

## 【Update Report】

| Company |

**TAMAGAWA HOLDINGS CO., LTD.**

| Code |

6838 : JASDAQ

| Analyst |

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**C&A**

C&A Investment Research

## 【Update Report】

- **Massive strategy came into view through funding of about 2,500 million yen**
- **Capital and business collaboration with Nabiq (a subsidiary of JTOWER)**
  - **New business: "Development of small atomic clocks"**
  - **Significant increase in both revenues and earnings contributed to surplus in the 1Q!**

**Target share price was raised to 5,000 yen.**

Rating continues to be set as "Strong Buy".

### 【Target Share Price】

**Target share price was raised to 5,000 yen.**

(as of Sep/11/2020)

(Mar/31/2020: 4,500 yen)

(Nov/15/2019: 3,500 yen)

(Dec/20/2018: 2,750 yen)

### 【Rating】

Strong Buy (Continued)

(as of Sep/11/2020)

### 【Performance Forecasts】

FY03/2021 (official forecasts)

Net sales: 6,937 million yen; Operating income: 850 million yen;

Ordinary income: 713 million yen; Net income: 499 million yen

(as of Sep/11/2020)

### 【Themes】

EDGs/ESG; defensive; national strategies; renewable energy; JCM: atomic clock; growth; 5G; local 5G;

IoT; analog high-frequency radio; global niche; still-remaining company

(as of Sep/11/2020)

## Massive strategy came into view through funding of about 2,500 million yen

On August 28, 2020, the Company announced funding of about 2,500 million yen by means of offering for subscription rights to shares through third party allocation.

### (Points)

- The fund of about 2,500 million yen will be entirely put in investment. Major use of the fund includes:
  - ① About 1,100 million yen will be put in investment on projects related to domestic/overseas development of renewable energy.
    - Development of renewable energy power stations at various locations in Japan
    - Overseas development of renewable energy power stations
  - ② About 700 million yen will be put in investment related to M&A.
    - Investment on domestic/overseas high-tech companies
    - Investment on industry-university joint research projects (including on-going ones and new ones)
    - Acquisition of local corporations when expanding business to overseas
  - ③ About 700 million yen will be put in investment on R&D projects related to communication technologies such as 5G.
    - Investment on joint research projects with domestic/overseas companies of 5G mobile communication technologies
- Planned period of expenditure: Sep., 2020 - Dec., 2023

### **【Expanded profitability would start driven by full-swing investment business activities】**

In the context of the fund usage as described above and other recent disclosures, expansion strategy of Tamagawa HD as an investment company can be inferred.

The Company has announced that it would allocate its fund of about 2,500 million yen to be obtained this time as follows: About 1,800 million yen to invest on domestic/overseas renewable business and M&A related business, and about 700 million yen to invest on R&D projects related to communication technologies such as 5G.

Announcement of such a huge funding of about 2,500 million yen this time might suggest existence of a number of highly feasible projects behind the scenes. In addition, some recent disclosures revealed the Company's partnering with Nabiq Inc. (a subsidiary of JTOWER Inc.), and announcement of joint development of small atomic clocks with Tohoku University highlighted its gallant efforts into far-sighted innovative communication technologies. This opportunity for fund-raising would enable the Company to start full-swing investment business activities and realize its expanded profitability.

### **【Inference: Massive strategy coming to view】**

Merely as my inference, strategies of Tamagawa HD are as follows.

### **(Context: National strategy to realize "Society 5.0)**

"Realizing Society 5.0" set up by the Cabinet Office of Japan is one of our national strategies. 5G infrastructure in Japan being left behind other parts of the world has currently been developed at a rapidly increasing pace.

For reference, features of 5G are as follows: Ultrahigh speed (100 times vs. 4G); Low latency (shortened to about 1 ms); Massive connectivity (1 million devices per km<sup>2</sup>).

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### **(Bottleneck of 5G)**

The Ministry of Internal Affairs and Communications announced its objective to increase 5G (the fifth generation mobile communication system) base-stations developed by domestic carriers to more than 210,000 by 2023, namely three times larger than the number initially planned, in order to catch up with rest of the world. However, looking into the content further, the strategy means diverting the frequency band already used by existing 4G to 5G and therefore high-speed communication anticipated with 5G would not be practically realized so much. In addition, massive connectivity is also one of appreciable features of 5G. Accordingly, assuming one million 5G devices per 1 km<sup>2</sup> simultaneously connected to a cloud system and processing data, there would be communication traffic jam and possibly in some cases connection speed might be lower than that of 4G. That is, rapid diffusion of 5G devices does not necessarily mean quick realization of comfortable 5G communication.

### **(Local 5G is a MUST)**

Thus, "Local 5G" is a new strategy with which the Company announced this time partnering with Nabiq Inc. (a subsidiary of JTOWER Inc.), which limits areas where 5G communication is available to small-scale private areas within which 5G communication can be fully utilized.

New model of iPhone planned to be released in fall, 2020 is going to be compliant with 5G specifications. So if wide variety of smartphones are to be compliant with 5G specifications at a dash, it can be expected that demands for Local 5G would be explosively greater at factories, hospitals, schools, hotels, train-stations and any other locations. Partnering with Nabiq to realize Local 5G in a straightforward manner would substantially contribute to expanded profitability of Tamagawa HD.

### **(Edge computing)**

Meanwhile, in order to resolve the issue of communication traffic volume, data that have been batch-processed on cloud systems would be shifted to edge computing or some other technologies. Edge computing means, not relying entirely on cloud systems to process data, but a solution / computing model to resolve the issues of burden on high-order system and communication latency by processing data that can be processed on edge computers or some others located near users and terminals (edge side).

Actually, investment on development of this edge computing and edge computers has been accelerated year after year, and it is expected that globally about one trillion yen would be invested in this field by 2024. (Market size of edge computing was 28 billion dollars in 2019; annual average growth rate is 26.5%; and the market is anticipated to reach 90 billion dollars by 2024. *Source: MarketsandMarkets*)

In the field of edge computing, huge amount of data which have been batch-processed on cloud systems would be processed in a decentralized fashion depending on their particular characteristics, such as data processing split to cloud side and edge side (location near individual computers). That is, by processing data, which to date have been batch-processed on cloud side, on also edge side of dispersed countless (numerous) terminals, issues of communication traffic can be mitigated and resolved.

In the future also, communication speed will be accelerated generation after generation such as 5G, 6G, 7G and so on, and data volume will increase to many tens, hundreds and thousands of times greater than today, and at the same time number of edge computers which undertake data processing in a decentralized fashion and burdens resulting from data processing will also increase at an accelerated pace.

Moreover, IoT devices will increase at a dash due to diffusion of 5G communication.

This way, huge volume of data communication enabled by ultrahigh-speed communication would realize various remote-controlled solutions which have not been practicable so far. A good example is a telesurgery (Since 2019, Japan Surgical Society has initiated preparation of guidelines for telesurgery). If communication failure occurs during telesurgery, the situation would be irreparable.

There should never be any communication failure/latency in an environment with ultrahigh-speed communication and huge volume of data communication. Another dimension level of accuracy, synchronicity and reliability will be required, quite different from the past.

#### **(Necessity of small atomic clocks)**

Another dimension level of accuracy, synchronicity and reliability can be realized by small atomic clocks with precision a hundred thousand to one million times greater than conventional ones. On July 6, 2020, Tamagawa HD announced its joint development of small atomic clocks with Tohoku University.

At present, 3 to 5 crystal oscillators are used for a smartphone to maintain its synchronicity, but time deviation of 10 to 20 seconds per year may occur. Communication-enabled devices regularly connect to some large-sized atomic clocks (with accuracy of a hundred thousand to one million times greater than crystal oscillators and time deviation of one second per ten thousands to a hundred thousand years) to adjust their time deviation and maintain accuracy.

Currently the Company, in collaboration with Tohoku University, puts its efforts to development of a small atomic clock which can be integrated into every edge side (edge computers, communication devices, smartphones, PCs, IoT devices, self-driving cars, satellites, drones, radars, mobile phone base stations, WIFI routers, etc.) replacing crystal oscillators. By making atomic clocks smaller and capable of being integrated into every device, there would be no time deviation and synchronicity can be fully assured. Development, production and practical realization of small atomic clocks is a worldwide breakthrough innovation, which would be expected to be integrated into every electronic device around the world. Then business valuation of the Company can be worth, with atomic clock alone, hundreds of billion yen, or even several trillion yen. We would like to focus on the progress of development of small atomic clocks by the Company and pin our substantial hope on them.

#### **(Strategic positioning of renewable energy business)**

Tamagawa HD has put its efforts to renewable energy business for many years. So far it has constructed, sold and owned a number of photovoltaic stations and wind power stations, building up wide variety of know-how about development, operation and other elements.

Producing higher-performance electronic devices and developing communication technologies require large amount of electric power. Moreover, if edge computing leads to decentralization of data processing towards edge side, power consumption of edge side which undertakes data processing will also increase. However, by holding some renewable energy power stations, electricity expense can be reduced. Today it is possible for companies, factories, associations and even individuals to own photovoltaic stations and wind power stations.

In Southeast Asia where living standards (GDP) and IT prevalence are becoming higher more rapidly than Japan, development and IT introduction are advancing fiercely and electricity demand is also rising sharply. Tamagawa HD announced its intent to invest on domestic/overseas renewable energy business, making use of the recent funding. The Company's renewable energy business would be a solution for such sharply increasing electricity demand and expensive electricity in both Japan and Southeast Asia.

## **Capital and business collaboration with Nabiq (a subsidiary of JTOWER)**

On August 26, 2020, the Company announced its intent to do capital and business collaboration with Nabiq Inc., a subsidiary of JTOWER Inc.

### **(Points)**

- Tamagawa HD will acquire new shares of about 50 million yen by means of capital increase through third party allocation offered by Nabiq, and will hold 9.0% of shares.
- Nabiq has developed its business to build up access environment combining existing fixed broadband lines and Wi-Fi application technologies. At the same time, Tamagawa Electronics, a subsidiary of the Company makes use of its high-frequency radio technologies and provides state-of-the-art radio transmission solutions for cell site design which will realize development of Local 5G devices and smooth transmission of high-frequency radio wave.
- Collaborative creation by both companies will enable Tamagawa HD to build up an environment in which installation through to operation of Local 5G can be realized in a straightforward fashion at various locations such as hospitals, hotels, shopping malls and commercial facilities.
- JTOWER (NTT is the major shareholder having 20.5% of shares (as of March 31, 2020)), holding about 54% of Nabiq, has its main business as infrastructure sharing that unite indoor facilities of mobile phones and, in its domestic IBS business, has succeeded in adoption at large-scale facilities and developed various related services including Local 5G.
- This partnering will enable the Company which develops its overseas business in Singapore, Indonesia, Vietnam and other countries, to realize overseas development of radio solutions represented by smart city that makes use 5G technologies concurrently evolving worldwide.

### **(Local 5G can be realized in a straightforward fashion)**

For Local 5G, comprehensive package commercial materials which so far have been dealt with major carriers such as high-frequency radio technologies, license acquisition, design and installation of cell sites, operation of wired/wireless communication, need to be realized at each base of installation. This partnering is to build up a structure in which activities ranging from device development to operation can be realized in a straightforward fashion, and will bring strategic advantages over other competitors.

## New business: "Development of small atomic clocks" (joint research with Tohoku University)

On July 6, 2020, the Company released "Notice regarding commencement of research on small atomic clocks and applications using them".

- This project is a joint research with Tohoku University (Professor Takahito Ono is representative researcher) and aims to develop small atomic clocks which are expected to be mounted on mobile terminals and applications using atomic clocks.

- Already as the first step, a prototype of IoT (Internet of Things) system using an atomic clock was developed.

- Small atomic clocks are approximately 100,000 to 1,000,000 times as accurate as the widely used crystal oscillator and their general-purpose properties are widely utilized for smartphones and their base-stations, PCs, drones, IoT/AI related devices, self-driving cars, satellites, radars and many others, so their potential and contributions to business performance assuming their practical production are invaluable.

- Much hopes may be placed in how the Company would put its efforts to actual utilization and expansion to practical business.

### 【What is atomic clock?】

- An atomic clock is a clock based on the frequency of electromagnetic waves absorbed or radiated by an atom (also including neutral and ionic). At present, there exist optical lattice clocks having the highest precision, cesium atomic clocks used for defining seconds, photoion clocks, hydrogen maser clocks, as well as small atomic clocks which the Company started to develop this time.

### 【Intended use】

Small atomic clocks are approximately 100,000 to 1,000,000 times as accurate as the widely used crystal oscillator and have been expected to be used mounted on artificial satellites, those for time synchronization for information communication network, and as standard signal sources in spaces where GNSS (Global Navigation Satellite System) transmissions from artificial satellites cannot be received. Recently, reduction in electricity consumption and downsizing have been rapidly facilitated and in this connection atomic clocks are anticipated to be mounted in clocks, base-stations and mobile terminals used in the next-generation mobile communication systems for high-precision time synchronization.

\* Please refer to the following article as a reference.

Press release by National Institute of Information and Communications Technology, Tohoku University, and Tokyo Institute of Technology: "To realize atomic clocks as ultracompact system which can be mounted on smartphones"

<[https://www.tohoku.ac.jp/japanese/newimg/awardimg/award20180124\\_01.pdf](https://www.tohoku.ac.jp/japanese/newimg/awardimg/award20180124_01.pdf)>.

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### Overview

#### 【Points】

- 1) Mechanical oscillation of a piezoelectric thin film is used, resulting in substantial advancement towards chipping process.
- 2) Simple and ultracompact atomic clock system using mechanical oscillation of a piezoelectric thin film is proposed.
- 3) Chip area is reduced by about 30%, electricity consumption is reduced by about 50%, and frequency stability is improved by more than one order of magnitude.

■ Ultrahigh-precision frequency source equivalent to GPS satellites is to be mounted in general-purpose communication terminals like smartphones

(excerption)

"Motoaki Hara, chief researcher of Applied Electromagnetic Research Institute under National Institute of Information and Communications Technology (NICT, President: Hideyuki Tokuda), in collaboration with Professor Takahito Ono of Tohoku University and Associate Professor Hiroyuki Ito of Tokyo Institute of Technology, succeeded in development of a simple small atomic clock system without need for the existing complicated frequency multiplication processing.

(...)

Actual utilization of this outcome will lead to substantially smaller atomic clock systems with lower electricity consumption, and make it possible to mount atomic clocks, which have been mounted only in artificial satellites and limited number of communication base stations so far, in general-purpose communication terminals like smartphones as well. This system, not only contributes to greater convenience of communication terminals, but also is suitable for gathering information from sensor network which requires high level of synchronization accuracy and for controlling robots (e.g., indoor drone and diving system) in severe environments where GPS radio wave may not be stable, so creation of a new market would be anticipated."

#### (About the prototype developed by the Company this time)

- The prototype developed this time is an IoT system in which an atomic clock synchronizes accurately at all times and data of time, latitude/altitude, temperature, humidity and atmospheric pressure are transmitted to a cloud system.
- In an IoT system, various devices are connected to the Internet and therefore clocks of individuals devices need to be synchronized to ensure their reliability.
- IoT system which enables accurate time synchronization is expected to be utilized, based on the next generation high-speed and high-density communication, in wide variety of areas such as more accurate self-driving, aerospace, robotics, medical welfare, infrastructure maintenance, and virtual power station control.

#### 【Evolution for the future】

Based on this prototype, the Company will promote development of small atomic clocks and of applications such as positioning using atomic clocks, through joint research with Tohoku University.

## Significant increase in both revenues and earnings contributed to surplus in the 1Q!

(Net sales: +63%, and Ordinary income: +176 million yen, both YoY)

### Points of the 1Q settlement

- 1) Significant increase in both revenues and earnings contributed to surplus in the 1Q.
- 2) In particular, significant increase in both revenues and earnings of in the business segment of electronic & communication devices (Tamagawa Electronics; Net sales doubled and segment income increased by 164 million yen) is a major factor of company-wide surplus.
- 3) Renewable energy system sales business also achieved higher revenues and earnings, going forward to improved segment profitability.
- 4) In renewable energy power station business, both revenues and earnings decreased because of lower revenues from selling electric power due to selling-off two mega-solar stations during the previous term.
- 5) Fortunately there was no major impact of the new coronavirus on the Company, and good financial results indicate good business performance of every business segment during the 1Q, and also the Company has shown its profitability trend which rises especially during the second half every year, so further expansion of profitability for the future would be much expected.

### (Company-wide results)

The Company published its financial results of the 1Q, FY03/2021, achieving significant increase in both revenues and earnings. Annual order-taking: 1,057 million yen (1,239 million yen in the same period of the previous year, i.e. decrease by 14.7% and 182 million yen YoY); Net sales: 1,165 million yen (715 million yen in the same period of the previous year, i.e. increase by 63.0% and 450 million yen YoY); Operating income: 62 million yen ((63) million yen in the same period of the previous year, i.e. increase by 125 million yen YoY); Ordinary income: 59 million yen ((117) million yen in the same period of the previous year, i.e. increase by 176 million yen YoY); and quarterly net profit attributable to owners of parent of 60 million yen ((115) million yen in the same period of the previous year, i.e. increase by 175 million yen YoY), thus the Company achieved surplus in the 1Q which previously had showed negative trend of deficit.

### (Segment 1) Electronic & communication devices business

Business segment of electronic & communication devices operated by Tamagawa Electronics, a fully-owned subsidiary, achieved significant increase in both revenues and earnings, doing quite well. Order-taking: 993 million yen (1,208 million yen in the same period of the previous year, i.e. decrease by 17.8% and 215 million yen YoY); Net sales: 940 million yen (476 million yen in the same period of the previous year, i.e. increase by 97.2% and 464 million yen YoY); Segment income: 124 million yen ((40) million yen in the same period of the previous year, i.e. increase by 164 million yen YoY), meaning Net sales doubled and Segment income increased by 164 million yen, thus achieving surplus. Because substantial expansion of profitability would be expected during the second half and onward, much hopes may be placed for the future.

### < Factors, etc.: Electronic & communication devices business >

#### 【Increased inquiries】

Besides conventional products of analog high-frequency technologies, increasing number of inquiries have been received from new customer and new markets, including optics-related products used for various professional radio communication, digital signal processing devices required for fast signal processing, and products for mm-wave band necessary for wireless transmission of large volumes of data.

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### 【Large scale order-taking, mobile infrastructure, and projects of public offices】

In the field of mobile communication, demands for high-frequency components are increasing, including 5G-related markets. In addition, increasing number of project inquiries have been received from new customers regarding mobile communication facilities for overseas markets.

### 【Increased demands in public sector】

In public sector, demands for optical transmission devices, digital signal processing devices and the likes are increasing, used for disaster control measures, professional-use radio, and monitoring systems.

### 【Strategy】

Future strategy is to try to expand demands in the field of public projects further. In addition, the Company will proactively promote self-developed products including those for installations in the 5G-related markets.

### < About 5G-related contributions to the overall performance >

With respect to 5G, macro cell projects are expected to start in the second half and onward, contributions of which to the performance in the second half would be much expected.

### < No influence of decreased order-taking during the 1Q on the full-term performance >

Order-taking during the 1Q was 993 million yen, namely decrease by 17.8% YoY. It seems there is slight delay in large-scale projects' progress (public sector, public offices, overseas) affected by remote working on the side of customer companies, but concerning mobile infrastructure there is no major impact of the new coronavirus and it is said that there would be no influence on the performance during the current term.

### (Segment 2) Renewable energy system sales business

In the second segment of renewable energy system sales business, Net sales doubled and Segment income increased, achieving higher revenues and earnings. Order-taking: 63 million yen (30 million yen in the same period of the previous year, i.e. increase by 109.9% and 33 million yen YoY); Net sales: 131 million yen (68 million yen in the same period of the previous year, i.e. increase by 91.7% and 63 million yen YoY); Segment income: 29 million yen ((42) million yen in the same period of the previous year, i.e. increase by 13 million yen YoY). So achieving surplus may be expected during the current term.

### < Factors, etc.: Renewable energy system sales business >

- This segment develops and sells photovoltaic stations and small wind power stations.
- Concerning development and sales of photovoltaic stations, the Feed-in Tariff has shown downward trend and therefore the Company deals with site development, purchasing, sales and maintenance on its own in a consistent manner to secure profitability.
- In order for surplus and expanded profitability during the current term, activities of development/sales of photovoltaic stations and small wind power stations still continue to be strongly promoted.

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### **(Segment 3) Renewable energy power station business**

In the third segment of renewable energy power station business, results are as follows: Net sales: 112 million yen (168 million yen in the same period of the previous year, i.e. decrease by 33.2% and 56 million yen YoY); Segment income: 33 million yen (72 million yen in the same period of the previous year, i.e. decrease by 53.7% and 39 million yen YoY).

#### **< Factors, etc.: Renewable energy power station business >**

- Two mega-solar stations were sold-off during the previous term, resulting in lower revenues from selling electric power.
- Photovoltaic stations which are already in operation seem to sell electric power smoothly, including Koujindake Photovoltaic Station (5,847 KW, located in Goto-shi, Nagasaki pref.) in which expansion work completed in March, 2020.
- Development of small wind power stations is also on-going.

#### **< Progress of activities in the business segment of large-scale wind power generation >**

On July 2, 2020, a report entitled "Progress of activities in the business segment of large-scale wind power generation: Part 3" was released. The Company is currently constructing a large-scale wind power station (1.984 MW) in Nemuro-shi, Hokkaido pref. in collaboration with AURA-Green Energy Co., Ltd. Full-scale wind conditions survey was started in April, 2020, and boring survey has been started since June 30. Linkage is planned to start around September, 2020.

#### **(Strategy: Next pillar)**

- The Company considers renewable energy business and environment business in general to be expanded proactively not only in Japan but also overseas mainly in Southeast Asia, aiming at expanding operations of this segment.

## **【Disclosed information】**

### **"Notice regarding successful bid of installations for linear accelerators at next-generation synchrotron radiation facilities"**

On March 12, 2020, Tamagawa Electronics, a fully-owned subsidiary, released a report entitled "Notice regarding successful bid of installations for linear accelerators at next-generation synchrotron radiation facilities".

- Currently a project called "Production of high-frequency circuit and beam monitor circuit used for linear accelerators at next-generation synchrotron radiation facilities" has already started specific activities.
- This bid was won in a public open tender offered by "National Institute for Quantum and Radiological Science and Technology" (QST), proving the high levels of technical capabilities and creditworthiness of Tamagawa Electronics.
- This project is managed by QST as a national entity, and the facility is located in "Highly brilliant 3GeV class synchrotron radiation source for soft X-ray (next-generation synchrotron radiation facility)" on which Photon Science Innovation Center, Miyagi Prefecture, Sendai City, Tohoku University and Tohoku Economic Federation have worked together aiming at starting operations in 2023 fiscal year and built in the new Aobayama campus of Tohoku University. This facility has 100 times greater capability as a light source than other domestic existing synchrotron radiation facilities for soft X-ray (one billion times brighter than sunlight), and is a giant microscope capable of visualizing functions of materials in a nano-level microscopic field.
- This facility makes it possible to overtake the performance disadvantages in the field of soft X-ray in which overseas facilities have so far had advantages. And this is truly a national strategy project for reinforcing international competitiveness of Japan.
- By operating this facility, it is expected that industry-university joint research should be promoted to give rise to some revolutionary innovation.

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### Rating criteria

Ratings are given based on the criteria as shown below.

#### Strong Buy

Share price is expected to outperform TOPIX by 30% or more within one year.

#### Buy

Share price is expected to outperform TOPIX by 10% or more within one year.

#### Neutral

Share price is expected to vary in the range less than +/- 10% of TOPIX within one year.

#### Sell

Share price is expected to underperform TOPIX by 10% or more within one year.

### Points of concern

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