

Japanese companies building a green revolution

With many countries setting goals to become carbon neutral by 2050, the construction and its related industries will play an instrumental role in reducing CO₂ emissions worldwide. In Japan, companies engaged in the construction, infrastructure and housing industries are leading the way with innovations that will ensure a greener future, developing new energy efficient technologies while also enhancing manufacturing processes to lower the environmental impact of their operations.

"We are working to reduce CO₂ emissions both in the manufacturing stage and in the use of our products. We also aim to become a carbon-neutral company by FY2050, and in the medium term, we are aiming to reduce CO₂ emissions by 50% from FY2013 levels by FY2030," says Hidemitsu Hori, President of YKK AP Inc., a company that is at the forefront of innovation in window manufacturing.

"We are developing windows with excellent thermal insulation

performance. By using windows with high thermal insulation performance, residents can reduce the cost of heating and cooling their homes and contribute to the reduction of CO₂ emissions."

While its products may not be relevant when it comes to lowering CO₂ emissions like those of YKK AP, Yokomori MFG Co., Ltd., a leading manufacturer of steel stairs for industrial, office and residential use, is also playing its part in environmental sustainability by incorporating greener manufacturing practices at its factories both in Japan and abroad, including in China and the U.S.

"We deal with steel materials, so what we focus on is utilizing steel that was made by the electric-arc furnace method," says president and CEO Takeshi Ariake. "This doesn't require the use of raw materials, it recycles already existing steel, making our products more environmentally-friendly, and it is also much cheaper."

Widespread adoption of renewable energy sources will be key

to reaching zero-emissions targets, an area in which Japanese companies like JESCO Holdings Inc. are leading the charge. As a comprehensive engineering enterprise engaged in several segments, including airports, nuclear power and wireless communications, JESCO has also developed several solar power projects in Japan and aims to play a leading role in the proliferation of renewable energy across the Southeast Asian (ASEAN) region.

"We are supporting the move towards a CO₂-emission-free society, through projects to achieve 100% renewable energy utilization and carbon neutrality by 2050," says JESCO chairman and CEO Toshihiro Matsumoto. "When it comes to solar power, it's something that God has granted us and we have no choice, as human beings, but to utilize it."

Kumahira, which develops high-performance security products such as security gates, liquid scanners and safe-deposit boxes, is also looking to expand its international

footprint while growing its global reputation as a green manufacturer. The company hopes to find more international partners to reach its goals. "We are looking for business partners who understand our philosophy of security and who can cooperate with us to expand the business together around the world. We believe that partnership is the key to a better future," explains president Akinobu Kumahira.

Limestone mining is typically an environmentally damaging industry, which is why Yabashi Holdings – a manufacturer of limestone, wood and metal building materials – has incorporated many green practices to offset the environmental impact of its operations, including developing slaked lime, which is used as an air purifier at garbage incineration facilities, and investing in forestry and agricultural activities such as fruit-growing and honey-making. As president Tatsuyoshi Yabashi explains: "Our direction is to focus on making the environment clean through our products in a very efficient and effective manner."

Yabashi Holdings: Committed to carbon offsetting as focus shifts

As it looks to the future, Yabashi Holdings is working towards carbon neutrality and is turning its attention to its wood and metal divisions.



"What's important is to move towards carbon neutrality by planting more greenery and also having an agricultural business."

Tatsuyoshi Yabashi,
President,
Yabashi Holdings Co., Ltd.

Established in 1961, Yabashi Holdings is a leading construction, machinery and mining company present not only in Japan, but across Asia.

The firm is dedicated to *monozukuri*, the spirit of innovation and perfection that underpins Japa-



Yabashi House

nese manufacturing. For President Tatsuyoshi Yabashi, *monozukuri* is about maximizing workers' potential. "It's important to find good human resources and educate and train them in an environment in which they can experience satisfaction and motivation," he says.

Indeed, a devotion to bringing the best out of its employees is central to Yabashi Holdings' "exploring human-kind" philosophy, which places great value on contributing to society as a whole by supporting its individuals.

"Our corporate philosophy states that along with

nurturing human resources to the fullest, making a contribution to society through our business operations is the main mission for our company," explains Mr. Yabashi.

A company whose focus has typically been on limestone mining and processing, Yabashi Holdings is committed to offsetting emissions from this activity. "It's true we're playing a part in environmental degradation by burning limestone, which emits carbon dioxide. So what's important is to move towards carbon neutrality by planting more greenery and also having an agricultural business," Mr. Yabashi says.

Mr. Yabashi also notes that Yabashi Holdings' limestone products



Bespoke Machine

include highly reactive slaked lime, which can be harnessed for a positive environmental impact. Used as an air purifier at waste-burning plants, it can "con-



Limestone

tribute to reducing pollution" – not least in developing countries, which "will be opening more garbage treatment and incineration facilities in future".

Yabashi Holdings also specializes in working with wood and metal, and is now shifting its focus from limestone to these two divisions, particularly metal processing. "Our mid to long-term strategy for the metal business is to focus on our bespoke, custom-made machinery," Mr. Yabashi says. "We believe the originality and uniqueness of a product can be influenced by the very machinery it is made with."



矢橋ホールディングス

www.yabashi.co.jp/holdings/en/

Creating the carbon-neutral windows of the future

Window producer YKK AP understands the pressing need for innovation to drive society towards carbon neutrality, and its energy saving vinyl windows are a great first step.



Triple-glazed vinyl windows

In the race for carbon neutrality, a major emphasis has been placed on the production of clean energy. However, preventing energy loss, and therefore maximizing the efficiency of the energy we use, will be just as key in reaching a carbon neutral world by 2050.

In winter, approximately 50% of a building's heat escapes through its windows, and this heat loss is essentially wasted energy, something window producer YKK AP is seeking to stop with its high-performance vinyl windows. These windows boast high thermal insulation performance that improves living conditions in residential buildings, and YKK AP is developing unique production lines and manufacturing equipment to bring the cost of its vinyl windows down.

These triple-glazed vinyl windows not only make customers' lives more comfortable, but also reduce the cost of heating in homes and help each user lower their carbon footprint.

Understanding the time-consuming nature of renovation, the company has developed a method of window replacement which does not require full-scale removal and can be done in a residential setting in less than half a day.

Meanwhile, manpower shortages and shortened construction periods at construction sites are issues in various countries. To address these issues, YKK AP is working on labor-saving construction and robotization, with the company undertaking a joint research project with Carnegie Mellon University to develop new

"Using windows with high thermal insulation performance can reduce the cost of heating and contribute to the reduction of CO₂ emissions."

Hidemitsu Hori,
President & Representative
Director, YKK AP Inc.



Residential window in China



Panoramic view of the Passive Town

construction technologies using state-of-the-art robots and IT.

As president Hidemitsu Hori says: "We aim to become a carbon-neutral company by 2050, and we are working to reduce CO₂ emissions both at the manufacturing stage and in the use of our products."

As well as its high-performance vinyl windows, YKK AP is also seeking to improve the sustainable credentials of its other products.

The company is using an increased amount of recycled aluminum in its windows and is moving away from energy sources which emit CO₂ to sustainable alternatives in its manufacturing process.



Thermal Insulation Windows System



Unit Curtainwall

Businesses around the world are realizing that innovation must be the driving force behind a new era of sustainability, and this is particularly true of YKK Group, YKK AP's parent company. The Group's award-winning Passive Town project in Toyama Prefecture is an example of this, harnessing natural energy sources such as ground water and sunlight, whilst incorporating high-performance construction to maximize the sustainability of the project.

"This project also has a demonstration aspect to it, and after construction we are taking various measurements and conducting experiments and surveys, including on how people live," Mr. Hori explains.

YKK AP's innovation has also seen it develop a smart door which uses AI and the Internet of Things to scan the user's face, something especially useful for wheelchair

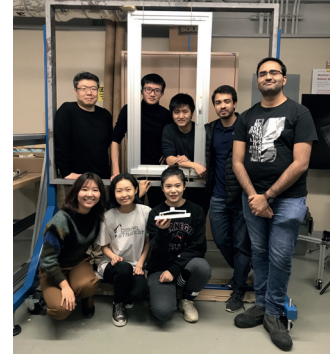


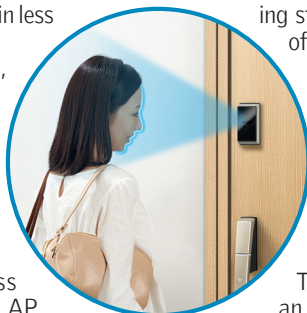
Photo of joint research with CMU (Carnegie Mellon University)

and stroller users. The company also recognizes the importance of data in pushing construction forward and is working to ensure it can provide as much BIM (Build Information Modeling) data for architectural firms as possible.

Mr. Hori understands the needs of the domestic market when making the transition to carbon neutrality, explaining: "Products that are excessively expensive or suspiciously cheap will not sell, as middle-class wages are the most common income level found in the Japanese labor market."

YKK AP is always looking for co-creation partners with this kind of insight into local markets to expand its global operations. With acquisitions carried out in Canada and India, the company has successfully moved into international markets, and is seeking to continue this development through partnerships in the USA, China, and India primarily. It understands the need for price competitiveness in these markets, and its R&D center in Germany is always looking for innovative solutions to bring costs down. Carbon neutrality is an ambitious target, but helping homeowners keep their heat locked inside is a great place to start.

**YKK
ap**
www.ykkap.co.jp



Smart Door equipped
with face recognition
functions

JESCO: Creating an affluent society where people can live with peace of mind

Founded 50 years ago, the JESCO Group (JESCO) is a comprehensive engineering enterprise engaged in nuclear power plant leak testing, construction for solar power plants, and electrical wireless communication equipment, providing a one-stop service from consulting, design, and procurement, to construction and maintenance.



Toshihiro Matsumoto,
Chairman and CEO,
JESCO Holdings, Inc.

Having cemented its reputation in Japan, JESCO continues to expand in the fast-growing ASEAN region, where it has been involved in a number of important projects, including Tan Son Nhat International Airport, Noi Bai Airport in Hanoi (Vietnam) and Bandaranaike International Airport (Sri Lanka).

JESCO has garnered much experience in disaster prevention technologies in Japan and

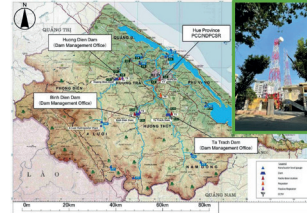


Mega solar panels in Japan, 18.2MW supports Asian countries facing increasing natural disasters, through projects such as the Hue Project for Emergency Reservoir Operation in Vietnam. Meanwhile, the company also aims to support the shift to a carbon-neutral world through its long-standing expertise and achievements in solar projects.

JESCO owns 16.7 hectares of protected forest close to the town of Nachi-Katsuura in Japan's Wakayama Prefecture and is working to reduce CO2 and secure resources. The company continues to expand its ownership of pro-

tected forests such as in Yoshino, Nara Prefecture, as part of its efforts to promote sustainability.

Collaboration has been key to JESCO's success, which is why



Hue Project for Emergency Reservoir Operation

CEO and founder, Toshihiro Matsumoto, is seeking partners to develop more solar projects moving forward. "We have already had contact with 50 companies, but I would like to bring in many more partners for solar energy projects," he explains.



Noi Bai International Airport in Hanoi, Vietnam

"Our advantage is that we're not such a huge company. This is why we want to partner with local companies; we want to get several companies of our size to become a group that can produce great results together. We also want to continue contributing to the construction of international airports in the ASEAN region, as well as disaster prevention and renewable energy-related facilities."



Wood construction material leader sets ambitious sustainability targets

Koshii & Co., Ltd., a wood engineering company, specializes in the production of wooden materials while working on achieving the 17 UN Sustainable Development Goals (SDGs).



"We provide interior panels to international clients and they believe in us; we keep our promise to always deliver high-quality products."

Jun Koshii,
President & CEO,
Koshii & Co., Ltd.

A construction materials company may not be the first thing that comes to mind when we think of achieving the UN Sustainable Development



ZOZO, Inc. ZOZO Head Office

Goals (SDGs), but Japan's Koshii is helping to buck this trend with its high-performance, environmentally friendly wood products.

For over 70 years, the company has been supplying its customers with highly reliable wood products, from paneling to foundations, using the latest technology and techniques to ensure quality. President Jun Koshii explains the key to this longevity has been the company's focus on "cost, quality and delivery."

However, the president understands sustainability must be integrated into every aspect of its op-

erations if Koshii is to both continue growing and have a positive social impact. The company is committed to helping to achieve all of the UN SDGs, not just a select few, and through its focus on sustainable domestic lumber, Koshii now has company-owned forests across Japan, and recycles all of its sawdust for compost.

As Mr. Koshii says: "I think most companies are trying the same but perhaps only for five or six goals. We are different, we aim to achieve all 17 SDGs."



Koshii evening meeting

The reliability of Koshii's products, especially its thermo wood products, has enabled it to expand



Roller coaster with preserved wood

into China and the USA. The company has provided durable materials for projects as varied as the iconic New York subway to the headquarters of fashion website ZOZO, showing the future of construction is based on two principles: reliability and sustainability.



www.koshii.co.jp

Stepping up – Yokomori's stairway to success



"Our flexibility stems from the close relationships we have developed with our clients over the years."

Takeshi Ariake,
President & CEO,
YOKOMORI MFG. CO., LTD.

Since Yokomori MFG. Co., Ltd. took their first steps as kaidan-ya (stair makers) over half a century ago, they have continually assessed the market with the aim of providing safer and higher-quality staircases. As a partner subcontractor to large construction firms, the company's products include internal and external staircases, ornamental stairways, and SYSTAIR, which are customizable residential units.



Roppongi Hills Grand Hyatt Tokyo

"We owe the flexibility and the capacity we have to the extensive knowledge and experience we've acquired through working with multiple clients, especially the experience we have obtained through producing skyscraper staircases, which we're now effectively applying to the residential market," says Takeshi Ariake, President & CEO of Yokomori.

For the past 70 years, Yokomori has been helping Japan's construction industry reach the next level.



Japan House London

"In the past, a majority of the market share had been taken by our competitor in the residential field, however, it has been shifting towards our company lately. This is know-how that we have cultivated through our experiences from developing stairs for the commercial sector, which we have been able to apply to residential use in terms of design, manufacturing and installation. That has led to a high level of customer satisfaction."

When it comes to catering to changing societal and industrial needs, the adoption and innovation of new technology is often the best solution – and this is where the company's computer-integrated manufacturing (CIM) system to streamline the drawing, ordering, manufacturing and delivery of its staircases will be useful going forward.

"We have developed our in-house Intergraph Computer-Aided Dispatch (I/CAD) system that specializes in the design of the stairs," says Mr. Ariake. "There is also a trend for using Building Information Modeling (BIM). General contractors are now talking to us to incorporate our system and combine it with their own work. Our system has also been highly evaluated by U.S. engineers, which has resulted in recent investments. We hope that our system will contribute and shape the future of the Japanese general construction industry in terms of software management for years to come."

In a bid to strengthen its presence in the overseas market, Yokomori has established factories

and offices in the U.S., Singapore, Malaysia and Shanghai, as well as a partnering company in Vietnam. According to Mr. Ariake, the company has its sights now firmly set on the U.S. market as a main focus for international expansion.

"Back in 2016, we merged with Sentry Steel Inc., a Kentucky based steel structural fabricator, and



Residence Stairs "SYSTAIR"

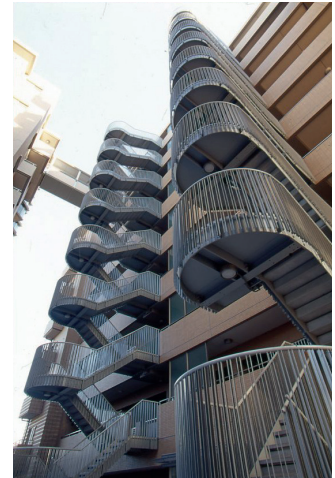
added a brand new factory to its existing facility which is capable of manufacturing 300 units of steel stairs a month," Mr. Ariake explains.

"It is important to station ourselves closer to where the demand is," he adds. "By adding the experience we have acquired in Japan, for example in disaster prevention, to the ability to make proposals that lead to easier stair installation at the worksite, we can provide value-added products to overseas clients."

"In addition, we are also currently trying to establish a footprint in South East Asia. In the future, when there is a rise in demand for factory-made stairs, we could be ready to provide for that demand and be the front-runner in the market."



Steel Staircase for RC-Building



Exterior Stairs "Z55-FRC"



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Towards the foundations of a stable future for Japan and the world

Marutai Doboku, the world's leading steel piling contractor, continues to grow its international reputation thanks to its safe, unique and innovative pile-driving technologies.

Marutai Doboku Co., Ltd. has been constructing the foundations of roads, bridges and harbor structures with steel pipe piles and steel pipe sheet piles (SPSP) for almost 60 years.

Over that time, the company has constantly updated its highly safe, unique and innovative pile driving technologies in response to the demand for larger diameter and longer piles.

Marutai Doboku Co., Ltd., which has solidified its reputation as a frontrunner in foundation work, continues to grow its overseas business division, and has already constructed civil engineering projects in more than 25 countries.

"Japanese companies today need to increase the proportion of overseas business to one-third of overall business to survive and keep growing. That's why we've been doing works in Bangladesh,



"Based on the lessons learned from the Great East Japan Earthquake, we've been building strong pile foundations carefully in case of another large earthquake or tsunami."

Iwao Umeda, Chairman,
Marutai Doboku Co., Ltd.



Côte d'Ivoire and Uganda, and have grown our overseas projects to a value of 3 billion yen (\$27 million). We expect that number to increase up to 7 billion yen in the near future," says chairman, Iwao Umeda.



Marutai Doboku Co., Ltd. provides safe and stable foundation work even under complicated ground conditions and harsh natural circumstances through its large quantity of machinery and high technical strength.



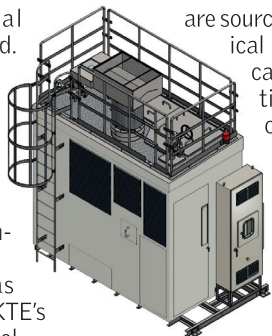
MARUTAI
marutaidoboku.co.jp/english

Highly efficient heat energy sources today for the carbon-free future of tomorrow

For over 120 years, Kawasaki Thermal Engineering has been on the boil in providing world firsts when it comes to package boilers and absorption chillers.

Kawasaki Thermal Engineering Co., Ltd. (KTE) is proud to have launched the WILLHEAT series of compact once-through boilers, equipped with low-NOx hydrogen combustion dry burners.

This product was developed based on KTE's experience and technologies in the manufacturing of boilers that use hydrogen byproducts, which



Hydrogen-fired Multi tube once-through boiler

are sourced from petrochemical plants, steelworks, caustic soda production operations and other such facilities and processes, as fuel. Development also took advantage of Kawasaki Heavy Industries' knowledge in hydrogen-related fields. For these latest boilers, KTE developed a new type of burner fueled by hydrogen, which is a highly promising, environmentally friendly, next-generation energy source.

Hydrogen is a clean energy source that emits no CO₂ during combustion, but due to its high burning temperature it produces roughly three times the NOx emissions of natural gas fuel. KTE's new products

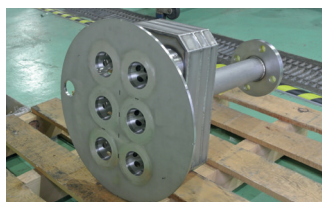
use dry burners, which do not require NOx-reduction measures seen in standard-type burner combustion chambers such as steam-spraying systems and exhaust-gas recirculation.



Susumu Shinohara,
President, KTE

Features

- NOx emissions are kept at 60 ppm or less (at 0% O₂) based on the low-air-ratio standards specified in the Energy Saving Act
- Rated boiler efficiency of 98%
- PID continuous control is applied for feed water to control the steam-water separator's water level, which facilitates stable water levels, and this used in conjunction with the separator's rotation function achieves a high level of steam dryness (99.8%)



Low-NOx hydrogen combustion dry burner



Kawasaki Thermal Engineering

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Related links: https://www.khi.co.jp/corp/kte/product/boiler/hydrogen_en/

For over a century, Kumahira has been evolving while protecting your valuables

Kumahira has expanded into a leading security company, providing Japanese-quality "Anzen and Anshin" to the world.

Trust is the cornerstone to success in the security industry, and Japan's Kumahira has been providing its customers with "Anzen (safety) and Anshin (peace of mind)" through its high-performance security products for over 120 years.



Fully-Automated Safe Deposit Box (Inside)

From its initial focus on vaults and safes, Kumahira has expanded its mission to protect society through its wide range of security products, including fully-automated safe deposit systems, security gates, and liquid scanners, to meet the needs of the times.

Kumahira's fully-automated safe deposit system is not only secure and fire-resistant, but also has features to protect against various natural disasters, and is able to protect customer's valuables. Compared to manual safe deposit boxes, the advantages are that a customer's privacy can be protected because it is not necessary for a bank clerk



"We are always in constant pursuit of new ideas. Ideas are an engine that moves people and businesses."

Akinobu Kumahira,
President and Representative
Director,
KUMAHIRA CO., LTD.



Security Gate UG



Liquid Scanner (LSR-M2)

to enter the safe deposit room with the client. That practicality is greatly increased because the customer can use the rental box while in a private booth.

Kumahira has various security gates developed with an uncompromising approach to functionality and design. These security gates can control each passage one by one and block unauthorized passage, including cases where intruders attempt tailgating. Furthermore, not only do the company's gates function at a high level, but their designs can har-

monize with any entrance space. Kumahira's customers can choose the most suitable gate from an extensive line-up of 16 models.

These days, terrorists are not only targeting specific prominent people but also crowds and unspecified soft targets. As the importance of baggage inspection increases in various facilities where people gather, Kumahira's liquid scanner can detect dangerous liquids such as liquid explosives, allowing for reliable and smooth security checks.

Kumahira has an eye on entering new global markets as it adapts to changing customer



Key Management System (PKS) needs. With over a century spent developing the trust of its customers, the company is looking to spread this trust globally through innovative business ideas.

Kumahira
www.kumahira-safe.com

Kumahira's vault doors are made from its special defense material, Kumahira Alloy.

