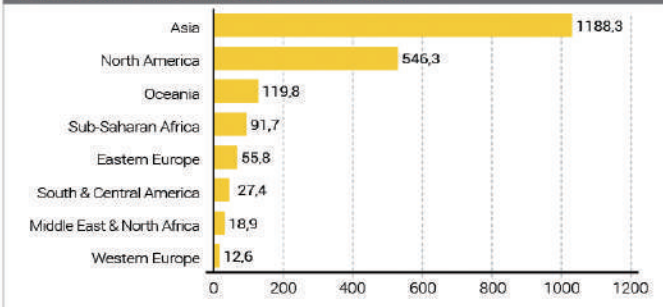


The race to build the world

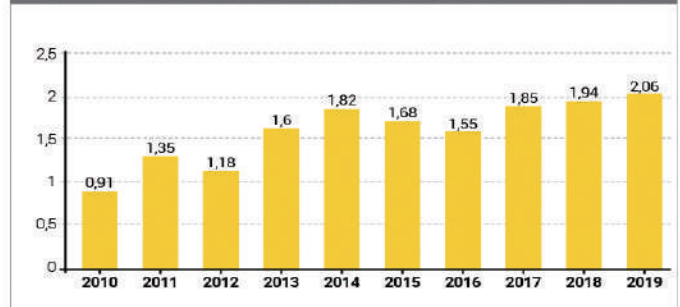
Leveraging on their technology, expertise and experience in delivering high-quality infrastructure projects and machinery, Japanese companies are set to play a major role in infrastructure drives in Asia, the United States and beyond over the coming years.

Value of overseas construction contracts by companies in Japan in fiscal year 2019, by region (in billion Japanese yen)



Source: Overseas Construction Association of Japan, Inc.

Value of overseas construction contracts awarded to companies in Japan from fiscal years 2010 to 2019 (in trillion Japanese yen)



Source: Statista 2021

What do Australia's Olympic Stadium and Singapore's Jewel Changui airport have in common? As surprising as it may seem, the answer is that the leading contractor in both construction projects was Japanese.

From a Shinkansen railway system boasting zero passenger fatalities in fifty years of operation to the world's longest suspension bridge connecting Awaji Island to Kobe, Japan is

recognized as an undisputed leader in infrastructure. Since the country's first construction boom prior to hosting the 64' Olympics, Nippon enterprises have been admired not only for their ability to build engineering marvels, but for their capacity to do so in one of the world's most inhospitable environments, marked by tectonic activity and mountainous regions. It is therefore no surprise to

find that since 1990, the 'land of the rising sun' has consistently ranked amongst the Top 5 in the WEF's 'quality of infrastructure' assessment.

Today, the Japanese construction market has matured. With the oldest population in the world, Japan's demographic line has been sharply declining since 2011, which has lowered the amount of new projects. The Japanese market is currently sustained by the rising need for maintenance and repair of aging infrastructure, and by certain mega redevelopment projects, such as the new Chuo Shinkansen Maglev or the preparations for the Olympic Games.

Japan's international push

Aware of the market's maturity, the country's private and public institutions have engaged in an aggressive campaign to expand overseas, a move which has been aptly timed. In spite of the coronavirus pandemic, the global construction industry is projected to grow by nearly 35% up to 2030, with the bulk of that growth predicted to stem from Asia. Driven by rapid economic and demographic changes and by reforms that facilitate PPPs, the value of mega projects (those worth more than \$25 million) in the ASEAN region alone stands at an incredible \$29 trillion. Since 2000, Japan has financed more than \$230 billion worth of projects in the region, more than any other country thus far.

On the other side of the world, President Joe Biden recently outlined an ambitious \$2 trillion infrastructure plan which has, at its core, the promise to "fix 20,000 miles of American roads". Attracted by the potential of these projects, Sakai Heavy Industries, a leading Japanese manufacturer of road construction machinery with a long-established presence in both regions, has strengthened its technological edge and international presence.

"One reason we have been so successful across Asia is because of the durability and reliability of our rollers. With our brand and quality recognition, we now see growth selling new machines as additional areas have become more prosperous. Though Asia is our primary market, we have seen our business grow across North, Central and South America, the Middle East and Africa," explains president, Ichiro Sakai.

"We offer a number of asphalt and soil compaction machines in the United States, so we are very optimistic about these future projects [under Biden's plan]. We developed a unique series of oscillatory rollers for highway, airport and bridge pavement projects. We offer asphalt rollers for all sizes of construction projects, including residential, commercial, and Interstate highway paving. We have put a lot of emphasis recently into the US market, where we promote our simple-yet-durable designs and superior reliability when compared to the competition there."

Massive roads rollout in the US and Asia

In the Asia-Pacific region, the increased need for connectivity has pushed road-related construction projects beyond the \$1 trillion mark.

Sakai's competitive edge also stems from its technologies that improve the compaction capabilities of its rollers, which ultimately leads to the building of better roads. One of the company's latest developments

Roads must be built. Worlds must be connected.

SAKAI
MASTERS OF COMPACTION

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Kotaro Hirano, President, Hitachi Construction Machinery

is the intelligent Compaction Control system with the CCV stiffness sensor for digital mapping and data gathering for soil and hot mix asphalt.

The company has also pioneered state-of-the-art autonomous rollers. Its reputed vibratory pneumatic tire rollers and high-frequency vibratory rollers were used in the paving of San Francisco International Airport. "In the US, contractors are working hard to continue to improve roadway lifespan by achieving higher density levels," adds Mr. Sakai. "Our business is really about providing the best machinery to these contractors in order to build the best roads possible."

Like Sakai, Hitachi Construction Machinery (HCM) has a prominent presence in the US and Asia, where its reputation for high-quality and industry-leading technology has set it apart from competitors. For HCM president Kotaro Hirano, the



Ichiro Sakai, President, Sakai Heavy Industries, Ltd.

reputed 'Made in Japan' brand gives Japanese construction machinery manufacturers an edge over competitors.

"One characteristic of the Japanese industry is that the whole supply chain has high standards, and those standards are applied across the entire industry. So as a result, the final products show a markedly different level of quality," he explains.

Digital technologies to address disaster prevention

As our world continues to experience environmental changes, the frequency and scale of natural disasters has increased. According to the WEF, 820 natural disasters causing insured losses were experienced in 2019, three times as much as 30 years ago. Strong of their decades of expertise in dealing with geophysical and meteorological disasters, Japa-



Masaru Narita, President, OYO Corporation

nese enterprises have developed leading technologies to address, predict and mitigate such events.

With its operations spanning four business segments (Infrastructure Maintenance, Management, and Renovation; Natural Disaster Prevention and Mitigation; Environment; and Natural Resources and Energy), OYO Corporation offers advanced disaster prevention solutions that combine geology and digital technology.

"When maintaining buildings and civil infrastructure, understanding the ground underneath is of paramount importance. Our company's underground surveys are the perfect example of how we are leveraging Industry 4.0 technologies. For example, after our sub-road cavity survey is conducted, we use AI technology to analyse 3D mapping data. Thanks to this method, we can analyse a 1km

parcel of ground in ten minutes," says president, Masaru Narita.

Pioneering digitalization in the industry, OYO boasts one of the largest databases on underground data and geology-related surveys in the world, and aims to digitize this information to make it available in an open ICT platform accessible to other companies and industries. One of the main advantages of using digital 3D modelling to represent this data is that it allows even non-experts to make more sense of it.

"Our technology has been developed from surveys conducted in Japan, one of the most complex geological regions in the world. Beginning our project in such a complex environment has forced us to develop cutting-edge technologies," Mr. Narita explains.

"While at first a challenge, developing geo-technical technologies in such a complicated environment has become one of our competitive advantages; and we believe that we can export our expertise to overseas markets. We are also working with bSI (building SMART International) to create a new international standard so that our technologies in the field of underground surveys can be recognized globally."

Becoming a next-generation developer



Hitoshi Nomura, President and CEO, Tokyo Tatemono Co., Ltd.

Tokyo's real estate sector continues to witness strong and stable growth, offering investors attractive investment yields and stable profit channels. Nevertheless, foreign investment in Tokyo remains comparatively low, which is why the government and other stakeholders have worked to build a more open, transparent and attractive market for overseas investors.

"I think the real estate market is very attractive but as a whole still receives only a small amount of foreign investment," says Hitoshi Nomura, President of Tokyo Tatemono, a leading player in Tokyo's office and condominium segments. "As a developer, we need to embark on very good projects that pique the interest and appetite of foreign investors in Japan."

Tokyo Tatemono is currently engaged in seven large-scale redevelopment projects in the Tokyo area that are scheduled to be completed in 2030, increasing the company's share of office stock from 500,000 to 800,000 sqm.

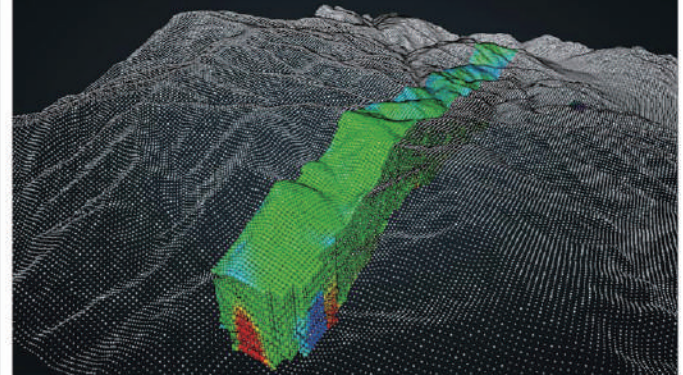
While the pandemic has not affected Tatemono's revenues, it has prompted the company to adopt a new approach to business in line with its "Becoming a Next-Generation Developer" long-term vision. Having launched its office-sharing business "+OURS", the company is also supporting the start-up scene in the capital's Yaesu district under the brand name, "xBridge-Tokyo".

Such initiatives form part of Tokyo Tatemono's efforts to "engage in business with a completely new mentality", says Mr. Nomura. "In doing so, we aim to be reborn as a corporate group that has a 'next-generation' perspective with a flexibility to adapt to any situation."



OYO: the geologist survey-based corporation

Based on its management philosophy and vision, **OYO Corporation** has developed creative technologies such as its i-SENSOR, an electromagnetic device that can 3D map underground utilities and cavities in a matter of minutes, allowing clients to have instant access to critical data. **OYO** serves both Japanese and international clients in four distinct business segments: Infrastructure Maintenance, Management and Renovation; Natural Disaster Prevention and Mitigation; Environment; Natural Resources and Energy.



oyo corporation

www.oyo.co.jp

世界開発競争

これまでの質の高いインフラプロジェクトや、機器の提供を通じて得た技術と専門性と経験を活かし、日本企業は今後アジアや米国をはじめとする世界のインフラ整備に、大きな役割を果たすことになるでしょう。

左グラフ： 2019 年度日本企業による海外工事請負金額（地域別）（単位：億円）

右グラフ： 2010 年度～2019 年度 日本企業が受注した海外工事の金額（単位：兆円）

オーストラリアのオリンピックスタジアムとシンガポールのジュエルチャンギ空港の共通点とは何でしょうか？ 意外に思われるかもしれませんが、その答えは、2つの建設プロジェクトの主要建設業者が日本の会社だということです。

開業以来 50 年間、乗客の死亡事故ゼロを誇る新幹線や、淡路島と神戸を結ぶ世界最長の吊り橋など、日本は言わずと知れたインフラの先進国です。1964 年のオリンピック開催に向けた日本初の建設ブーム以来、日本企業はその驚異的なエンジニアリング工学力だけでなく、地震・火山活動や国土の多くが山岳地帯という世界で最も過酷な環境の中で仕事を遂行できる力を高く評価されてきました。それ故に、1990 年以降「日出ずる国」が WEF の「インフラ品質」の評価で常にトップ 5 に入っていることに驚きはありません。

今日の日本の建設市場は既に成熟しています。世界で最も高齢化が進んだ日本は、2011 年以降急激に人口が減少し、それに伴い新規プロジェクトが減少して来ました。足下の日本の建設市場は、老朽化したインフラの保守と補修ニーズの高まりや、中央新幹線やオリンピック準備などの大規模な再開発プロジェクトによって支えられている状態にあります。

日本の海外進出

市場の成熟を認識し、官民を挙げて積極的な海外進出キャンペーンが展開されていますが、これは中々良いタイミングといえます。コロナウイルス感染症の大流行にもかかわらず、世界の建設業界は 2030 年までに 35%近い成長が見込まれ、その大部分はアジアからもたらされるものと予測されています。急速な経済・人口動態の変化や、PPP を推進する改革に後押しされ、ASEAN 地域だけでもメガプロジェクト(2,500 万ドル以上のプロジェクト)の規模は 2 兆 9,000 億ドルという驚異的な数字になっています。2000 年以降、日本は 2,300 億ドル以上の資金をこれらの地域に提供をしており、これは今のところ他のどの国よりも多いものです。

米国・アジアにおける大規模道路建設

アジア太平洋地域では、接続性へのニーズの高まりにより、道路関連の建設プロジェクトが1兆ドルを超えました。もう一方の世界では、ジョー・バイデン大統領が2兆ドル規模の野心的なインフラ計画を発表し、その中心となるのが「2万マイル（32,000 km）の米国道路補修」という公約です。これらのプロジェクトに呼応して、日本の道路建設機械のトップメーカーで、米国およびアジアで長い実績がある酒井重工業は、その技術力と国際的な存在感を高めて来ています。

「アジアで成功している理由の一つは、当社のローラの耐久性と信頼性にあると思います。私たちのブランドと品質への認識の浸透により、新たに繁栄する地域への新車販売も伸びています。アジアは我々のビジネスの軸ですが、北米、中南米、中東、アフリカでもビジネスの成長を目指しています。」と社長の酒井一郎は説明します。「我々は米国市場で数多くのアスファルト及び土工用締固め機械を紹介していますので、（バイデン氏の計画に基づく）今後の将来プロジェクトに大変期待しています。

当社は高速道路、空港、橋梁などの舗装工事向けに独自の水平振動ローラシリーズを開発しています。また、住宅、商業施設、高速道路の舗装など、あらゆる規模の建設プロジェクトに対応するアスファルトローラを提供しています。米国市場には大変力を入れており、シンプル且つ耐久性のあるデザインと、他社には無い優れた信頼性をアピールしています。」

酒井重工業の競争力の源泉は、ローラの締固め能力を向上させる技術にあります。最新の開発成果の一つは、土やアスファルトの転圧管理用マッピングと締固めデータ収集のためのCCVセンサーを備えたインテリジェント締固め管理システム（Compaction Meister）です。更に、同社は最先端の自律走行型ローラ開発の先駆者でもあります。既に定評がある振動タイヤローラや高周波振動ローラは、サンフランシスコ国際空港の舗装工事で使用されました。「米国の施工業者は道路寿命を延ばすために、より高い転圧密度水準の達成を目指し努力し続けています。」と酒井氏は言います。「私たちの仕事は、最高品質の道路を建設するために、最高の施工機械を施工業者に提供することなのです。」

酒井重工業と同様に日立建機（HCM）は、米国やアジアで抜群の存在感を示しており、質の高さと業界をリードする技術で他社との差別化を図っています。HCMの社長の平野耕太郎氏は、日本の建設機械メーカーが競合他社に対して優位性を持つ理由として、「Made in Japan」ブランドを挙げています。

「日本の産業の特徴は、サプライチェーン全体が高い基準を持ち、その基準が産業全体に適用されていることです。その結果、最終製品の品質が格段に違ってきます。」と説明しています。