The history of semiconductors started in 1947 with the invention of the transistor and has already passed its 70th-year milestone. Along with the advancement of semiconductors, remarkable improvements in social productivity and standards of living took place throughout the world. In this age of the Internet of Things (IoT), everything is about to be connected via the internet. With new technologies such as big data and artificial intelligence (AI) becoming increasingly widespread, the introduction of the next-generation 5G telecommunications standards is sure to accelerate the emergence of an entirely data-driven society. Naturally, the use of semiconductors and flat panel displays (FPDs) is also expanding as never before, giving rise to new industries. Tokyo Electron’s (TEL) semiconductor and flat panel display (FPD) production equipment forms the foundation for these new industries, and also serves as their core technologies that support innovations and enable the evolution of wide-ranging electronic devices.

Anticipating a continued growth of the semiconductor and FPD production equipment markets, TEL updated its financial model in May 2019. We retained the projections of the model announced last year for net sales and operating income and supplemented these with a new scenario of ¥2 trillion in net sales. We also removed the cap on the ROE target and raised the goal to “over 30%,” which should be attainable within the next five years. To achieve this goal, we are remaining bullish in our investment strategy considering our expected growth level, aiming to obtain the highest earning power in the world by delivering the best products and services. Upholding the vision of becoming “A truly global company generating high added value and profits in the semiconductor and flat panel display industries through innovative technologies and groundbreaking proactive solutions that integrate diverse technologies,” the TEL group is highly motivated and dedicated to the pursuit of continued growth while seeking to maximize its business value. In keeping with the trust and expectations of the stakeholders, TEL is determined to maintain and reinforce its transparent management practices to contribute to both industry and society. We appreciate your continued support for TEL and look forward to sharing a brighter future with you.

Toshiki Kawai
Representative Director, President & CEO
The History of TEL and the Evolution of Semiconductor

The growth of TEL has always been in sync with the history of the semiconductor industry. For approximately half a century, TEL has tirelessly pursued the newest technologies and innovations.

**Consolidated Sales of TEL (Billion yen)**

<table>
<thead>
<tr>
<th>Year</th>
<th>Sales (Billion yen)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>600</td>
</tr>
<tr>
<td>1999</td>
<td>500</td>
</tr>
<tr>
<td>1998</td>
<td>400</td>
</tr>
<tr>
<td>1997</td>
<td>300</td>
</tr>
<tr>
<td>1996</td>
<td>200</td>
</tr>
<tr>
<td>1995</td>
<td>100</td>
</tr>
<tr>
<td>1994</td>
<td>50</td>
</tr>
<tr>
<td>1993</td>
<td>10</td>
</tr>
<tr>
<td>1992</td>
<td>5</td>
</tr>
<tr>
<td>1991</td>
<td>2</td>
</tr>
<tr>
<td>1990</td>
<td>1</td>
</tr>
</tbody>
</table>

**MILESTONES**

- **1963**: Tokyo Electron Laboratories, Inc. is established in Akasaka, Minato-ku with a capital of five million yen invested by Tokyo Broadcasting System, Inc.
- **1964**: TEL acquires importing and selling rights for diffusion furnace manufactured by Thermco Products Corp. (U.S.) and begins sales
- **1968**: TEL-Thermco Engineering Co., Ltd begins domestic production of diffusion furnaces
- **1970**: Listed on the Second Section of the Tokyo Stock Exchange
- **1976**: Pan Electron Inc. begins import and sales of microprocessors as an agent of Intel Corp.
- **1980**: Listed on the First Section of the Tokyo Stock Exchange
- **1991**: Listed on the Second Section of the Tokyo Stock Exchange
- **1999**: Listed on the First Section changed from Category of industry on the Tokyo Stock Exchange First Section changed from "Wholesale Trade" to "Electric Appliances"

**Found as technical specialized trading company**

In 1963, when electronics equipment was still a budding industry, two young entrepreneurs who had left a major trading company founded Tokyo Electron Laboratories Inc. (TEL). Convinced that semiconductors would revolutionize the entire industry, Tokuo Kubo and Toshio Kodaka started to import semiconductor production equipment and other industrial machinery from the U.S. as a foothold, while exporting Japanese-made consumer electronics, such as car radios believing that having both functions as a trading company and manufacturer will be important from the beginning of its founding.

**Shift to a manufacturer in full scale**

By the 1980s, TEL had withdrawn from the consumer electronics export business and started concentrating its resources on importing semiconductor production equipment and other industrial machinery. Because a high level of technical expertise was needed to meet the sophisticated requirements of Japanese customers, the company set up a joint venture with an American semiconductor production equipment manufacturer. The venture gave TEL access to the partner’s technological know-how, eventually enabling TEL to start producing equipment on its own. Having established own operating model, TEL was listed on the First Section of the Tokyo Stock Exchange in 1984.

**Accelerate globalization**

In the 1990s, TEL focused on solidifying its domestic group network by setting up subsidiaries to oversee its service and manufacturing operations. At the same time, overseas subsidiaries were set up around the world to build a direct sales and technical support network, in a bid to become a serious player in the swiftly growing global market. TEL’s overseas sales exceeded domestic sales, illustrating its transformation into a global company.

**Aspire innovation and new growth**

Over 50 years after its inception, TEL formulated a new medium-term management plan comprising growth strategies aimed at reaching World-class profitability by 2015. TEL also renewed the corporate logo, taking the first step toward becoming the new TEL. As we enter the age of IoT and Big Data, the semiconductor and FPD production equipment market is now on the verge of a new era, and TEL will aim even higher as a truly global company.

**Company Info**

- **Established**: November 11, 1963
- **Capital**: 54.96 million yen
- **Representative**: Toshiki Kawai, Representative Director, President & CEO
- **Number of Employees**: 1,559 (non-consolidated) / 13,021 (consolidated)
- **Head Office**: Nakazaki Bld Tower 3-1-3 Akasaka 5-chome, Minato-ku, Tokyo 107-6325
- **www.tel.com**
- **www.tel.com/careers/ *as of April 1, 2019**
An autonomous driving system requires intelligent control of the steering wheel, accelerator, and brakes. This technology for ensuring a safe and enjoyable ride depends largely on semiconductors. Production processes are becoming thoroughly automated as we enter the age of IoT. Semiconductors are crucial for maintaining optimal control of the industrial machinery.

Some wearable terminals can measure and record the users’ health data on the fly. These devices rely heavily on electronic technologies and semiconductors. The collected data can also be used to assist in the advancement of healthcare.

Ever since the invention of the transistor, the demand for semiconductor-based products has grown steadily, giving rise to a wide range of electronic devices. Semiconductor applications are set to expand further, requiring even higher levels of chip performance. TEL is investing some 10% of its revenues into R&D, not only to strengthen its existing areas of expertise but also to aggressively cultivate new business fields.

TEL’s Projection of the Future

TEL’s focus is on two core product categories: semiconductor and flat panel display (FPD) production equipment. Building on the technological expertise and know-how that the company has been cultivating since its inception over 50 years ago, TEL remains devoted to promoting a dream-inspiring society. From Everyday Items to Equipment in Space

Semiconductor chips are used everywhere today, from smartphones that we regularly carry around to satellites that orbit high above the Earth. Their use is not limited to digital devices but extends to diverse everyday applications, including cars, industrial machinery, home appliances and public infrastructures.

Evolving in Step with the Semiconductor Market

As we enter the age of the Internet of Things (IoT), semiconductors with far higher processing power than ever before will be needed in huge quantities. As a supplier of equipment that produces semiconductors, TEL is evolving in step with the advancement of the semiconductor market.

Investing in Advanced Technologies for the Next Generation

Ever since the invention of the transistor, the demand for semiconductor-based products has grown steadily, giving rise to a wide range of electronic devices. Semiconductor applications are set to expand further, requiring even higher levels of chip performance. TEL is investing some 10% of its revenues into R&D, not only to strengthen its existing areas of expertise but also to aggressively cultivate new business fields.

5G changing the world

The fifth-generation telecommunications standards, or 5G, has been the subject of many discussions lately. With 5G technology, the communication speed is expected to become 100 times faster than the current 4G, with just one-tenth latency (time lag) and 100 times more simultaneous connections. The technology will undoubtedly facilitate the massive transmission of data, bringing us fully into the age of Big Data. As the implementation of 5G will expand the range of semiconductor applications and necessitate more innovations, TEL’s semiconductor production equipment business is most likely to grow further.

Automobiles

An autonomous driving system requires intelligent control of the steering wheel, accelerator, and brakes. This technology for ensuring a safe and enjoyable ride depends largely on semiconductors.

Industrial Machinery

Production processes are becoming thoroughly automated as we enter the age of IoT. Semiconductors are crucial for maintaining optimal control of the industrial machinery.

Healthcare

Some wearable terminals can measure and record the users’ health data on the fly. These devices rely heavily on electronic technologies and semiconductors. The collected data can also be used to assist in the advancement of healthcare.
To Deliver the Best Products and Best Services

As we enter the age of IoT, semiconductors and flat panel displays are finding broader applications than ever before, while customers’ requirements for production equipment are becoming even more diverse and complex. That is why TEL is not only committed to developing innovative technologies, but also to delivering reliable support services. By contributing to the customers’ value creation processes, TEL seeks to become their irreplaceable strategic partner.

TEL’s Business Operations

R&D

Manufacturing

Sales

Support

TEL’s Global R&D Bases

TEL has several principal development facilities in Japan, which are cooperating with a network of global R&D bases, consortia, and research institutes to maintain a steady flow of innovations.

- TEL R&D base
  - Tokyo Electron Technology Solutions
  - Tokyo Electron Kyushu
  - Tokyo Electron Miyagi
  - TEL Technology Center, America
  - TEL Technology Center Korea
  - TEL Technology Center, Taiwan

- Consortium
  - CNSE (Albany, New York)
  - imec (Leuven, Belgium)
  - CIRCE (Grenoble, France)
  - IME (Singapore)

Development and Manufacture

Create a leading-edge

Semiconductor and flat panel display technologies hold the key to tomorrow’s social infrastructure, which explains why they are entering a new phase of growth. Ensuring sustainable business growth under these circumstances requires timely delivery of competitive products with high added value. Accordingly, TEL is focusing on developing advanced next-generation products powered by breakthrough technologies.

Sales and Support

Provide optimal products

TEL provides optimal products to customers by discussing advanced technology and deciding specifications. We also perform repairs and maintenance for semiconductor production equipment installed at customers’ sites and propose and perform functional enhancements and field upgrades to extend the service life of the equipment. Anticipating the ever-diversifying industry trends and customer needs, TEL offers global support services using its network of field engineers.

Field Solutions

Provide services that meet various needs

TEL provides high-quality services to its worldwide customers, ensuring the products address their needs to the fullest extent. With an installed base of 69,000 equipments at customer sites around the world, TEL offers total support for its products throughout their lifecycle, drawing on the specialized know-how and experience of its service engineers.

Services

- Procurement and support of refurbished equipment
- Upgrading of installed equipment
- Service-life extension support for equipment that has been out of production for at least eight years
- Supplying proprietary spare parts and providing parts repair services
- Remote equipment monitoring and optimization service (TELeMetrics™)

Passion for Quality

One of the keys to successful manufacturing is a “front-loading” or taking early steps to ensure high quality, typically in the product development/design phase. Scrutinizing the design to eliminate problems before the start of manufacture can significantly improve quality. In addition to this front-loading approach, independent quality assurance measures are implemented at each work process at TEL. Because of every single work team offers its guarantee of quality, the end products are necessary for very high quality.
Exposure
The surface of semiconductors is intricately structured, with feature dimensions typically in the order of tens to hundreds of nanometers. This is a scale comparable to that of viruses and the diameter of the DNA double helix.

As nanotechnology-enabled semiconductor production equipment shrinks the feature size of semiconductors, it became possible to make mobile devices such as laptops and smartphones thinner, faster, and lighter.

More about Nanoscale at: www.tel.com/museum/

Semiconductor Production Equipment
Semiconductors are critical components of diverse electronic applications, including PCs, smartphones, automobiles, and home appliances. To manufacture semiconductors, special-purpose machinery known as semiconductor production equipment is required. TEL develops and manufactures semiconductor production equipment covering all major chip-making processes, and supplies the equipment to semiconductor manufacturers around the world along with excellent support services. Many of our products command leading shares in the global market.

FPD Production Equipment
Flat panel displays (FPDs) are ubiquitous today as they are commonly used in PCs, flat screen TVs, and smartphones. Having gained considerable manufacturing experience through the semiconductor production equipment business, TEL has been applying its expertise to the development of FPD production equipment as well. A wide range of products that TEL has produced to date has satisfied many FPD manufacturers with particular needs for enhanced quality, cost reduction, large area processing, and so forth.
TEL operates its business in countries and regions across the world. The company is supporting the global electronics industry with its expansive business presence in Japan, the U.S., Asia, and Europe.

**GLOBAL SCALE**

**Business Operations Spanning the World**

TEL operates its business in countries and regions across the world. The company is supporting the global electronics industry with its expansive business presence in Japan, the U.S., Asia, and Europe.

**Composition of Net Sales by Region**

- **Korea**: 24.3%
- **China**: 24.1%
- **Japan**: 16.3%
- **North America**: 10.3%
- **Taiwan**: 12.9%
- **Europe**: 7.3%
- **S.E.Asia, Others**: 4.8%

**Source**: VLSI Research, June 2019
TEL’s CSR Policy

TEL not only pursues sustainable operations from the viewpoint of corporate governance, compliance, and ethics, but also creates value through its products and services, and engages in corporate social responsibility (CSR) activities to become a part of the solution to the social problems.

TEL’s Sustainability Programs for the Continued Advancement of Society

Under the slogan “Technology for Eco Life,” TEL assesses the environmental impact of its entire value chain and conducts business in a manner that minimizes harmful effects on the environment. For a business entity to increase its value—not only in the short term but also in medium to long term—it is essential to develop a sense of social responsibility by examining possible future scenarios. All of us at TEL are working in concert to reduce the ecological burden arising from our products and business offices, while also striving to develop innovative manufacturing technologies that help reduce the power consumption of electronic products.

Medium-term Environmental Targets for 2030

<table>
<thead>
<tr>
<th>Products</th>
<th>Facilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduce per-wafer CO₂ emissions (vs. 2013)</td>
<td>30% reduction</td>
</tr>
<tr>
<td>Total CO₂ emissions (vs. 2018)</td>
<td>20% reduction</td>
</tr>
</tbody>
</table>

Initiatives for ESG

Environment
As it is vital for a business to be aware of the planet-wide environmental impact of its activities, TEL is committed to reducing the output of CO₂ throughout its value chain. TEL is pursuing product designs that use less energy and is encouraging a further reduction in the consumption of power, water, and chemical substances at its offices and factories.

Society
TEL is making every effort to provide a good working environment for its employees. Examples include the promotion of the employee’s well-being, provision of employee-friendly vacation and leave of absence programs, and promoting awareness and respect for human rights. These measures can help elevate employee morale and bring harmony to the workplace.

Governance
To reinforce environmental, social, and governance (ESG) activities and achieve sustainable growth, we believe it is essential to build an effective governance mechanism. TEL is encouraging lively discussions on this subject at the board meetings and has been regularly upgrading its global compliance management program.

TEL FOR GOOD™ is a brand name for the company’s social contribution activities. The four focus areas of these activities are innovation and technology, education, environment, and community involvement. TEL hosts various social contribution events and programs, donations, and volunteer activities around the world under this brand.

TEL has outlined specific sustainable development goals (SDGs) and is striving to attain them through every facet of its operations.