of Retail Branding Co., Ltd. However, Hikonobu Ise did not complete payment for new shares and forfeited the right to allotment. Therefore, the company canceled the agreement. As for Tamagawa's plan to acquire shares in ISE Power, the company said it would disclose its decision at a later date after discussing the matter with concerned parties.

#### Signing of business partnership agreement with ISE Power

Tamagawa Holdings on May 30, 2014 signed a business partnership agreement with ISE Power. Tamagawa will maintain a previously agreed-upon arrangement in which the company will operate solar-power businesses through ISE Power, of which Yukihiro Akimoto is the chief executive officer and Hikonobu Ise is the chairman. This partnership agreement was signed after discussion with Ise and Ise Foods Inc. concerning the company's relationship with Retail Branding Co., Ltd.

Under the newly signed agreement, Tamagawa and its subsidiaries will help ISE Power operate solar power businesses. Specifically, Tamagawa will provide ISE Power with information on companies that can plan, supervisor, and construct solar power facilities.

#### May 2014

On **May 29, 2014**, the company announced the partial completion of payment and partial forfeiture of exercising rights for a third-party share allocation.



On May 8, 2014, the company announced the signing of a business and capital partnership and issuance of shares through a third-party allocation. Of the two recipients of the allotment, Yukihiro Akimoto had completed payment as of the allocation date of May 29, 2014. However, Hikonobu Ise did not complete payment, and forfeited the right to allotment.

According to the company, the business and capital partnership and the acquisition of shares in ISE Power to render it an equity-method affiliate will be reevaluated among the interested parties. The company plans to disclose any relevant information as soon as it is available.

On **May 23, 2014**, the company announced a change to capital reserves and the appropriation of retained earnings.

The company decided to add a resolution regarding the change to capital reserves and the appropriation of retained earnings to the agenda at the shareholders' meeting. Effective June 27, 2014, capital reserves will be reduced by JPY573mn, and the equivalent amount will be transferred to retained earnings to be carried forward, in order to compensate for losses.

On **May 15, 2014**, the company announced the acquisition of fixed assets (a mega solar power plant) under a lease agreement.

The company announced that it had entered into a lease agreement with Ricoh Leasing Co., Ltd. (TSE1: 8566) to acquire and construct a 2mW solar power generation system (the total cost of the lease is JPY901mn). Construction plans for this system, located in Tateyama City, Chiba, had been moving forward via a company subsidiary.

Summary of Tateyama City mega solar power plant

Generation capacity: 1,999kW

Feed-in tariff (fixed rate for 20 years): JPY42/kWh

Estimated feed-in revenue: JPY9.5mn/year, JPY1.9bn cumulative total for 20 years

Operating profit: JPY4.5mn/year, JPY1.0bn cumulative total for 20 years

Scheduled date to begin operation: February 28, 2015

\*Revenue is calculated as PV power generation facility with annual power capacity of 1,200MW, with the feed-in tariff calculated as JPY36/kWh for the power price Megasolar plant in Sodegaura, Chiba and JPY40.4/kWh for the Goto Islands power plant

On **May 8, 2014**, the company announced the signing of a business and capital partnership and issuance of shares through a third-party allocation.

Tamagawa will form business and capital alliances with Hikonobu Ise, president and chairman of Ise Foods Inc., and with Yukihiro Akimoto, president of Retail Branding Co., Ltd. The alliance will involve the issuance of new shares through a third-party allocation.

According to Tamagawa, Ise Foods Group (Ise Foods and a company affiliated with Ise Foods and Hikonobu Ise) owns land on which solar-power generation facilities will be built. (The group has already submitted an application to use 27 pieces of land in 10 prefectures for power generation and sell electricity for JPY36 per kWh. Facilities to be built on the land tracts have already been authorized by the minister of economy, trade and industry as power facilities that generate renewable energy and



applications for the sale of electricity to electric power companies have been finished. The size of the land totals as many as 1,419,964 square meters. Solar power facilities with a maximum capacity to produce 76.5 megawatts of electricity are expected to be built. The group also has 30 separate pieces of land applied for production of electricity to be sold for JPY32 per 1kWh.)

Hikonobu Ise will provide the land through Ise Foods to ISE Power. Retail Branding, which is authorized by the minister of economy, trade and industry to operate renewable energy equipment necessary for solar-power generation, will change the name of the operations to ISE Power. Tamagawa will provide its expertise to ISE Power.

Tamagawa will allocate share warrants to Hikonobu Ise and Akimoto, who will exercise the warrants to acquire Tamagawa shares in accordance with the progress of the solar-power project. Tamagawa will use the money to finance its participation in the project.

#### Overview of the issuance of warrants

Allocation date	: May 29, 2014
Number to be allocated	: 14,439 (1 warrant equals 1,000 shares)
Issuance Price	: JPY7,918 per warrant (JPY114,328,002 in total)
Potential new shares	: 14,439,000 (35.0% outstanding shares as of March 31, 2014)
Amount to be raised	: JPY4,648,174,002 (Net: JPY4,622,174,002)
Exercise price	: JPY314 a share
Recipients	: Hikonobu Ise: 12,377 : Yukihiro Akimoto: 2,062

\*The warrants do not have a provision for a revision in exercise price or the number of shares to be allocated. (However, the exercise price and the number of shares could be adjusted.)

#### How and when the proceeds will be used

Use	Amount	Date
To acquire ISE Power shares from RB	JPY10,500,000	May 29, 2014
To invest in ISE Power projects or lend money to the company	JPY4,611,674,002	In accordance with the progress of the project from June 2014 until May 2017

Tamagawa will spend JPY4,622,174,002, which the company will have left after acquiring a stake in ISE Power, to invest in ISE Power projects or lend to the company. ISE Power will use the money to lease the land or acquire the rights to use the land owned by Ise Foods Group to build power-generation facilities. The money will also be used for equipment, construction, electrical facilities, buildings, and other expenses.

#### January 2014

On **January 24, 2014**, the company announced a stock split.

On the record date of February 28, 2014, and the effective date of March 1, 2014, the company will execute a three-for-one stock split. With this, the number of shares outstanding will increase from 13,753,000 to 41,259,000.



## Other

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The company has been subject to harmful internet rumors, and is taking steps to improve its reputation, including filing civil and criminal actions, to bring the perpetrators to account.

## Major shareholders

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Top Shareholders	Amount Held
Bank Julius Bare & Co. Ltd. Singapore Clients	10.26%
Mizuho Securities Asia Limited Client Account 69250601	6.97%
MSIP Client Securities	6.20%
Japan Securities Finance Col, Ltd	5.17%
Hiromasa Shimanuki	4.60%
Yugen Kaisha Sato Sogo Kikaku	3.36%
Barclays Bank PLC Singapore-Client AC-Non Japanese Residents	2.94%
Sada Kubota	2.49%
Masuzawa Toru	2.27%
Rakuten Securities, Inc.	2.08%

Source: Company data, SR Inc. Research

As of March 31, 2015

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## Company profile

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<b>Company</b> Tamagawa Holdings Co., Ltd	<b>Head office</b> Hamamatsu-cho Place 1F, 1-6-15, Hamamatsu-cho, Minato-ku Tokyo, Japan 105-0013
<b>Phone</b> +81-3-6435-6933	<b>Listed on</b> JASDAQ
<b>Established</b> May 7, 1970	<b>Exchange listing</b> August 31, 1999
<b>Website</b> <a href="http://www.tmex.co.jp/english/index.html">http://www.tmex.co.jp/english/index.html</a>	<b>Fiscal year-end</b> March
<b>IR Web</b> <a href="http://www.tmex.co.jp/english/ir-info.html">http://www.tmex.co.jp/english/ir-info.html</a>	



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Creek & River Co., Ltd.	KLab Inc.	Takihyo Co., Ltd.
Daiseki Corp.	LAC Co., Ltd.	Tamagawa Holdings Co., Ltd
DIC Corporation	Lasertec Corp.	TEAR Corporation
Digital Garage Inc.	MAC-HOUSE Co.	3-D Matrix, Ltd.
Don Qijote Holdings Co., Ltd.	Matsui Securities co., Ltd.	TOKAI Holdings Corp.
Dream Incubator Inc.	Medinet Co., Ltd.	Verite Co., Ltd.
Elecom Co.	MIRAIT Holdings Corp.	WirelessGate, Inc.
EMERGENCY ASSISTANCE JAPAN Co.	NAGASE & CO., LTD	Yellow Hat Ltd.
en-Japan Inc.	NAIGAI TRANS LINE LTD.	Yumeshin Holdings
FerroTec Corp.	NanoCarrier Ltd.	VOYAGE GROUP, Inc.
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