



TOSHIBA

Toshiba in ASIA PACIFIC

CORPORATE
PROFILE

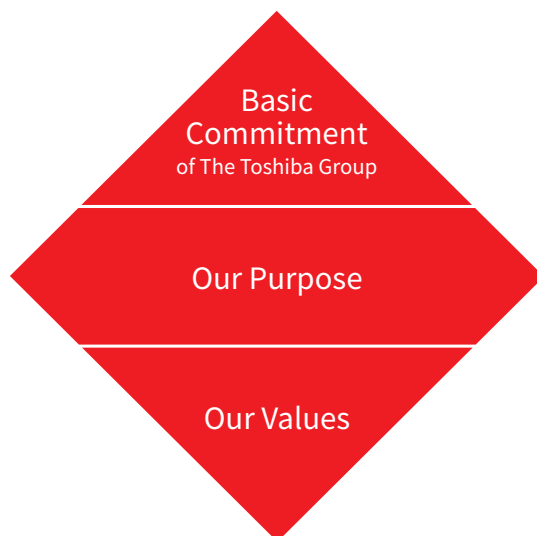
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Essence Of Toshiba

The Essence of Toshiba is the basis for the sustainable growth of The Toshiba Group and the foundation of all corporate activities. It has three components: Basic Commitment of The Toshiba Group, Our Purpose, and Our Values.



Basic Commitment Of The Toshiba Group

Committed to People, Committed to the Future.

At Toshiba, we commit to raising the quality of life for people around the world. ensuring progress that is in harmony with our planet

Our Purpose

We turn on the promise of a new day.

Our Values

Do the right thing.

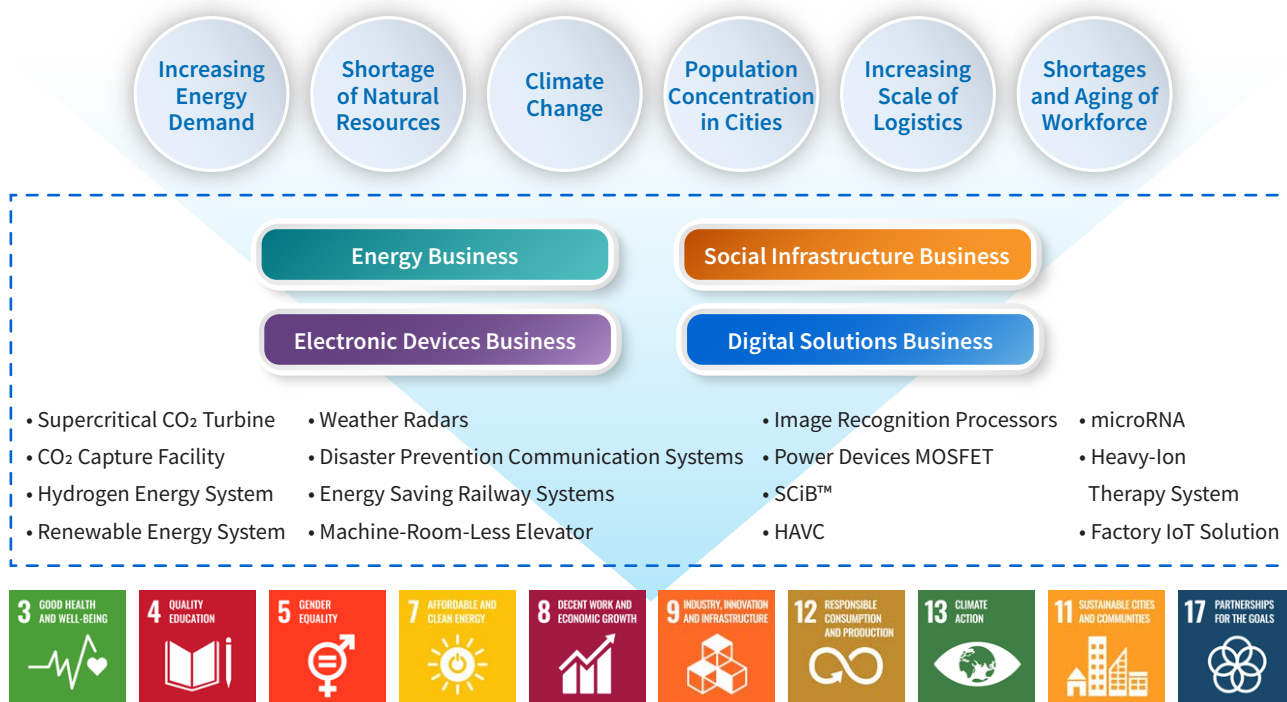
Look for a better way.

Always consider the impact.

Create together.

Toshiba Group Business and SDGs

Aim to Achieve SDGs through all Business Activities



*SDGs: Sustainable Development Goals

Message From Asia Corporate Representative

Asia-Pacific region has always been an important market for Toshiba, with demand for energy, infrastructure, urbanization and mobility forecast to grow expeditiously. As the regional headquarters for Southeast Asia, India and Oceania, Toshiba Asia Pacific is strategically positioned to be closer to the market in order to understand and react rapidly to the dynamic environment.

In today's world where there are pressing challenges for electricity supply to fuel fast-growing economies, Toshiba has been leading the future in electrification with innovative technologies including advanced ultra-supercritical thermal power that offers high performance and reliable power supply. Asia Pacific has an abundant energy source including hydro, geothermal, solar & wind and Toshiba is here to respond quickly to its electricity's demand and delivering this through our integrated transmission & distribution systems – ensuring a stable and equitable energy supply for buildings, factories and homes.

As infrastructure needs become increasingly complex, Toshiba offers technologically advanced solutions including integrated transportation systems and highly sophisticated water management systems. In addition, Toshiba delivers reliable building solutions with your ease and comfort in mind. There is unprecedented surge in data storage and management and it is altering business models and forcing industry players to remain nimble.

With a strong foundation forged by more than 140 years of experience and a resolve to completely revamp ourselves through digital transformation, we seek to be the world's leading Infrastructure Services Company that delivers meaningful solutions that are sustainable and dynamic for generations to come. By combining creativity with technologies that we have cultivated, we strive to realize Toshiba Next Plan, to confront increasingly serious social issues, and turn on the promise of a new day.



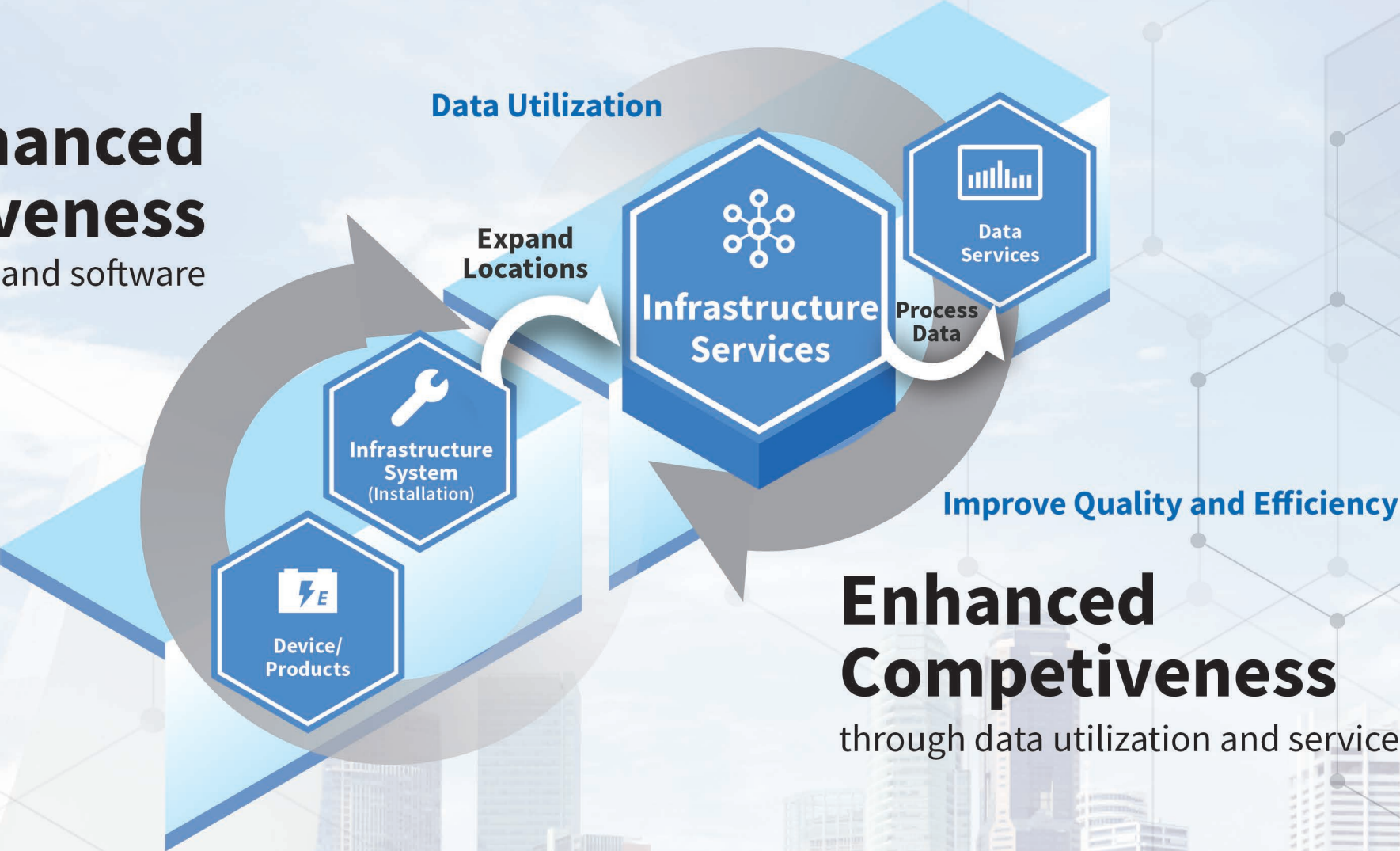
丸山竜司

Mr Ryuji Maruyama
Corporate Representative – Asia, Toshiba Corporation
Managing Director – Toshiba Asia Pacific Pte. Ltd.

To Enhance People’s Lifestyle in Asia Pacific with **Infrastructure Services**

Enhanced Competitiveness

through differentiated hardware and software



Enhanced Competitiveness

through data utilization and service quality

TRANSMISSION & DISTRIBUTION

HYDRO POWER

GEOTHERMAL POWER

THERMAL POWER

PHOTOVOLTAIC POWER

WIND POWER

ENERGY STORAGE

HYDROGEN ENERGY

WATER TREATMENT

INDUSTRIAL SYSTEMS

ELEVATOR SYSTEMS

AIR CONDITIONING SYSTEMS

STORAGE SYSTEMS

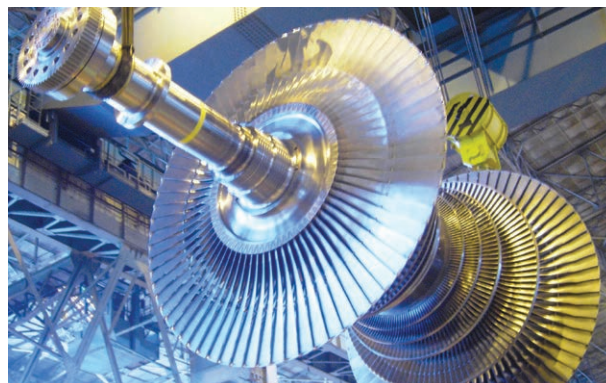
MFP/POS SYSTEMS

SECURITY & AUTOMATION

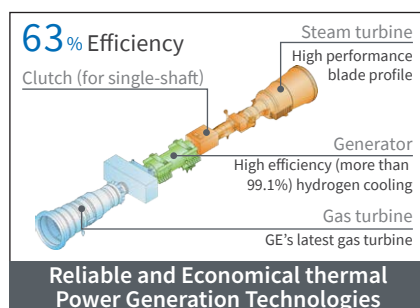
RAILWAY SYSTEMS

Thermal Power

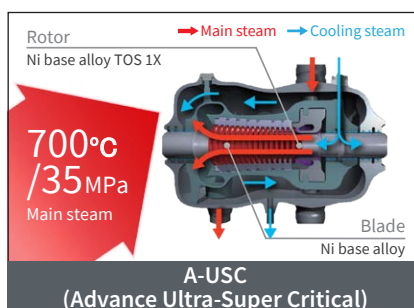
Electricity has played a fundamental role to support industries and society throughout all ages. Toshiba's thermal power generation systems have been highly acclaimed worldwide for their economic efficiency, safety and environmental performance for a stable power supply that can be routinely used whenever and wherever needed. Amid an increasing demand for electric power and environmental consciousness, the role expected of thermal power generation is becoming more and more important. Beside supplying equipment, Toshiba also provide plant engineering, production/procurement and construction work to maintenance and support services throughout the power plant's life cycle. With aims to provide a stable power supply that is in harmony with the environment, Toshiba will continue to lead our society to a sustainable future.



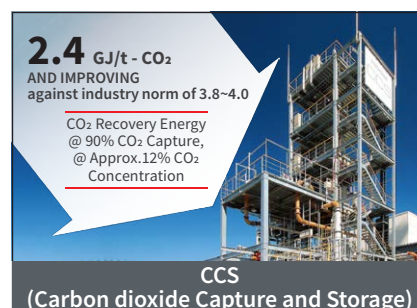
Toshiba's Advantage Solution



Toshiba has been providing high performance and high quality equipment based on a great wealth of experience and the latest research & development.



A-USC allows a great improvement in efficiency, achieve a 46% plus increase in net thermal efficiency by harnessing a main steam pressure of 35MPa at a main steam temperature of 700°C.

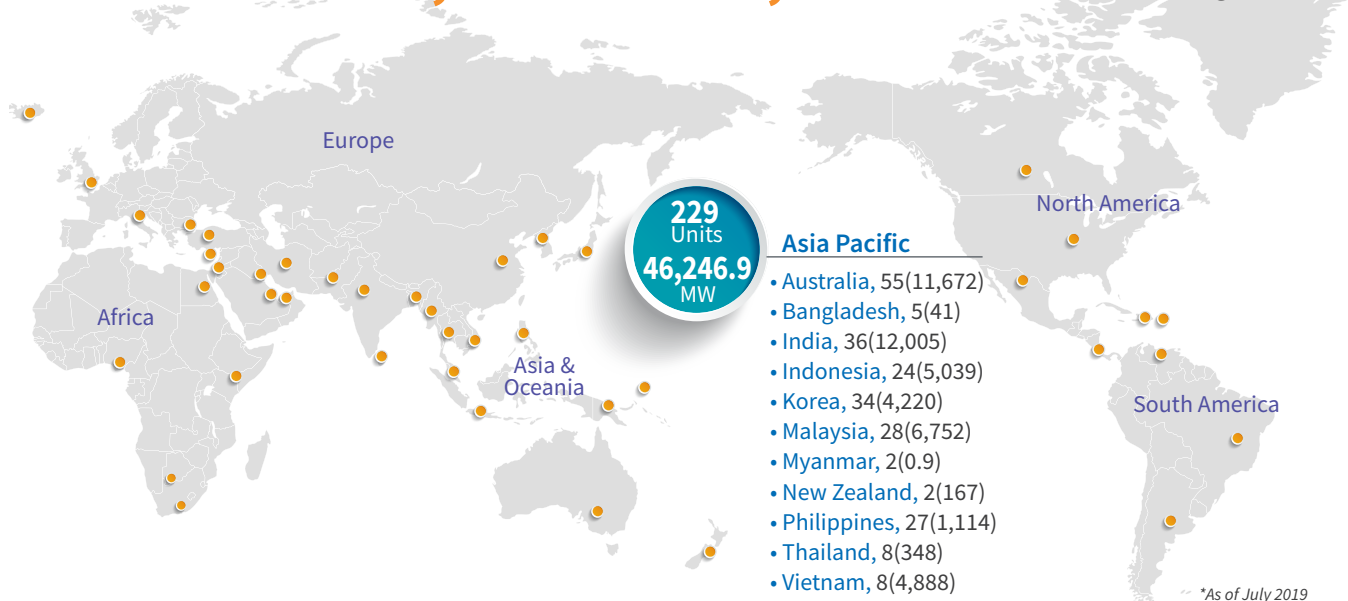


CCS takes the captured and separated CO₂ and stores it by compressing and liquidizing it to seclude it from the atmosphere.

Delivery Record of Turbines

After the delivery of the first turbine in 1927, Toshiba Group has manufactured a lot of turbines, and the total number of turbines shipped from Keihin Product Operations in Yokohama, Japan and from the Factory of Toshiba JSW Power Systems in Chennai, India exceeds 2000 units.

Worldwide Installed*: **2,008** Units **208,036** MW **42** Countries/Regions

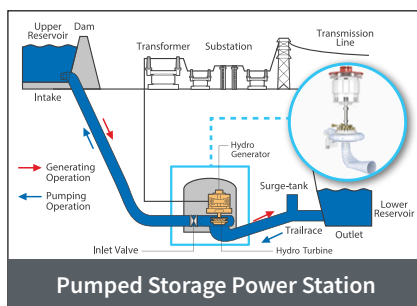


Hydro Power

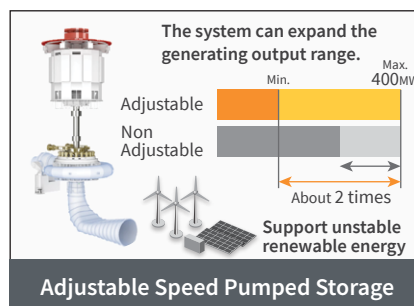
“Hydro power” is an eco-friendly renewable energy that generates power by harnessing the potential energy of water. In the field of pumped-storage power generation that addresses a varying peak load, Toshiba is at the world’s top class in achievements and technological level amid the trend toward a higher head, larger capacity and variable speed. Toshiba not only designs, manufactures and delivers the main equipment, such as hydro-turbines and hydro-generators, but it also delivers various components needed for power plants, and provides a total engineering service package from procurement and installation to testing and commissioning works.



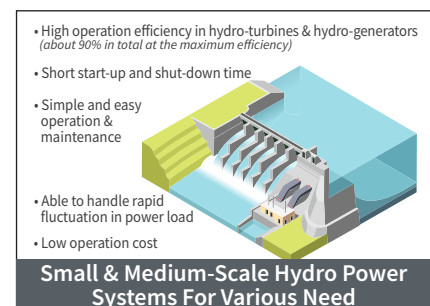
Toshiba’s Advantage Solution



Toshiba offer high-reliability, high-performance hydro power generation system that suits the topographical conditions and customer needs.



Adjustable-speed pumped-storage power generation system that enables fine supply-demand adjustment by changing the rotational speed of pump-turbine



Small & medium-scale hydro power systems can be installed for various needs, like rivers, discharge channels, industrial and agricultural waterway etc. Toshiba provide a wide range of product line-up from standard units to made-to-order system

Delivery Record of Hydro-Turbines and Hydro-Generators

Toshiba has delivered a total of over 2,300 hydro-turbines (over 61,000 MW) and over 1,800 hydro-generators (over 74,000 MVA), to more than 40 countries across the world, and has developed technology and broad experiences for more than a century.

Worldwide Installed*: **Hydro-Turbines 2,385 Units** **Hydro-Generators 1,859 Units** **44 Countries/Regions**



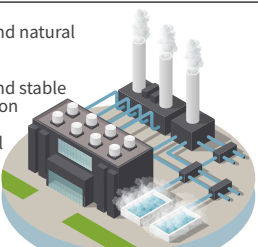
Geothermal Power

Geothermal power is an independent and stable power generation system that utilizes the thermal energy of the Earth's magma. The steam flow used for geothermal power is generated by rainwater seeping underground and being heated by the magma. The amount of heat that magma produces is limitless, and rainfall is infinitely repeated, as a result of one of the Earth. In 1966, Toshiba delivered a set of 20 MW geothermal turbine and generator to Japan's first geothermal power plant, and has since supplied many geothermal power generation systems throughout the world.



Toshiba's Advantage Solution

- Independent and natural stable energy
- Independent and stable power generation
- No external fuel required
- Eco-friendly



Optical Solutions For Various Geothermal Conditions

Geothermal power is free from effects of seasonal and weather factors. Its offer stable and sustainable generation which does not require external fuel. Therefore, is free from import-related factors like economies in supply fluctuations. Geothermal power is eco-friendly energy with minimal CO₂ emissions.



Super Rotor Technology

To resolve the issues like reduction in performance due to attenuation, aging and high corrosive substances. Super rotor technology is a collective term for Toshiba's technologies to counter such issues and improve the reliability and performance of geothermal turbines.



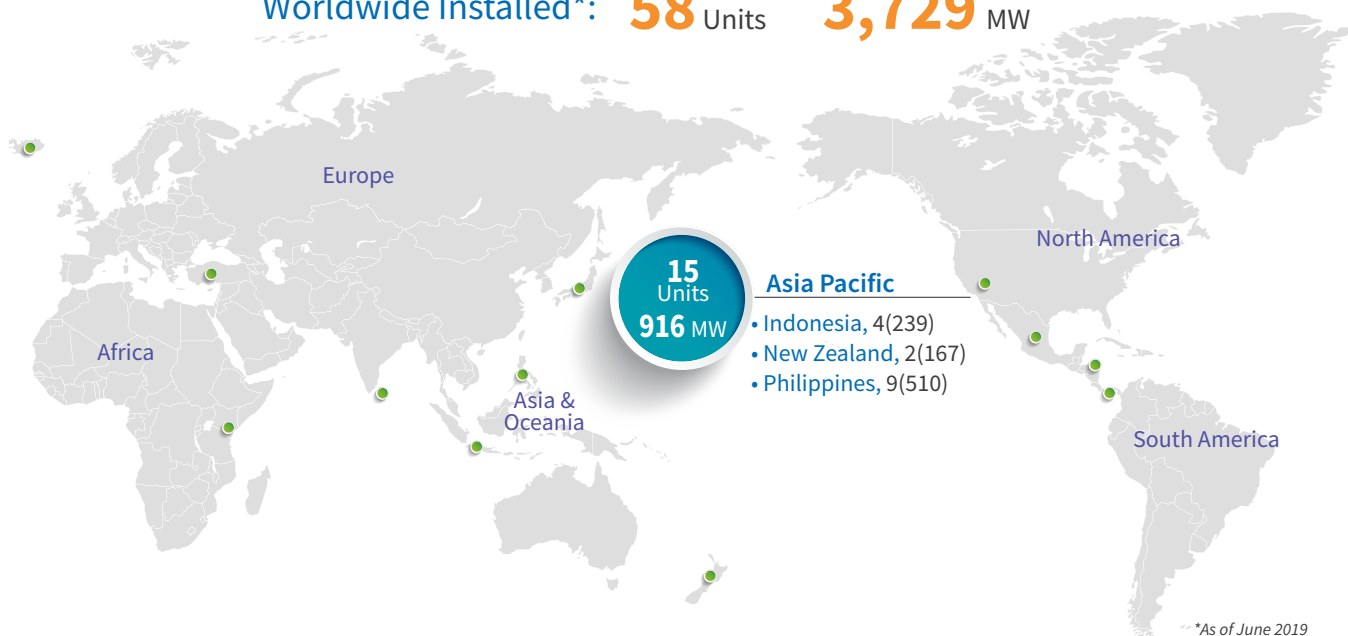
Extensive Product Line-up

Toshiba offers an extensive line-up of products with various outputs ranging from 1 MW to 200 MW. In particular, our compact geothermal power system Geoportable™ is suitable for a geothermal well with an output of 1 MW to 10 MW.

Delivery Record of Steam Turbines for Geothermal Power Plants

As of June 2019, Toshiba has delivered steam turbines for geothermal power plants for a total output of about 3.7 GW. This accounts for top level share in the world on an installed capacity basis.

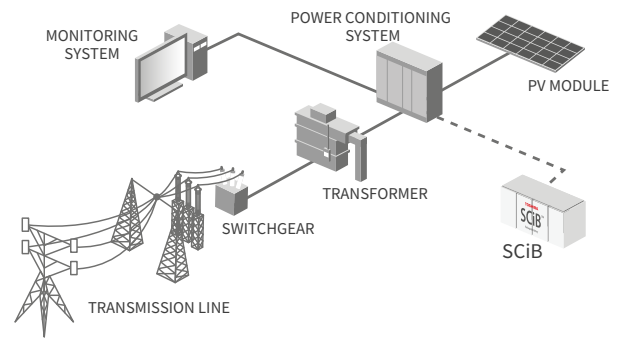
Worldwide Installed*: **58** Units **3,729** MW



*As of June 2019

Photovoltaic Power

Toshiba Group taps into the comprehensive engineering capabilities it has cultivated through large-scale plant development and other initiatives to offer systems for commercial and industrial applications. From the installation of solar modules to interconnection with power systems, Toshiba is driven by a total engineering approach that encompasses analysis, design and execution as it strives to provide mega-solar systems with high efficiency and long-term stability.



Optimise Energy Power

A photovoltaic power generation system needs to convert direct current (DC) electricity generated by sunlight into alternating current (AC) electricity. Therefore, it is important to create an efficient system designed to minimize conversion loss. Toshiba is capable of devising the optimum photovoltaic power and energy solution for specific projects.



Wind Power

From 2012, Toshiba has been engaged in the wind power business. Toshiba has installed several wind farm in Japan and is promoting globally with our world-wide network. Our technology, knowledge and quality control cultivated from thermal and hydraulic power is applied to our wind business expansion.

Farm Planning

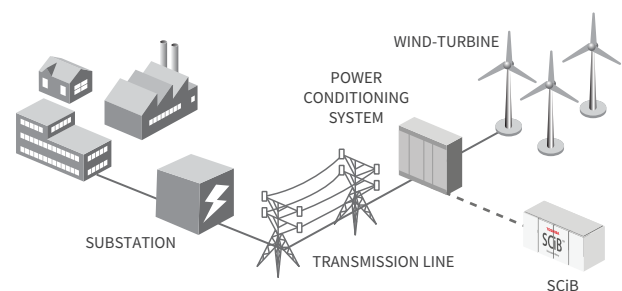
Toshiba supports customers from assigning candidates sites including geological or environmental study, handling laws/regulation matters, and construction planning.

Maintenance

Toshiba can propose the best mainenance method which realizes high availability and low cost operation. WTGs can be remote-monitored by Toshiba; and will discuss the operation and maintenance with customers closely.

Storage and Combination

Toshiba can provide various solution to stabilize the grid with batteries and/or hydrogen energy system.



Transmission & Distribution

The power industry is required to flexibly respond to the environment surrounding the power transmission and distribution, including distributed energy systems, energy liberalization, and large-scale natural disaster preparedness. In order to realize a more comfortable and environment-friendly smart energy society, we are taking actions towards solving social issues through our transmission & distribution business.



Substation Equipment



500kV Gas Insulated Switchgear



Power Transformers



Surge Arresters



Medium Voltage Switchgear



Distribution Transformer



Protection Relays

Delivery Achievements of GIS, Protection Relay & Transformer



GIS

1,189 Stations 8,766 Bays 7,451 Units



Protection Relay

48 Countries



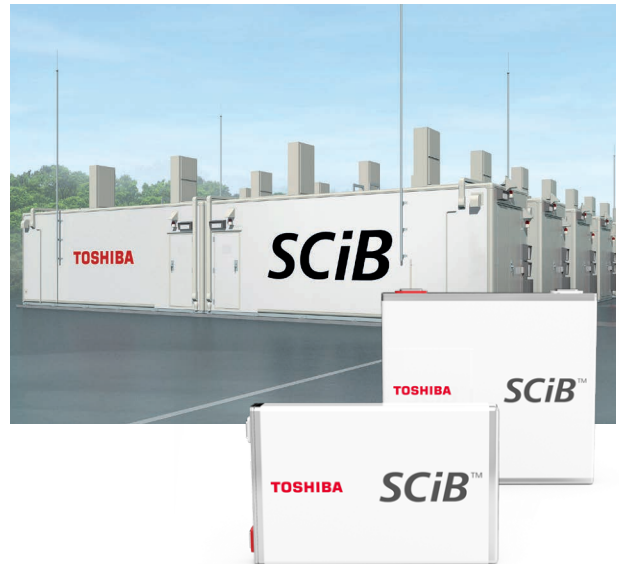
Transformer

45 Countries



SCiB™ Rechargeable Battery

Toshiba SCiB™ is a highly safe rechargeable battery with six outstanding characteristics. By using oxide-based materials (Lithium Titanium Oxide), SCiB™ is designed to prevent thermal runaway resulting from short circuiting caused by physical stress. Furthermore, SCiB™ has various superior characteristics, including a long life exceeding 20,000 charge/discharge cycles, rapid charging time of 6 minutes, input/output current densities comparable with capacitors, and operation at temperatures as low as -30°C. SCiB™ has been widely used for vehicle, industrial and infrastructure applications, including automobiles, buses, railroad cars, elevators and power plants.



Key Features

Long Life



More than 20,000 charge-discharge cycles*

Safety



Less prone to rupture and ignition

Low Temp. Operation



Can be used at temperatures as low as -30°C

High Input & Output



Charged and discharge at high current rate

Rapid Charging



Rechargeable in 6 minutes*

Wide Effective SOC Range**



High effective TESS due to V-SOC control

*20Ah cell level test result under fixed conditions **SOC: State of Charge

Examples of SCiB™ Applications Supporting the Community



Suzuki Motor Corporation
Mild Hybrid

SCiB™ has been adopted for low fuel consumption technologies that effectively use regenerative energy at deceleration.



Proterra, Inc.
Rapid Charge-Type Electric Bus

SCiB™ has been adopted for rapid charge-type electric bus in operation in California and 11 other states of the United States.



TOBU Railway Co. Ltd.
Regenerative Battery Device

SCiB™ has been adopted for regenerative battery devices to effectively use the electricity generated by deceleration of a railcar.



Tohoku Electric Power Co. Inc.
Battery System for Substation

SCiB™ has been adopted for measures to balance the demand and supply due to diffusion of recyclable energy.



L-Kougen Co. Ltd
Solar Power Light

SCiB™ has been adopted for street light systems that store the electricity generated by solar power panels and activates night lights.



Toshiba Elevator & Building System Corporation
Elevator Battery System

SCiB™ in TOSMOVE NEO, a paid option for uninterrupted operation in the event of a power outage, for the Toshiba SPACEL-GRII machine room-less elevator

H2One™ Off-Grid Solution

H2One™ off-grid solution is a one-stop solution package converting the production of hydrogen to its use in fuel cells using renewable energy.

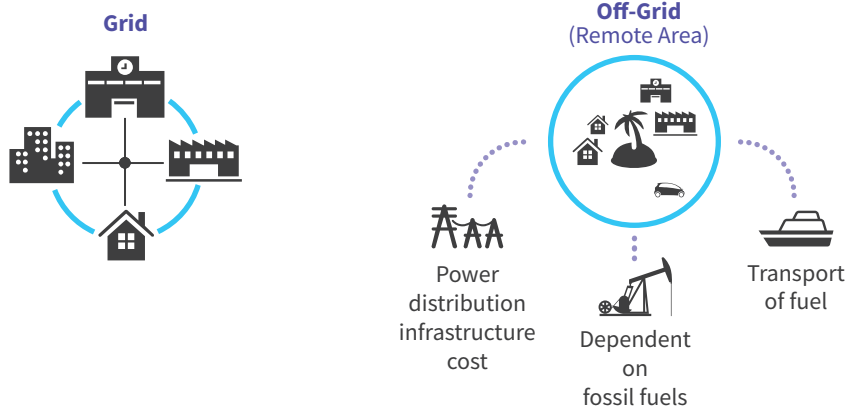
Renewable energy can be stored for a long period of time by converting it to hydrogen to aim for the local production and local consumption of energy.



Off-Grid Energy Issue

Many off-grid areas rely on high-carbon power generation alternatives, such as diesel generators. Where the area is remote, the shipping costs for these fuels can be considerable. Renewable energy provides a green local alternative. However, it is intermittent.

- Hydrogen energy storage can smooth intermittent generation

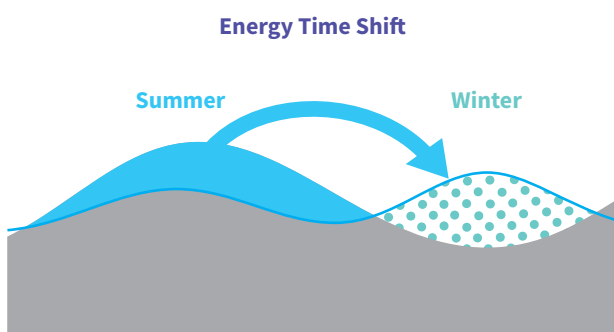
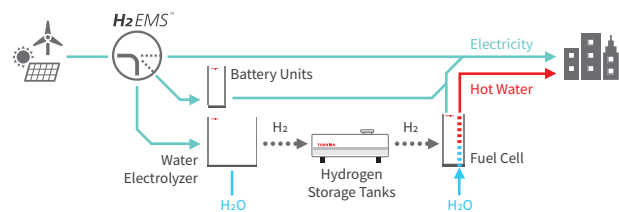


Off-Grid Energy Solution for Isolated Community

H2One™ off-grid solution can provide a stable power without having to rely on diesel generator and without being influenced by the weather 24 hours a day and 365 days a year.

- No fossil fuel, only renewable energy and water
- CO₂ free combined heat and power
- H₂ energy storage to realize year-round stable renewable energy
- Easy transport and installation

Perfect CO₂ Free System



Security & Automation Solutions

Postal Automation Systems

At Toshiba, we draw on over 40 years experience in the supply of letter handling machines to deliver systems supporting high speed processing and high address reading rates. Our machines offer cost-effectiveness, ergonomic designs, small footprints, low noise levels, low power consumption and low life-cycle costs.

Culler Facer Cancellor (CFC)

This highly efficient pre-processing system culls letters and post cards according to their format (size / thickness) and identifies and cancels the stamps. It also integrates an address reading function.

OCR Letter Sorting Machine (LSM)

A high speed, highly stable system, available with either a 2- or 4-layer stacker, designed for effective utilization of space and user-friendly operation.



Barcode Reader

An excellent barcode recognition rate for color printed mail and envelopes is enhanced by a design that allows installation in systems from other manufacturers.

Banknote Processing Systems

Toshiba has been providing solutions for cash handling businesses - central banks, commercial banks, cash-in-transit (CIT), and security printing works - for over 40 years.

Our banknote processing machines offer excellent capabilities with high throughput, with no loss of the accuracy essential for the reliable banknote sorting.



Face Recognition Systems

Toshiba has more than 20 years of experience and a proven track record in face recognition technology, achieving outstanding face recognition performance, high processing speeds, and we have also received excellent feedback in third party evaluations.

Toshiba Face Recognition System (FRS) allows developers to add face recognition function into their own applications, provided by Software Development Kit (SDK)

Face Region Detection

Feature Point Extraction

Pattern Matching



Similarities get featured



Database

Railway Solutions

Battery Solution for Railway Systems

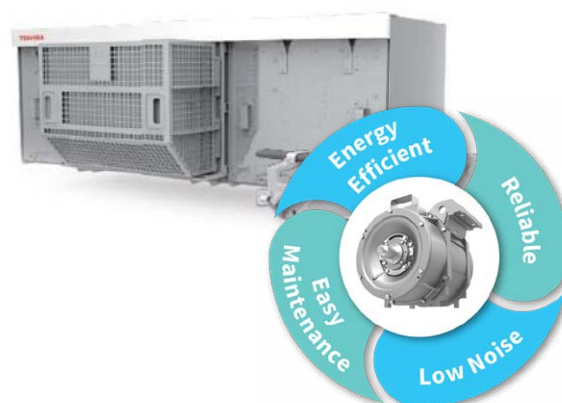
Toshiba's high performance lithium ion rechargeable battery - SCiB™, has excellent safety, high input & output, rapid charging, low temperature operation and long life characteristics. SCiB™ has minimal degradation even after more than 20,000 cycles of 0%~100% charge/discharge which makes it suitable for railway system applications.

SCiB™ is applied for both on-board Traction Battery System and substation Traction Energy Storage Systems (TESS) to efficiently store surplus regenerative energy and reuse it to accelerate trains. These battery solutions can also be used as an emergency power source for accelerating trains to bring passengers to the nearest safe location in case of power failures.



Propulsion Systems

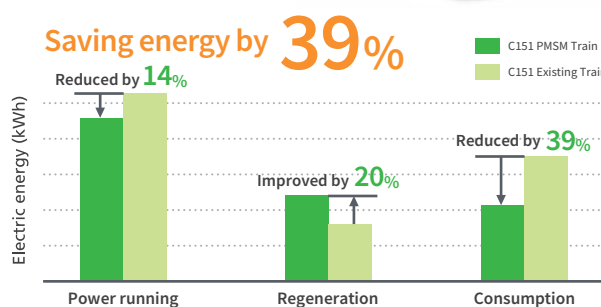
Toshiba's propulsion system adopts a permanent magnet synchronous motor and contributes to decreases power consumption by 39% compared to conventional induction motors*1, and also reduces the maintenance time. The traction converter that uses the state-of-the-art SiC device achieves 38% downsizing and weight reduction compared to conventional equipment*2.



PMSM (Permanent Magnet Synchronous Motor)

Toshiba started developing the PMSM system in the early 1990s. Utilising data accumulated through R&D and field tests, Toshiba established the PMSM main circuit system technologies for railway cars.

The most strong point of PMSM system is high efficiency. There is no secondary copper loss, decreased primary copper loss, iron loss and others. Overall loss, drastically reduced to less than 50% compared to induction motor.



Air Conditioning Systems

Toshiba adopts a highly efficient compressor to operate air conditioning system, and by employing inverter control it achieves optimized operation to reduce power consumption and improve comfortability.



1* From test results based on JIS E6102 (PMSM manufactured in 2010 and measured in May of 2012, and IM manufactured in 1992 and measured in April 2012). Calculation conditions: Includes the regenerative brake performance improvement effect from control that used adhesion limit relaxation and regenerative braking power as a train unit.

2* Based on comparison between existing equipment and new equipment in the 02 series for Tokyo Metro Marunouchi Line.

Industrial Solutions

Toshiba first produced motors in 1985, and our products are used in diverse industries ranging from oil, gas and utilities to pharmaceutical and agriculture. We have been evolving to continuously lead industrial development and technology advancement, and provide efficiency for various industries.

As many of our products are manufactured under one roof, we can offer customized solutions to meet specific industry needs. We offer the best solution for oil market packaged as a complete solution, increasing maximization of system uptime and mean time between failures.



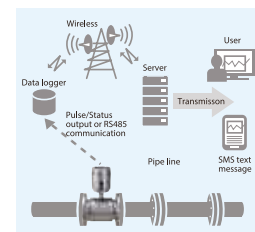
Industrial Systems Products



Medium Voltage Motors



Variable Frequency Drives



Flow Meter

Water & Environmental Solutions

Since 1972, Toshiba has been contributing to water supply and sewerage infrastructure development, by offering electrical equipment and related engineering services. Through the years, we have expanded to new segments such as industrial water treatment plant development and water infrastructure outside Japan.

With our comprehensive technologies, we seek to address customer issues from business planning to operation management, by providing highly reliable water and wastewater treatment system solutions. We remain committed to contribute to the creation of environmentally advanced communities with sustainable water infrastructure in response to regional, cultural and environmental requirements.

Business Fields

Solutions for Water Supply and Sewerage Systems

- Water Supply and Sewerage
- Operation and Maintenance
- Seawater Desalination
- PPP
- Rainwater Drainage



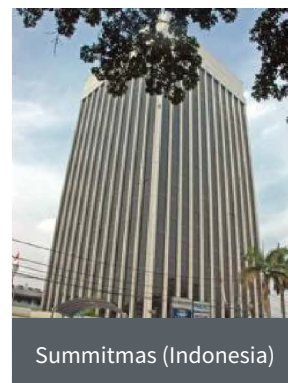
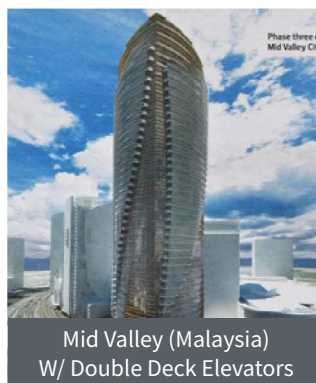
Solutions for Industrial Water Treatment

- Water Supply
- Wastewater Treatment
- Water Recycling



Elevators Solutions

Leading the way to a green future, Toshiba creates cutting-edge technologies that offer various eco-friendly products to the market, with safe, comfortable and environmentally-conscious design. One renowned example is the Green Concept Elevator. With the “SPACEL-III” and “ELCOSMO-III” series, elevators consume 50% less energy compared with their precedents. Reduced energy consumption is accomplished by state-of-the-art technology such as a regenerative system, LED lighting, lightweight cabin design, advanced control system and PMSM motor. Newly-developed eco-conscious dry tape lubrication oil free roller guides provide enhanced smooth riding comfort for users.

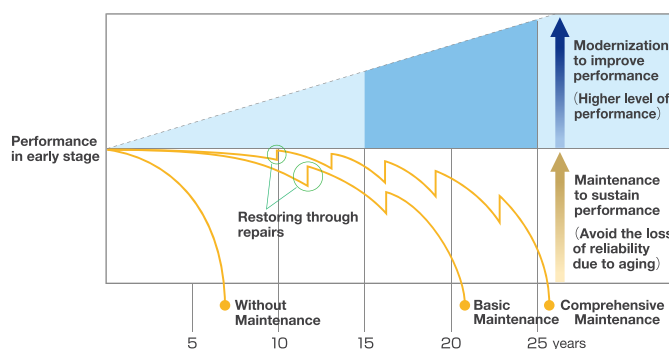


ELFRESH

Toshiba has developed a new modernization package of “ELFRESH”. It is line-up of exchange only the necessary part from the existing elevator. One distinctive feature of ELFRESH is to exchange the existing induction motor to PMSM motor. At the same time, it is driven by the new inverter control system. This is made possible with our customized inverter control systems and newly traction motor technology, reducing the high voltage consumption from the existing building, extending the elevator system life span.

Performance and Expectation of the Lifts System over its Entire Lifespan

Even when regular maintenance is carried out, lifts performance is limited by its original design factor and deterioration due to aging. With the increase in demand and higher expectation from customers, the gap between the performance and expectation has widen over time. “ELFRESH” can rejuvenate the aging lifts system and enhance the performance to keep up with the customer’s expectation.



Solutions for “ELFRESH”



Energy Saving

Development of new technology continuously to achieve lower energy consumption



Comfortability

Deliver noiseless and excellent riding experience with Toshiba advance technology.



Environmentally Conscious

Toshiba makes positive approaches for environmental conservation.



Technology

Deliver safe and high-quality products from leading edge technology.



Safety

Up-to-date safety device to ensure passenger’s safety.

Air Conditioning Solutions

Almost 40 years ago in September 1981, Toshiba invented the world's first residential inverter air conditioner, which was also a world-first in 1980, for residential use. The new unit was hailed as a revolutionary technology in terms of energy efficiency and it was registered as a "One Step on Electro-Technology" by the Institute of Electrical Engineers of Japan in 2008.



Toshiba's passion for innovation and constantly works to ensure that our air conditioners help protect the environment while delivering reassurance and reliability to users around the world, earning us ISO 14001 certification. Toshiba has also received international praise for designing energy-efficient split and VRF products that operate on R32 and R410A Refrigerant.

Air-Cooled Chillers

Universal Smart X, innovative air-cooled modular chiller system gives industry leading space-savings and optimizes building performance for industrial clients. Up to 128 Universal Smart X module units can be combined generating up to 8,960 horsepower to meet demand and backup units ensure limited chilling downtime in the case of an outage. A state-of-the-art petroleum storage facility in Singapore recently adopted our Universal Smart X module system in order to maximize efficiency and reduce its carbon footprint and ultimately realized cost savings of up to 30%.



Variable Refrigerant Flow System

In 2016 Toshiba Air conditioning won the "Manufacturer of the Year Award" for Toshiba VRF, "SMMS-e" in the Standalone DX systems category in Dubai, UAE which was conducted by Climate Control Middle East. SMMS-7 and MiNi-SMMS 7, the latest commercial air conditioning for various buildings, has been creatively developed with inverter technology that is evolving every year.



Residential and Light Commercial Air Conditioner

Toshiba Residential and Light Commercial Inverter Air Conditioner is another level of technology that has been developed for your lifestyle today, tomorrow and in the future. The new model design creates refreshing air to better the quality of life with less energy consumption, and easier control with just one touch and experience



Multifunctional Printer

Toshiba, a world leader in advanced technology, offers a wide array of e-STUDIO Multifunction Printers, which provide customers with a variety of document management solutions, while enhancing security, user-friendliness, efficiency and more. Office workflows can only get simpler and swifter with Toshiba e-STUDIO solutions. Coupled with the refined quality and technology advancement of Toshiba e-STUDIO Multifunction Printers, the e-STUDIO solutions empower users with the capabilities to print, search, save, edit, distribute, manage, track and enhance specific business workflows. Furthermore, all these are done while keeping business information and intelligence securely protected throughout the whole document cycle of print, copy, scan, fax and many more. Providing a greater peace of mind together with advancement in technologies, e-STUDIO solutions are taking businesses into a completely new generation.



e-STUDIO3508LP/4508LP

e-STUDIO3518A/4518A/5018A/8518A

e-STUDIO5516AC/7516AC

Barcode and Label Printers

The BA410T combines user-friendly performance and space-saving design based on ergonomic engineering. The body is crafted from metallic frame, robust and durable for long-term use in tough environment. Its durability and usability meet the requirement of manufacturing and distribution field. Availability of large volumes of media/ribbon decreases printer downtime and increases operation efficiency.



BA410T

Point-of-Sales System (POS)

The ST-F20 has a compact design due to combining the main unit and display. Two colours, black and white, are available to match the decor and atmosphere of your shop. The bright, easy-to-read display is operated by touch, making it as easy to use as a smartphone. In addition, the edge-to-edge all glass front makes it drip- and dust-proof, and makes cleaning a snap.

A high-performance CPU and large memory, up to 8 GB, are combined to provide excellent performance and smooth operation. For mass storage you can choose between HDD and SSD. A dual-screen configuration is available, to suit your shop's environment. The tilt-able display can be angled up to 90 degrees for easy viewing.



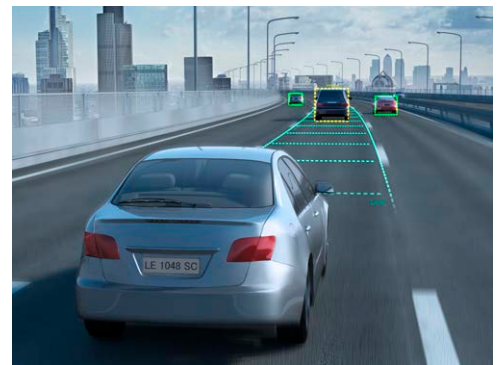
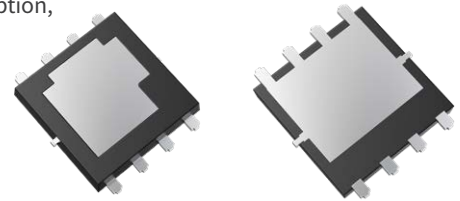
ST-F20

Semiconductors

State-of-the-art electronics are contributing more than ever, from cutting energy consumption to the control and operation of automobiles, and the data storage. Toshiba promotes advances in products that help all of us to live more comfortably and safely.

In Discrete Semiconductor, drawing on capabilities honed over many years, Toshiba offers a wide variety of high performance, high reliability products in three major product categories: power devices, small-signal devices and optocouplers. All play a vital role in reducing energy consumptions in product areas extending from home appliances and mobile devices to automobile and infrastructure-related applications

In System LSIs, Toshiba's focus is on digital ICs, including the Visconti™ image recognition processor; microcontrollers; and highly efficient analog ICs with low power consumption, particularly motor drivers for the automotive and industrial markets, where high performance, high level integration, low power consumption and competitive costs are essential.



Hard Disk Drives (HDDs)

Toshiba develops, manufactures and supplies a wide range of innovative storage products, among them large density Nearline HDDs for data centers, a focus product, and other HDDs suitable for use in enterprise servers, PCs, surveillance systems, NAS, recorders, gaming, and automotive applications. We also offer personal storage (external hard drive). We advance HDD technologies and innovation and supply products that secure high levels of customer satisfaction in a broad spectrum of storage market segments.

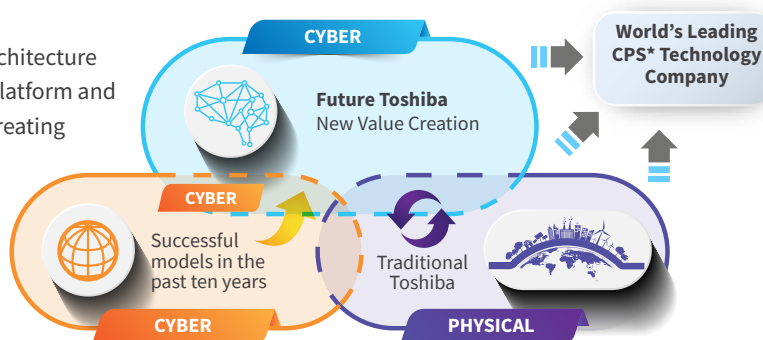


INTERNAL Hard Drives & **CANVIO™** Series Portable Hard Drives

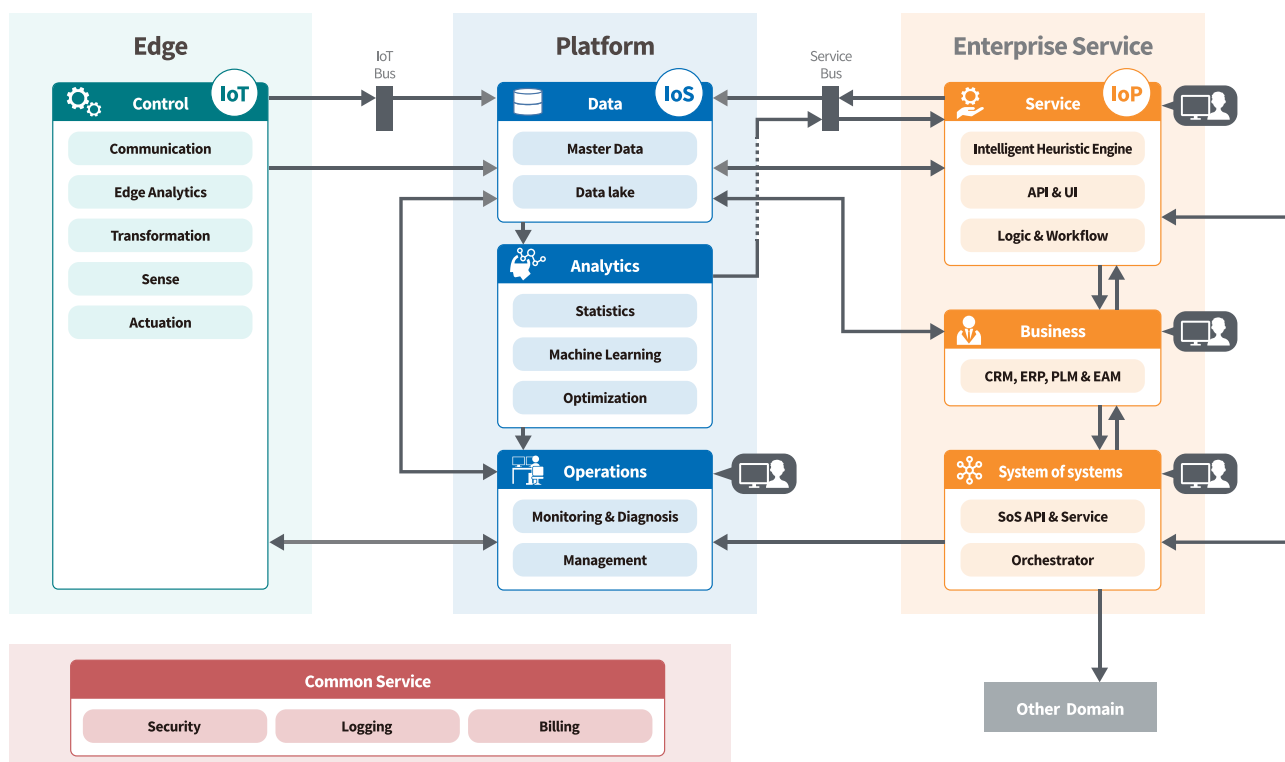
Cyber Physical Systems (CPS)

In recent decades, global development has centered on the IT revolution, particularly the internet and semiconductor technology, which has created immense value to the society's evolution and progress. Looking ahead, we see a future where real world technologies (Physical technologies) will fuse with digital and internet technologies (cyber technologies). Through years of experience in development of a wide range of technologies, Toshiba Group will enter into a new world where manufacturing and services evolve together which Toshiba calls CPS (Cyber Physical Systems).

With the establishment of Toshiba IoT Reference Architecture (TIRA), a three-tier architecture comprising edge, platform and enterprise services, it is used as a blueprint when creating different Industrial IoT services or CPS related businesses. By making application programming interface (API) open, not only Toshiba, but third parties, can also create services. The data can be downloaded from or connected to any devices using a standard interface.



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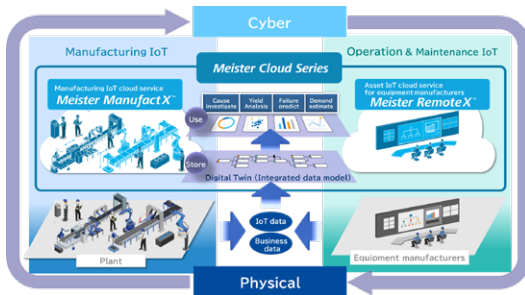
Toshiba has developed ifLink®, which is a platform which people can easily and freely build up an IoT system by connecting different devices, tools and services in physical world, by just providing “if” and “then” recipe to the application. ifLink Open Community, established in November 2019, for the purpose to promote and advance the co-creation of innovative, user-first services built on a shared, simple to use IoT platform.

Toshiba Group has also introduced CPS business models to BtoB areas, based on our established businesses, such as Virtual Power Plants (VPP), railway operation plan systems and factory IoTs.

Digital Solutions

Meister Cloud Series

Meister Cloud Series consists of subscription-based services that combine applications and templates designed for plants and equipment manufacturers with digital twins. By utilizing Toshiba IoT Reference Architecture, IoT services were developed to enable traceability and data sharing throughout entire manufacturing value chains, not only within plants but also at overseas business sites and suppliers. By providing cloud services that combine applications and templates with advanced data models of digital twins, it creates value added services and sophistication to the manufacturing processes at plants, and to operation & maintenance (O&M) work for plant equipment.



Manufacturing IoT
(FUJIKOSHI Corporation)



Remote monitoring
(Kurita Water Industries Ltd.)

Toshiba Analytics AI

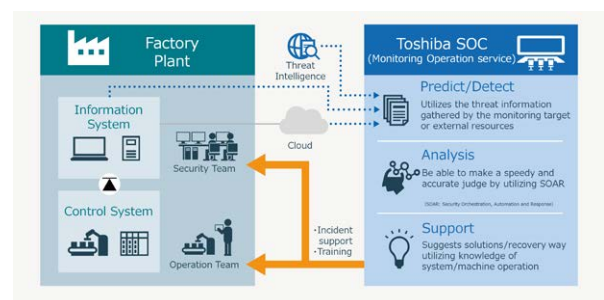
By utilizing our strengths in physical components such as energy, social infrastructure and devices, we can further enhance our contribution by applying cyber technologies such as AI to them. Toshiba's CPS technology creates added value by collecting physical data, understanding and analyzing it by cyber, and feeding back to physical. SATLYS is an analytics AI that support CPS, and supports system optimization, automation and autonomy through analysis and prediction, which can be applied across various business fields.

AI: Artificial Intelligence



Security Solution

Digital transformation led by the Internet of Things (IoT), has accelerated major changes to industry & social infrastructure, and creates connection across products, information systems, and control systems. However, this comes with risk of a wider range of channels for cyber-attacks and other threats. Security threats are no longer problems for individual companies and plants alone, but have become major problems for society as a whole. To combat this threat, comply with international standards, Toshiba has systematized its extensive experience in providing security operation management for both information and control systems.



Software Development

As part of our efforts to become a world-leading CPS technology company, we provide various software development solutions, such as embedded software, IT solutions, R&D (AI, IoT, Big data analysis) and development support for India and ASEAN markets.

Located in Vietnam and India, our software development centers are established with the purpose to develop high quality & high reliability software across various industries such as social infrastructure systems, digital solutions and factory automation systems. Global IT training sessions are also conducted to educate & share software development knowledge.

Enhance Toshiba Group Software Development Capabilities through Creation of Attractive Products

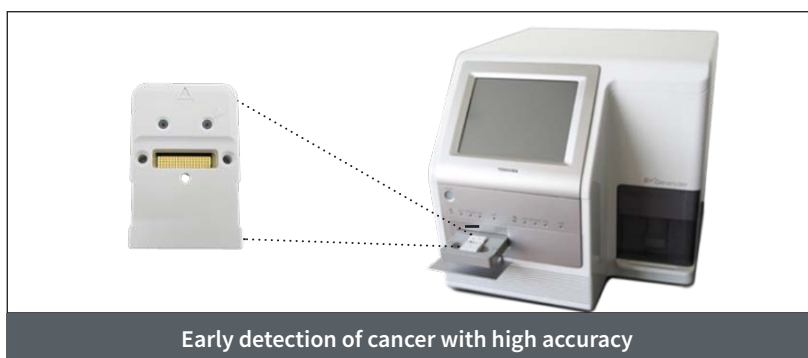
Cutting Edge Technologies

Over 140 years, Toshiba group has consistently contributed to the society by providing technologies and solutions by integrating years of experience and capabilities in the physical field of manufacturing industry with strengths in cyber technologies derived from over 50 years of research in AI. We strive to continue this legacy through creation & development of cutting edge technologies to resolve social issues, in fields such as precision medicine and quantum application.

Precision Medicine

With technology advancement in the medical field, Toshiba also play a part in developing new technology areas of precision medicine. Through years of research and collaboration with research and medical institutes, Toshiba has developed new technologies such as microRNA detection technology system and Heavy Ion Therapy system to enables high accuracy and high precision in cancer detection and medical treatment.

Micro RNA



Heavy Ion Therapy



Quantum Applications

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Quantum Key Distribution (QKD)

A global leader in developing high-speed quantum cryptographic systems, Toshiba has pioneered several technologies which contribute to its high performance QKD solution. The company has the capability to achieve secure data communications across fibres longer than 150km.

Visit Toshiba QKD website: www.toshiba.co.jp/qkd/en/index.htm



Simulated Bifurcation Machine™

Originated from research on quantum computing, the SBM is a practical and ready-to-use ISING machine that solves large-scale “combinatorial optimization problems” at high speed. This high-speed algorithm can be applied to daunting but essential tasks such as identifying efficient delivery routes, determining the most effective molecular structures to investigate in new drug development, and building portfolios of profitable financial products.



Toshiba Group places top priority on human life, safety and legal compliance, and contributes to the solution of problems facing global society through business.

CSR Management

Toshiba Group's CSR

With “CSR management” as the cornerstone of management policy, we proactively promote CSR activities and report the results to our stakeholders, including customers, shareholders, investors, suppliers and employees. We have been signatory to the United Nations Global Compact since 2004, and as a leading global enterprise we uphold its principles of respect for human rights, labor standards, the environment and anti-corruption in all of our activities.



Social Contribution Activities

Our social contribution activities are inspired by the Toshiba Group slogan “Committed to People, Committed to the Future” and rooted in the communities in which we work. Our group companies across the region carry on this commitment by organizing various CSR activities



Donation & outing with Children & Youths (Singapore)



Plantation of Vetiver Grass (Thailand)



Cleaning up activity (Vietnam)

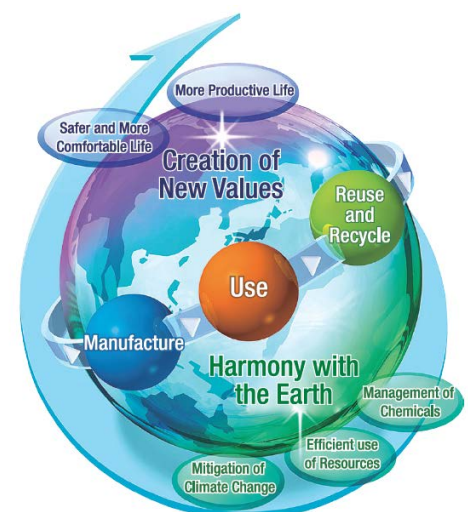


Christmas packages to poor families (Philippines)

Environmental Management

In “Environmental Vision 2050,” Toshiba Group envisages a mid-century world where people lead affluent lifestyles in harmony with the earth. In working to realize that vision, Toshiba Group has set itself the long-term goal of increasing eco-efficiency in FY2050 to 10 times the FY2000 level.

Eco-efficiency can be expressed as a fraction, with value as the numerator and environmental impacts as the denominator. It can be improved significantly by simultaneously increasing added value while decreasing environmental impacts. Toshiba’s ultimate objective is to contribute to realizing a sustainable society, and towards this we are accelerating initiatives in three areas: reduce environmental impacts in manufacturing processes; improve the environmental performance of products and services; and reinforce the foundations of environmental management, such as compliance, human resource development, and communications



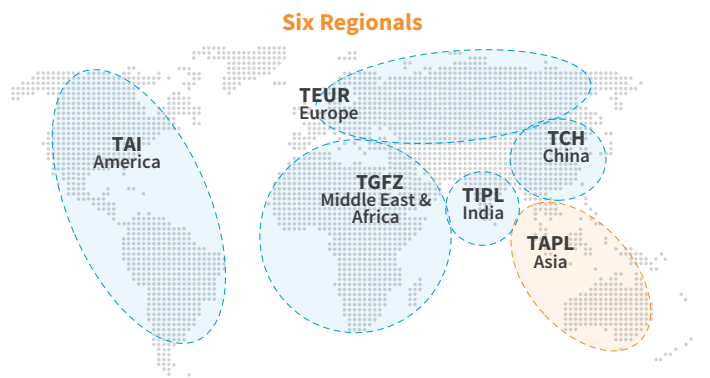
Toshiba Asia Pacific Profile

Regional Headquarter

Company Name	TOSHIBA ASIA PACIFIC PTE. LTD.
Established	May 1995
Shareholder	100% Toshiba Corporation
Managing Director	Mr. Ryuji Maruyuma

Company Overview

Toshiba Asia Pacific Pte. Ltd. (TAPL), a subsidiary of Toshiba Corporation, was established in 1995 as Toshiba's regional headquarters for operations in Southeast Asia, India, Korea and Oceania.



TAPL's main responsibility is to support Toshiba group companies in these region operating in the areas of social infrastructure systems, power systems, industrial systems, industrial ICT solution, building solutions as well as corporate activities.

List of Subsidiaries in APAC Region

India (9)

- Toshiba India Private Ltd.
- Toshiba JSW Power Systems Pvt., Ltd
- TPSC (India) Private Limited
- Toshiba Transmission & Distribution Systems (India) Pvt. Ltd.
- Toshiba Water Solutions Pvt. Limited
- Toshiba Carrier Air-Conditioning India Pvt. Ltd.
- Toshiba Johnson Elevators (India) Pvt. Ltd.
- Toshiba Software (India) Pvt. Ltd
- Toshiba Logistics India Private Ltd.

Bangladesh (1)

- Toshiba Asia Pacific Pte Ltd - Bangladesh Liaison Office

Thailand (13)

- Toshiba Asia Pacific (Thailand) Co., Ltd.
- TOSPLANT Engineering (Thailand) Co., Ltd.
- TPSC - Thailand Co., Ltd.
- Siam Elevator & Escalator Co., Ltd
- Toshiba Carrier (Thailand) Co., Ltd
- Toshiba Lighting Components (Thailand) Ltd
- TCFG Compressor (Thailand) Co., Ltd
- Toshiba Semiconductor (Thailand) Co., Ltd
- Toshiba Electronics Service (Thailand) Co., Ltd.
- Toshiba Hokuto Electronic Devices (Thailand) Co., Ltd
- Toshiba Tec (Thailand) Co., Ltd
- Toshiba Logistics (Thailand) Co., Ltd
- TL Service (Thailand) Co., Ltd

Indonesia (4)

- PT. Toshiba Asia Pacific Indonesia
- PT. Tosplant Engineering Indonesia
- PT. Envitech Perkasa
- PT. Tec Indonesia

Singapore (6)

- Toshiba Asia Pacific Pte Ltd
- Toshiba Electronics Asia (Singapore) Pte Ltd
- Chevalier Singapore Holdings Pte. Ltd.
- Toshiba TEC Singapore Pte Ltd
- Toshiba Singapore Pte Ltd
- Toshiba Logistics (Singapore) Pte. Ltd.

Philippines (5)

- Toshiba (Philippines), Inc
- TPSC Philippines Corporation
- Toshiba Information Equipment (Philippines), Inc
- Toshiba Logistic Philippines Corporation
- TL Forwarding Service (Philippines) Corporation

Vietnam (9)

- Toshiba Asia Pacific Pte Ltd
- Hanoi Representative office
- Ho Chi Minh City Representative Office
- Toshiba Transmission & Distribution Systems (Vietnam) Ltd
- Toshiba Industrial Products Asia Co., Ltd
- Toshiba Elevator (Vietnam) Limited Liability Company
- TPSC (Vietnam) Co., Ltd.
- Toshiba Software Development (Vietnam) Co., Ltd
- Nishishiba Vietnam Co., Ltd.
- Toshiba Logistics Vietnam Co. Ltd.

Malaysia (10)

- TOS Energy Malaysia Sdn Bhd
- TPSC Engineering (Malaysia) Sdn. Bhd.
- Toshiba Transmission & Distribution Systems Asia Sdn. Bhd.
- M S Elevators Sdn. Bhd.
- M S Elevators Engineering Sdn. Bhd.
- TELC Engineering Center (Malaysia) Sdn. Bhd.
- Toshiba Electronics Trading Malaysia Sdn Bhd
- Toshiba TEC Malaysia Sdn. Bhd.
- Toshiba TEC Malaysia Manufacturing Sdn. Bhd.
- Toshiba Logistics Malaysia Sdn. Bhd.

Korea (3)

- Toshiba Electroncis Korea Corporation
- Toshiba Elevator Korea Inc.
- NuFlare Technology Korea,Inc.

Australia (2)

- Toshiba (Australia) Pty., Ltd
- Toshiba International Corporation Pty., Ltd

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