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2016 Top Markets Report **Building Products and Sustainable Construction**

A Market Assessment Tool for U.S. Exporters

May 2016



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Joanne Littlefair served as the lead author of this report. A special thanks goes to **Gary Stanley**, Director of I&A's Office of Materials Industries, for sharing his broad industry expertise and for his ongoing leadership and support. This report serves as an update to the 2015 report.

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Executive Summary

Buildings matter. Across the globe, governments and market actors recognize the impact buildings have on energy, water and materials use, emissions, occupant safety and productivity. With this comes awareness of the significant contributions buildings can make toward meeting key national policy objectives and commercial goals. Increasing urbanization worldwide heightens the urgency of creating a built environment that is efficient, supportive of occupant wellbeing and productivity, and resilient to natural and man-made risks. As developed countries expand their economic recoveries and industrialization advances in developing markets, the construction sector is expected to show dynamism worldwide over the next decade.

Export Growth Trajectory

These trends create significant global opportunity for U.S. building product manufacturers. This study ranks the 2018 market potential of 75 international markets for U.S. exports of heating, ventilation, air conditioning and refrigeration (HVACR), lighting, plumbing products, wood products, insulation, windows and doors and glass for construction. These seven categories of building products are well positioned to deliver on the goals of sustainable construction. For the purposes of this study, ITA refers to these product categories collectively as the Building Products sector. It comprised a combined U.S. export portfolio worth \$35.2 billion in 2015, which is projected to grow to more than \$39.4 billion in 2018.

Figure 1: 2016 Building Products Top Markets Projections

Sector	U.S. Exports 2015¹		Projected 2018²
HVACR	\$19.3 billion	➔	\$21.5 billion
Lighting	\$3.3 billion	➔	\$3.7 billion
Plumbing Products	\$1.38 billion	➔	\$1.32 billion
Wood Products	\$8.3 billion	➔	\$9.7 billion
Insulation	\$1.05 billion	➔	\$1.2 billion
Windows & Doors	\$817 million	➔	\$857 million
Glass	\$1.05 billion	➔	\$1.07 billion
Total	\$35.2 billion	➔	\$39.4 billion

U.S. Competitiveness and Export Profile

U.S. building products perform well in a global trade environment characterized by fierce competition and often thin margins on sales. Brand recognition is strong for U.S. building product manufacturers, whose products have a reputation for high quality manufacture, performance and durability. Export destination density is high for the combined sector and for each of its seven subsectors. Seventy-two percent of building product exports went to the top 10 markets in 2015, and nearly 60 percent of U.S. exports went to just four markets: Canada, Mexico, China and Japan. These four markets demonstrate U.S. product competitiveness in developed and developing countries, in proximate and distant markets and in duty-free locations as well as those where tariff barriers persist.

In each of the seven subsectors, the U.S. exporter base is comprised of a limited number of large companies and a broad base of small and medium-sized enterprise (SME) manufacturers.

Challenges

In each of the seven subsectors, U.S. exporters report the following key challenges:

- Tariff impacts constrain the foreign import market share of U.S. products;
- Standards and conformity assessment requirements are the most significant non-tariff barriers to trade. Compliance cost burdens may have a disproportionate impact on SME exporters;

- Market-specific actionable intelligence is needed on sales opportunities and sales channels;
- Information is needed on relevant trade promotion opportunities and programs;
- U.S. building products exporters face increased opportunity when green retrofit and new green construction take larger shares of the construction environment.

A wide range of U.S. government trade policy, trade promotion, trade facilitation, export market development and trade remedy tools are relevant to addressing building product sector challenges and are available to U.S. exporters.

Country Case Studies

To elaborate on market conditions, detailed case studies are available for the following markets:

- Australia
- Canada
- Chile
- China
- Gulf Region
 - Bahrain
 - Kuwait
 - Oman
 - Qatar
 - Saudi Arabia
 - United Arab Emirates
- Japan
- Korea
- Mexico
- United Kingdom
- Vietnam

Figure 2: Projected Top 10 Markets by Sector and Subsector (2018)

Overall Building Product Sector	HVACR	Lighting	Plumbing Products	Wood Products	Insulation	Doors & Windows	Glass
Canada	Canada	Canada	Mexico	China	Mexico	Canada	Hong Kong
Mexico	Mexico	Mexico	Canada	Canada	Canada	Mexico	Canada
China	China	China	Saudi Arabia	Mexico	China	Bahamas	Mexico
Japan	Saudi Arabia	Korea	UAE	Japan	UK	Australia	Colombia
UK	Germany	Saudi Arabia	Taiwan	Vietnam	Korea	Saudi Arabia	UAE
Saudi Arabia	UK	Germany	UK	UK	Australia	Russia	South Africa
Germany	Brazil	Japan	Venezuela	Italy	Brazil	UK	Turkey
Australia	Australia	UK	Korea	Turkey	Japan	Japan	Australia
Hong Kong	Japan	Taiwan	Australia	Australia	France	Venezuela	Venezuela
Korea	France	Netherlands	South Africa	Spain	Germany	Netherlands	Kuwait

Overview and Key Findings

Introduction

The trend toward “greener,” more sustainable construction has taken hold in construction markets globally. Governments, private enterprise and consumers around the world increasingly recognize the role buildings play in energy, water, materials and other resource usage; greenhouse gas (GHG) emissions; the safety, health, and productivity of citizens; and the sustainability and resilience of a nation’s built environment. As building-related technologies advance and awareness of their potential benefits grows, many nations now look beyond “greener” buildings. This vision seeks buildings that offer healthier environments, “smart” buildings where efficiencies are maximized through information collection and system-to-system communication, and buildings that provide resilience in the face of natural and man-made risks. Increasing global urbanization is a steady driver fueling these trends. U.S. building products are competitive in construction markets worldwide and in both highly developed and developing economies. U.S. manufacturers have much to offer global markets that recognize how increasing building performance can contribute to public and private sector goals and priorities.

The Building Products Sector

This study ranks 75 international markets in terms of export potential for seven categories of U.S. building products. U.S. products in these categories compete well in global construction markets and have strong potentials to deliver on the goals of increasingly sustainable construction.

This sector includes:

- heating, ventilation, air conditioning and refrigeration (HVACR) equipment;
- lighting;
- plumbing products;
- wood products;
- insulation;
- windows and doors; and
- glass.

U.S. manufacturers across industries contribute to the sustainability, health and resilience of the built environment, and ITA is not defining these seven product categories as green or preferred. Nor is ITA attempting to identify only export market opportunities associated with sustainable construction. The purpose of this study is to identify international markets with the greatest overall opportunity for U.S. building product exports, in which green building and other trends may create additional opportunity for U.S. exporters.

\$39 Billion Export Portfolio (2018)

This sector comprised a U.S. export portfolio worth \$35.2 billion in 2015. It is projected to grow to \$39.4 billion in 2018. U.S. export growth is projected in six of the seven subsectors considered. In the plumbing products sector alone, a slight decline in exports is projected for 2018 compared with 2015 levels. This may reflect the trend in plumbing products manufacturing to address international market opportunities via more proximate or lower cost manufacturing in addition to exporting from the United States.

Figure 3: U.S. Exports (in USD Billions)

	2015	2018 - Projected
HVACR	\$19.30	\$21.50
Lighting	\$3.30	\$3.70
Plumbing Products	\$1.38	\$1.32
Wood Products	\$8.30	\$9.70
Insulation	\$1.05	\$1.20
Doors, Windows	\$0.82	\$0.86
Glass	\$1.05	\$1.07
Total Sector	\$35.20	\$39.40

Global Construction Market Growth

Over the coming decade and beyond, construction is expected to be one of the more dynamic sectors of the world economy. Construction output across the globe is expected to grow 85 percent by 2030, creating a \$15.5 trillion market by that date.³ As developed economies recover from economic downturns and developing economies advance in their industrialization, the rate of worldwide

construction growth, projected at 3.9 percent per year to 2030, outstrips that of projected global GDP growth by more than 1 percent.

The Urbanization Megatrend

More than half of the world's population today lives in urban areas, and nearly all countries across the globe are experiencing increasing urbanization.⁴ This global urbanization megatrend drives demand for both new buildings and reconstruction and retrofit of existing building stock, as cities work to create environments in which increasingly dense populations can thrive. It also drives an imperative to build "greener," more sustainable buildings that conserve energy, water and other resources while supporting occupant safety, health and productivity and adding to the resilience of the built environment.

The trend of increasing sustainable construction across global markets is propelled by government policies, consumer preferences and market forces. This growth trend spans both developed and developing markets and is not limited to any specific regions of the world. It creates strong opportunities for U.S. suppliers of HVACR, lighting, plumbing products, wood products, insulation, windows and doors and glass. U.S. manufacturers of all these product categories enjoy excellent reputations for product diversity, quantity, quality and reliability.

Global Trends Driving Sustainable Construction

Governments and the private sector often pursue more sustainable construction under goals or programmatic themes. Policies and market developments associated with the following objectives and thematic initiatives are intensifying globally, creating opportunities for U.S. building product exporters.

Energy efficiency (ongoing push for increased gains): Fully one-third of the world's energy use is estimated to take place inside buildings,⁵ meaning that increasing building energy efficiency can have enormous impacts on energy demand and greenhouse gas (GHG) emissions. Products from all seven subsectors of this group have the ability to make strong contributions to increasingly energy efficient building performance.

Water efficiency (and its nexus with energy efficiency): Water shortages and drought conditions experienced around the globe underscore the importance of buildings in creating more sustainable environments. Estimated to account for some 20 percent of total water use, buildings have enormous potential to achieve gains. Increasingly, markets demand buildings with water conservation and management strategies, from use of water-efficient fixtures and appliances to separation of uncontaminated graywater for re-use, to rainwater harvesting and storm water management. Increasing water efficiency also can provide concurrent energy efficiency gains.

Resilience: Resilience is a concept receiving considerable attention from governments, banks and investors, international development organizations and private sector construction stakeholders. In the face of natural and man-made risks, the ability to circumvent, withstand, survive and recover from impacts is essential to economic and social vitality. Buildings have a clear role to play in this sphere, creating opportunities for building product exporters. Energy efficient buildings are able to operate longer without external power sources and require less power at full operational levels. Buildings with high quality envelopes (windows and doors, glass, insulation, wood products) and ventilation systems (HVACR) create safer, more comfortable environments in the case of an impact, prolonging consistency of operations. Water conservation and management (plumbing products) likewise create less demand on external systems and extend a building's operational life in the event of an impact.

Net-Zero Energy Buildings (NZEB): The NZEB concept has captured considerable attention globally. Government policies and private initiatives can be seen being geared to designing, building and operating structures in which the total amount of energy used by the building on an annual basis is roughly equal to the amount of renewable energy generated on site. Achieving high energy and water efficiency within the building is needed to minimize demand for energy, which is important to the concept. This creates opportunities for all building product manufacturers.

Intelligent or "smart" buildings: A smart building is generally understood as one reflecting a holistic approach to a building's design, construction and

operation to maximize efficiencies, occupant comfort and other functional priorities. The building is a system of systems that communicate within the building and externally to optimize performance. Smart buildings create immediate opportunity for design services and information and communication technologies. They also create demand for high-quality building products with inherent efficiency and interoperable functionality compatible with smart building design.

Street lighting and smart cities: Smart buildings are recognized key elements of smart cities. Certain subsector building product categories are also often highlighted as essential to smart city performance. One such example is smart LED street and infrastructure lighting. Smart exterior lighting is lauded globally for its contributions to energy efficiency, reduced maintenance requirements, public safety and overall usability of the built environment.

Healthy buildings: Across many building categories, notably among institutional and commercial buildings, there is a focus on increasing building value through a healthy building approach. This places an emphasis on indoor air quality, use of low-toxicity materials, occupant thermal comfort, access to natural light, safe and efficient water use, and materials and system resistance to contamination. All product categories across sector have roles to play in the construction and operation of healthy buildings.

Specific ways in which these themes manifest in key U.S. export markets are explored in the Case Studies section of this report.

Key Findings: Top Markets and Methodology

The building product sector as a combined whole has a high density of export destinations. Fully, 72 percent of building products exports went to the top 10 markets in 2015. A high density of export destinations also characterizes each of the seven subsectors within this group.

For the combined sector, the most recent trade data show over 60 percent of U.S. exports going to four markets: Canada, Mexico, China and Japan. The prominence of these four countries

underscores that U.S. exporters across the sector compete well in:

- markets that are proximate as well as more distant markets, where transport and materials handling costs are a factor;
- markets that are both highly developed and developing; and
- markets in which U.S. free trade agreements enable preferred market access or duty-free import of U.S. products as well as in those where tariff barriers persist.

A complete ranking of projected 2018 export potential for 75 international markets is included in Appendix 2. These building product market rankings provide a broad sense of international markets with the greatest promise across the seven subsectors.

International trade conditions shared across all seven subsectors include:

- a high density of export destination, with the majority of subsector exports destined for the top five markets;
- a U.S. exporter base comprised of a small number of large companies and a broad base of small and medium-sized companies;
- products in which global competition is fierce and sales margins typically are small, meaning that tariffs can have a major impact;
- standards and conformity assessment requirements as the most significant reported non-tariff barriers to trade;
- increased opportunity as green retrofit and new green construction take larger shares of the construction environment; and
- subsectors in which USG trade policy, trade promotion, trade facilitation, export market development and trade remedy tools all are relevant.

Moving beyond these commonalities, review of leading export markets on a combined sector alone is insufficient. A subsector-specific review of top export market rankings is also informative.

Figure 4: Projected Top 10 Markets by Subsector (2018)

	HVACR	Lighting	Plumbing Products	Wood Products	Insulation	Doors & Windows	Glass
1	Canada	Canada	Mexico	China	Mexico	Canada	Hong Kong
2	Mexico	Mexico	Canada	Canada	Canada	Mexico	Canada
3	China	China	Saudi Arabia	Mexico	China	Bahamas	Mexico
4	Saudi Arabia	Korea	UAE	Japan	UK	Australia	Colombia
5	Germany	Saudi Arabia	Taiwan	Vietnam	Korea	Saudi Arabia	UAE
6	UK	Germany	UK	UK	Australia	Russia	South Africa
7	Brazil	Japan	Venezuela	Italy	Brazil	UK	Turkey
8	Australia	UK	Korea	Turkey	Japan	Japan	Australia
9	Japan	Taiwan	Australia	Australia	France	Venezuela	Venezuela
10	France	Netherlands	South Africa	Spain	Germany	Netherlands	Kuwait

Methodology

The *2016 Top Markets Building Products and Sustainable Construction Report* utilizes an analytic approach consistent with the 2015 Top Markets report (“TMR15”). Following its publication, ITA evaluated the effectiveness of the TMR15 projections against reported annual trade data for 2015. This is an imperfect evaluation because 2015 trade data was compared with TMR15 projections, which looked two years ahead of that timeframe, but it represents one method of review. Because a significant percentage of U.S. exports is concentrated in a small number of markets for the building product sector, our evaluation considered the number of TMR15 projected top 10 export markets that were confirmed to be Top 10 markets in 2015 based on actual reported trade data.

The results showed that for the combined sector taken as a whole, nine out of the top 10 markets projected were confirmed to be top 10 markets in the 2015 data. For the individual subsectors, the accuracy of results was as follows: HVACR, nine out of top 10; lighting, eight out of top 10; plumbing, seven out of top 10; wood products, nine out of top 10; insurance, eight out of top 10; windows and doors, seven out of top 10; and glass, six out of top 10.

The 75 markets chosen to be included in the 2016 Top Markets rankings reflect the leading 75 export markets in terms of 2015 value of exports for all subsectors combined together as a sector, based on U.S. dollar volumes of U.S. total exports⁶. Together, these 75 markets accounted for more than 98 percent of building products exports in 2015. A list of the markets is found in Appendix 1.

Data sets created in support of the National Export Initiative (NEI) Building Products Sector Strategy form the analytical basis of this study. Under the NEI, ITA established a data concordance of Harmonized Tariff System (HTS) product categories at the 6-digit HTS level. For the seven building product subsectors considered in this study, a total of 194 product categories within the HTS tariff line schedule were utilized. It is ITA’s assessment that these trade data groupings reflect a reasonable approach to valuing U.S. exports in the seven subsectors. A complete listing of HTS product categories considered for each of the seven subsectors is found in Appendix 4.

Trade data utilizing the HTS do not distinguish end-use or product performance characteristics within a product category (such as whether a product is “green”). For this reason, U.S. Census Bureau data for all products within each subsector were utilized to rank export markets for the subsector as a whole and for all seven subsectors together.

Utilizing five years of U.S. Merchandise Trade total exports data from 2011 to 2015 for all of the 194 HTS product categories, ITA utilized a linear projection to smooth annual growth fluctuations, arriving at a projected 2018 export total for each of the 75 export markets. This was done for each of the seven subsectors, individually, as well as for the sector as a combined whole. The full rankings for the 75 markets on a sector and a subsector-specific basis are found in Appendix 2 and Appendix 3, respectively.

Industry Overview and Competitiveness

This report addresses seven subsectors of building products manufacturing: HVACR equipment, lighting, plumbing products, wood

products, insulation, windows and doors, and glass for use in buildings. Across all seven sectors, U.S. manufacturers are recognized worldwide for high quality products reflecting state-of-the-art manufacturing techniques. The U.S. industry in each subsector features a small number of large, diversified corporations with global footprints along with a large number of small and medium-sized enterprises manufacturing a narrower range of products. U.S. products across the seven categories enjoy strong global brand recognition and compete well in both developed and developing markets.

U.S. products in each of sector categories are well positioned to capitalize on growth opportunities and respond to the following trends that have emerged across key global markets.

HVACR Market Trends

The global HVACR equipment industry is projected to grow at a compound annual growth rate of 5.35 percent between 2015 and 2022. This would result in a HVAC market valued at \$151 billion by the end of that period.⁷ Growth drivers include the following:

- *Government regulations* across the world are aimed at requiring more *energy efficient and environmentally friendly products*. For HVACR, such regulations include approaches such as Minimum Energy Performance (MEP) standards, product labelling requirements and others. Beyond energy efficiency, policymakers seeking to mitigate climate change have focused on the role of refrigerants, assessing ozone depleting potential (ODP), global warming potential (GWP) and/or life cycle climate performance (LCCP) in their approach to regulation.
- *Global demand for new construction and for energy efficient buildings* is amid world population growth and increasing urbanization. HVACR is recognized as a significant contributor to a building's energy requirements and is a natural focal area for achieving reductions.
- *An increased focus on indoor air quality* is a component of building performance. HVACR systems play a well understood role in providing thermal comfort as well as sufficient ventilation and humidity control to

occupants with an increased awareness of health aspects in a building.

- *Increased interest in smart cities* recognizes the ability of HVACR systems to communicate with sensors and other building systems to optimize operational efficiency and occupant comfort.
- *Strong consumer interest in smart technologies and user-friendly controls* is also creating demand for new HVACR products. Innovations, such as smart thermostats and easy-to-use interfaces that offer remote access, are stimulating interest in products featuring these capabilities.

Lighting Market Trends

Industry estimates project a \$122 billion global lighting market by 2025,⁸ reflecting anticipated ongoing strong growth. Lighting is well recognized as an area in which building energy performance may be increased quickly, in both new construction and retrofit projects. Awareness that potential lighting systems can offer value beyond energy efficiency is shaping potential market opportunities for U.S. exporters.

- *Smart, connected, controllable lighting:* Sensors and lighting level adjusters are becoming more advanced and connectable, allowing lighting system components to communicate within the lighting system and also with other devices. Adding smart features to lighting also may create new opportunities in retrofit markets that have already seen strong LED uptake and may be open to further retrofit only when provided new offerings.
- *Lighting systems as data networks:* Increasing interest in the Internet of Things, in part, means that lighting systems are increasingly being seen as potential data transmission networks.
- *Smart LED street lighting as a core element of smart cities:* The movement seeking smart city infrastructure creates a global opportunity for manufacturers of smart exterior lighting, which is increasingly seen as a key component of smart city infrastructure. Such lighting offers not only energy efficiency benefits but also offers increases in public safety and public space usability.

- *Focus on quality, especially LED:* Highly energy efficient LED lighting is well established in the global marketplace, and adopters are beginning to signal awareness of quality and performance differences among LED products.
- *Bio-dynamic aspects of lighting:* Lighting can play a key role when occupants' sense of wellbeing, comfort, productivity and ability to learn are under consideration. This is increasingly a factor in schools, hospitals, government buildings and workplaces, among other building segments.

Plumbing Products Market Trends

Global demand for plumbing fixtures and fittings is expected to grow at a rate of 5.3 percent annually through 2018, creating a \$70 billion market worldwide. The Asia-Pacific region is expected to account for the largest share of growth globally while the residential sector is expected to outpace non-residential applications.⁹ The following trends are among the key drivers of market demand:

- *Increased focus on water conservation and efficiency:* The challenge of water shortage is being experienced worldwide in developed and developing countries alike.
- *Water efficiency and energy efficiency link:* Awareness has increased around the world of the connections between water and energy efficiency, adding resonance to calls to conserve and manage water efficiently.
- *Increased focus on public health aspects of water management:* As populations grow and urbanization increases, so too does pressure on insufficient water systems in terms of water supply and water safety. This is particularly a factor in developing markets, with respect to entire systems. In advanced markets, sanitation and hygiene are increasingly important factors, leading to demand for products designed for self-cleaning or more efficient and effective cleaning and reduced human contact (touchless or tap-on/tap-off).
- *Aging populations and accessibility:* Increases in life expectancies around the world signal enduring elderly populations with accessibility preferences and requirements in their homes. Such

requirements are also naturally seen in institutional construction segments.

- *Control technology:* As with many other building product areas, demand is high for integrated plumbing product control technologies. There is also a desire for control technologies that will coordinate plumbing products and other systems, such as lighting, in an integrated interface.

Plumbing products fall into two main categories: finish materials, which come into contact with people (sinks, faucets, toilets, bathtubs, showerheads, etc.) and rough materials, which are used in walls, floors and other piping-related applications. In terms of finish materials, U.S. water conservation standards might not be as stringent as some in the more water-scarce countries. U.S. exporters must closely examine such factors to determine product competitiveness. With respect to rough materials, the United States is one of just three countries using the imperial system of measurement, along with Burma and Liberia. Any U.S. manufacturer of rough materials for plumbing that is seeking to export products must be aware of this factor. For countries using the metric system, it is unrealistic to envision selling rough materials based on the imperial system of measurement for use in projects designed to metric sizes.

While more advanced countries have established plumbing infrastructure and present near-term opportunities, the lower level of plumbing infrastructure in less developed countries presents an opportunity for the U.S. in the longer-term. Collaboration between U.S.-based plumbing code and standard developers and relevant authorities in developing countries creates opportunities for information and resource sharing. Ultimately, this can lead to local solutions being developed based on international best practices and standards. This approach may lead to greater long-term certainty about market potential and market access requirements, benefitting U.S. plumbing product exporters.

Within the sector, the plumbing subsector is notable for how some leading U.S. companies have addressed international market opportunities by establishing manufacturing

facilities overseas in proximate or lower-cost markets.

Wood Products Market Trends

International trade in wood products grew at nearly a 9 percent compound annual growth rate from 2009 to 2014, with world import demand reaching \$111 billion in 2014.¹⁰ U.S. wood products exporters are well positioned to capitalize on two key trends in the global marketplace:

- *Legality requirements:* U.S. timber has been assessed as having an extremely low risk of having been harvested illegally. This may be a strong selling point in the context of globally heightened awareness of the negative impacts of illegal logging, both ecologically and economically. Numerous countries are now engaged in collaborative efforts to combat illegal logging and associated trade. The European Union, Australia and the U.S. have implemented regulatory requirements aimed at halting trade in timber and wood products harvested illegally according to laws in the country of harvest. The EU Timber Regulation and Australia's Illegal Logging Prohibition Act place the burden on their importers to conduct risk assessment of supplies.
- *Green characteristics:* Wood also has a number of environmental and performance benefits that relate to sustainable construction. Wood is well recognized as a renewable resource and a storage medium for carbon dioxide. Wood products lend themselves to reuse, and a building comprised of wood elements is more easily deconstructed. Life cycle assessment (LCA) methods applied to wood showcase applicable performance strengths, including energy efficiency in application.

Insulation Market Trends

The worldwide insulation market is projected to grow at a compound annual growth rate of 8.5 percent through 2020, reaching a global market size of \$67 billion.¹¹ Growth expectations are driven in part by the following factors:

- *Broad awareness of insulation's contribution to energy efficiency benefits:* Properly

insulating a building is recognized as a foundational, cost-effective approach to improving a building's energy performance.

- *Regulatory requirements* around the world increasingly make insulation levels mandatory across building segments.
- *Growth of new construction in developing markets and increases in new construction and re-insulation activity in retrofit projects in developed markets:* With construction entering a new period of dynamism post-recession, new construction is occurring in an environment of heightened awareness of how much insulation offers in potential energy efficiency gains. Owners of existing buildings can conduct cost-benefit assessments, often leading to re-insulation decisions.

Windows and Doors Market Trends

The global window and door industry is forecast to reach \$171 billion by 2018,¹² reflecting a rebound in growth. U.S. manufacturers of windows and doors are well-positioned to capitalize on the key trends affecting markets worldwide.

- *Technological advances are creating dynamism in the subsector.* These include advances related to energy efficiency and strength that can lead to new competitive advantages.
- *New construction and replacement and repair activity is expected to be robust.*
- *Energy efficiency is the key driver.* Strong global interest in increased energy efficiency means high quality products will have the most to offer new build and retrofit projects.
- *Increased interest in passive houses:* Homeowners have shown an increased interest in building practices that include requirements designed to keep indoor temperatures stable with minimal heating and cooling systems. Highly energy efficient windows, in particular, play a key role in this design approach.
- *Daylighting and connection to the outdoors:* The twin objectives of assuring occupants access to natural light and creating a sense of seamless transition between indoor and outdoor environments has led to preference for larger windows and doors with clean sight lines. Daylighting is an important

element of indoor environmental quality and is of considerable interest in schools, healthcare settings and workplaces.

- *Smart windows:* There is increasing interest in windows that change the amount of solar energy (sunlight and heat) transferred based on electronic or environmental controls.

Glass Market Trends

Steadily progressive innovations in glass technology relevant to buildings have transformed the role of glass in the built environment, creating a broader set of functions and applications well suited to green building. These newer glass applications centered on thermal insulation performance and sunlight modulation technologies supplement historically recognized benefits of glass, including aesthetics, durability, safety and sound insulation. The following trends are among the demand growth drivers for glass in construction markets worldwide.

- *Energy performance:* There is worldwide understanding of how glass can contribute to the increased energy performance of buildings. Innovations, such as double-glazed or triple-glazed units with inert gas filling and low-emissivity coatings, have dramatically increased the insulating properties of glass facades and windows. In the face of increased regulatory requirements globally associated with building energy performance, this means more demand for glass solutions. Applications within buildings also are including larger sizes of glass.
- *Applicability to new construction and retrofit:* The energy efficiency improvements glass offers means that building owners can achieve significant gains via retrofit. This increases global opportunity.
- *Dynamic glass:* Dynamically tinted glass for windows, skylights and curtainwalls enables control of the amount of solar energy (sunlight and heat) entering a building at any time. In addition to dramatically lowering building cooling requirements during the hottest times of the day, dynamic glass enables optimization of daylighting and a sense of connection between indoor and outdoor environments. It can reduce costs associated with alternate solar energy

controls (shades or blinds, for example) and can reduce costs associated with replacing sun-damaged interior fittings, such as carpets and upholstery.

- *Smart glass:* Electronically tinted glass can be adjusted manually or automatically via a building automation system. This type of glass is a “smart” application and can be integrated with other building systems, such as HVAC, lighting and security systems.
- *Benefits beyond energy efficiency:* As noted above regarding windows, allowing natural light into buildings and creating a connection are increasingly important elements of green buildings focused on occupant wellbeing and productivity. Glass also is recyclable.
- *Renewable energy potential:* Recent innovations in glass technology have placed the material at the center of renewable energy generation, including solar-thermal and photovoltaic applications.
- *Versatility across climates:* Given the wide array of glazing solutions, glass can be a fit for all climates in which green building is a priority.
- *Security aspects:* Increased focus on safety and security of buildings worldwide creates opportunities for glass with relevant performance characteristics.

Some U.S. manufacturers of glass products for construction use have opted to address international market opportunities via more proximate or lower cost manufacture.

Global Industry Landscape

U.S. building product exporters faced an international market opportunity of \$377 billion in 2015, the total of all non-U.S. import demand for buildings products.¹³ Global trade in all seven subsectors on a combined basis reached \$433 billion in world import demand in 2014. This reflects a five year compound annual growth rate of 7.8 percent from its 2009 level. The United States is the largest world importer of building products. With the United States’ share of world imports removed, the non-U.S. world import demand for building products stood at \$372 billion in 2014.

A review of globally reported import data shows major import markets together with their

respective import market growth rates over the same five year period.

Figure 5: Largest Importers of Building Products

	Importing Country	Imports from World (2014)	Import Market Growth (5-Year CAGR)
1	U.S.	\$60 billion	10.7%
2	China	\$43 billion	14.8%
3	Germany	\$30 billion	7.7%
4	Japan	\$22 billion	7.1%
5	France	\$18 billion	2.1%
6	UK	\$18 billion	8.4%
7	Canada	\$14 billion	7.1%
8	Italy	\$12 billion	1.6%
9	Mexico	\$12 billion	11.3%
10	Korea	\$10 billion	6.0%

To gain the most detailed understanding of global demand for specific product categories, it is valuable to review the data on a subsector-specific basis. The following section examines import demand trends for each of the seven segments of this sector.

HVACR Product International Trade

- U.S. exports are projected to reach \$21.5 billion in 2018, up from \$19.3 billion in 2015
- Global opportunity: world import demand for HVACR (excluding U.S.) reached \$160 billion in 2014
- This reflects a 6.8 percent compound annual growth rate (2009 to 2014)

Figure 6: Largest HVACR Import Markets

	Importing Country	Imports from World (2014)	Import Market Growth (5-Year CAGR)
1	U.S.	\$27 billion	11.5%
2	Germany	\$14 billion	7.2%
3	China	\$14 billion	5.9%
4	Japan	\$8 billion	8.9%
5	Mexico	\$7 billion	13.1%
6	France	\$7 billion	3.2%
7	UK	\$7 billion	6.7%
8	Canada	\$6 billion	7.4%
9	Russia	\$5 billion	15.0%
10	Italy	\$5 billion	1.8%

Lighting Product International Trade

- U.S. exports are projected to reach \$3.7 billion in 2018, up from \$3.3 billion in 2015
- Global opportunity: world import demand (excluding U.S.) for lighting reached \$46 billion in 2014
- This reflects a 7 percent compound annual growth rate (2009 to 2014)

Figure 7: Largest Lighting Import Markets

	Importing Country	Imports from World (2014)	Import Market Growth Rate (5-Year CAGR)
1	U.S.	\$10.8 billion	12.2%
2	Germany	\$5 billion	9.2%
3	France	\$3 billion	2.1%
4	UK	\$2 billion	8.9%
5	China	\$2 billion	-3.1%
6	Canada	\$2 billion	7.7%
7	Mexico	\$1.6 billion	10.5%
8	Netherlands	\$1.6 billion	7.9%
9	Japan	\$1.5 billion	9.1%
10	Italy	\$1.4 billion	5.2%

Plumbing Products International Trade

- U.S. exports are projected to decline slightly to \$1.32 billion in 2018, from \$1.38 billion in 2015
- Global opportunity: world import demand (excluding U.S.) for plumbing products reached \$24 billion in 2014
- This reflects a 5.7 percent compound annual growth rate (2009 to 2014)

Figure 8: Largest Plumbing Product Import Markets

	Importing Country	Imports from World (2014)	Import Market Growth Rate (5-Year CAGR)
1	U.S.	\$3.6 billion	7.1%
2	Germany	\$2.2 billion	8.1%
3	France	\$1.6 billion	3.4%
4	UK	\$1.4 billion	4.7%
5	Italy	\$897 million	1.8%
6	China	\$855 million	1.8%
7	Canada	\$819 million	5.2%
8	Mexico	\$805 million	4.6%
9	Russia	\$779 million	9.2%
10	Japan	\$776 million	12.8%

- Global opportunity: world import demand (excluding U.S.) for insulation reached \$7.3 billion in 2014
- This reflects a 6.4 percent compound annual growth rate (2009 to 2014)

Figure 10: Largest Insulation Import Markets

	Importing Country	Imports from World (2014)	Import Market Growth Rate (5-Year CAGR)
1	U.S.	\$766 million	11.4%
2	Germany	\$618 million	6.5%
3	China	\$571 million	13.5%
4	France	\$488 million	1.7%
5	Canada	\$367 million	9.5%
6	Mexico	\$346 million	16.7%
7	UK	\$286 million	6.5%
8	Italy	\$252 million	1.9%
9	Belgium	\$209 million	1.0%
10	Russia	\$205 million	16.4%
11	Korea	\$196 million	18.3%

Wood Products International Trade

- U.S. exports are projected to reach \$9.7 billion in 2018, up from \$8.3 billion in 2015
- Global opportunity: world import demand (excluding U.S.) for wood products reached \$111 billion in 2014
- This reflects a 8.9 percent compound annual growth rate (2009 to 2014)

Figure 9: Largest Wood Product Import Markets

	Importing Country	Imports from World (2014)	Import Market Growth Rate (5-Year CAGR)
1	China	\$22 billion	26.9%
2	U.S.	\$16 billion	10.6%
3	Japan	\$11 billion	6.0%
4	Germany	\$7 billion	7.9%
5	UK	\$5 billion	14.0%
6	France	\$4 billion	0.5%
7	Italy	\$4 billion	0.2%
8	Canada	\$4 billion	6.7%
9	Netherlands	\$3 billion	3.9%
10	Korea	\$3 billion	8.3%

Doors and Windows International Trade

- U.S. exports are projected to reach \$857 million in 2018, up from \$817 million in 2015
- Global opportunity: world import demand (excluding U.S.) for doors and windows reached \$12.1 billion in 2014
- This reflects a 4.9 percent compound annual growth rate (2009 to 2014)

Figure 11: Largest Door and Window Import Markets

	Importing Country	Imports from World (2014)	Import Market Growth Rate (5-Year CAGR)
1	U.S.	\$2.1 billion	3.9%
2	Germany	\$1.1 billion	11.0%
3	UK	\$926 million	4.1%
4	France	\$874 million	1.1%
5	Japan	\$795 million	3.5%
6	Switzerland	\$735 million	9.0%
7	Canada	\$587 million	6.1%
8	Austria	\$437 million	5.7%
9	Russia	\$428 million	7.0%
10	Denmark	\$415 million	1.5%

Insulation Products International Trade

- U.S. exports are projected to reach \$1.2 billion in 2018, up from \$1.05 billion in 2015

Glass for Construction International Trade

- U.S. exports are projected to increase to \$1.07 billion in 2018, up from \$1.05 billion in 2015
- Global opportunity: world import demand (excluding U.S.) for glass related to construction reached \$12 billion in 2014
- This reflects a 7.9 percent compound annual growth rate (2009 to 2014)

Figure 12: Largest Glass Import Markets

	Importing Country	Imports from World (2014)	Import Market Growth (5-Year CAGR)
1	China	\$2.7 billion	51%
2	Hong Kong	\$1.2 billion	59%
3	Korea	\$878 million	-7.50%
4	U.S.	\$621 million	8.30%
5	Canada	\$465 million	7.10%
6	Germany	\$425 million	-2.90%
7	France	\$386 million	-0.70%
8	Malaysia	\$274 million	8.70%
9	Poland	\$270 million	1.60%
10	Belgium	\$269 million	3.30%

Challenges, Barriers, and Opportunities

ITA is well positioned to assist U.S. companies via the trade promotion, trade policy, trade promotion, trade facilitation and overall market expansion approaches described below.

Challenge: Actionable Intelligence on In-country Sales Channels, Buyers and Influencers

Building products exporters face a global competitive environment, including sophisticated world-leading foreign manufacturers at the higher-end together with lower cost, lower quality producers seeking to claim market share. In this environment, U.S. exporters need both market-level context information as well as subsector-specific intelligence on sales channels, buyers and potential sales influencers.

Sales channels and buyers

In each international market and in each of the seven subsectors, different sales channels and buyer types are of primary and secondary importance to

U.S. exporters. For building products, information on which of the following channels hold the greatest promise for achieving sales enables a company to streamline its market development approach.

- Government entities
- Architects
- Design & build companies
- Trade contractors
- Building facility managers
- Distributors
- Showroom dealers
- Retailers
- Other

Influencers

In addition, in some international markets, there are one or more entities – government or private sector – that can heavily impact the success of a market strategy for U.S. building products exporters. Gaining information about these types of entities will help the exporter set priorities for in-country outreach and relationship development.

U.S. Government Resources

- As a component of trade promotion activities, on a market-specific and subsector-specific basis, ITA staff in a target market may be able to support U.S. exporters with information on key sales channels and influencers in that market.

Challenge: Actionable Intelligence on Sales Opportunities

U.S. exporters consistently have expressed a desire for concrete information about specific sales prospects in a market as early as possible.

U.S. Government Resources

- For information on ITA Global Design and Construction Team resources, please refer to the Resources for U.S. Exporters addendum to this report.
- ITA staff members in foreign markets conduct in-country outreach to subsector-specific sales channels and influencers to develop intelligence on potential sales opportunities. U.S. exporters

may register to receive trade leads at:
<https://www.linkedin.com/groups?home=&gid=4979345&trk=anet Ug hm&goback=%2Egna 4979345>

Challenge: Trade Promotion in Highly Competitive Global Markets

U.S. building product exporters compete with world-leading companies and low-cost producers in every international market. Traditional trade promotion approaches can be employed successfully in the sector's leading markets to put U.S. exporters and their products in direct contact with potential buyers. These approaches include domestic and international trade shows, overseas trade missions and reverse trade missions bringing international buyers to the United States, and direct matchmaking programs that feature tailored market research and buyer introductions, among other services.

U.S. Government Resources

- *Sub-sector specific or green theme events:* Trade promotion activities are most useful when conducted on a subsector-specific basis to enable U.S. suppliers to engage more knowledgeable would-be buyers in discussion of product performance characteristics and technical requirements. Trade events organized around specific themes, such as green building, smart cities or resilient communities, for example, may also provide opportunity to promote a range of building product categories in context of their performance contributions.
- *Public-private partnership models:* For building product exporters, ITA has found the public-private partnership model to be highly successful in developing export markets and closing sales. Under this approach, participating U.S. exporters engage in product promotion in target markets while, as needed, U.S. government agencies bolster this promotion work via tailored government-to-government dialogs. Such public-private partnership models consistently have delivered high returns on investment when considering the value of reported U.S. exports generated to the level of federal investment.

Snapshot: Market Development Cooperator Program

Public-private partnerships under ITA's MDCP program support U.S. building product exporters.

- U.S.-China Build program with Evergreen Building Products Association
- Standards and Codes for Sustainable Construction (Gulf Region) with ASTM International
- Water for Indonesia Now (WIN) program with International Association of Plumbing and Mechanical Officials (IAPMO)
- Japan Market Access Program with Evergreen Building Products Association

Challenge: Tariffs

Leading 2018 export markets for the building products sector include a number of countries with which the U.S. has free trade agreements (FTA). In non-FTA markets, tariffs remain a consistent barrier for all seven subsectors. Escalating tariffs, meaning the tariff rates that increase with the technical sophistication of the product, or the level of processing inherent in the product, are a characteristic of many markets in the sector export landscape.

U.S. Government Resources

- ITA is available to help U.S. companies understand the tariffs their products will be subject to in international markets.
- The U.S. government pursues maximum and shortest phase-in tariff reductions, ideally leading to zero tariffs, for building products in bilateral and multilateral trade agreements. Significant tariff reductions will be achieved when the Trans-Pacific Partnership (TPP) Agreement enters into force. Additional opportunities are being pursued in the Trans-Atlantic Trade and Investment Partnership (TTIP) Agreement and the World Trade Organization (WTO) Environmental Goods Agreement (EGA), now under negotiation.
- The U.S. government monitors and enforces implementation of its existing free trade agreements.

- The [FTA Tariff Tool](#) is a public resource available to assist U.S. exporters in understanding the tariff benefits of free trade agreements.

Challenge: Standards and Conformity Assessment (Non-tariff Market Access) Requirements

U.S. industry reports standards and conformity assessment issues (certification, inspection, sampling, testing and accreditation) as the most significant non-tariff barriers to trade for the building products sector. These types of barriers are burdensome for all exporters, and their inherent cost impacts may create a disproportionate burden for SMEs.

1) *Guidance for U.S. Exporters*

- *Market Intelligence:* As a key component of export market intelligence reports, ITA can provide U.S. exporters with access to subsector-specific information on standards (mandatory and voluntary) and conformity assessment requirements, so companies can best determine paths to compliance and reflect compliance in product marketing.
- *Standards Attachés at U.S. embassies:* ITA has standards attachés posted to U.S. embassies in Beijing, Brussels, Mexico City and Sao Paulo that can assist exporters with standards market access issues and provide early notice of construction and public works activities relevant to the building sector.

2) *U.S. Private Sector Notification of and Engagement in Standards Development Work*

- *U.S. firms are encouraged to engage in international standardization activities.* Participants actively engaged in the standards development process have the greatest impact on a standard, and many developing countries with limited resources rely on international standards rather than creating their own.
- There is significant work under way on sustainability and life cycle issues in standardization organizations, such as the International Organization for Standardization (ISO).
- ITA works with the American National Standards Institute to provide early warning about emerging standards issues and to encourage companies to become involved as a way to preempt possible market access issues.

- U.S. entities can sign up for notifications from National Institute of Standards and Technology (NIST) on standards development in target markets.

3) *Action to Resolve Existing Barriers*

If a U.S. exporter reports a market access barrier specific to standards and conformity assessment requirements, ITA is positioned to take the following actions:

- ITA may determine whether the situation constitutes a violation of the World Trade Organization (WTO) Technical Barriers to Trade (TBT) Agreement or one of our free trade agreements.
- If a potential concern or alleged violation is found, as a first step, ITA may develop an approach to relevant in-country authorities toward resolution, depending on the facts of the situation and working as appropriate with interagency partners. Subsequent steps are determined situationally.
- If no violation is found, ITA encourages the use of a broad range of mechanisms to resolve the issue.

4) *Advocacy Supporting International Standards Use*

- The consistent U.S. government message is that standards for sustainable construction facilitate trade and create certainty in international markets. They ensure that buyers have access to efficient solutions reflecting best consensus expertise and enable product and service providers to offer cutting-edge solutions.

5) *Building Capacity in Target Markets*

- To build capacity in target markets, the U.S. government facilitates *standards-related technical and policymaking information and best practice exchange to encourage business-friendly regulatory environments.* The U.S. government seeks to strengthen good regulatory practices that facilitate trade and investment. Examples include encouraging:
 - transparency about new and revised regulatory requirements;
 - technical dialogues and exchanges to introduce new materials, technologies and non-traditional building systems;

- consultations with the private sector as new regulations are being developed; and
 - clarity about which authorities have leadership responsibility or will implement and enforce regulatory requirements.
- The U.S. government communicates to target market regulators and construction industry players that standards for sustainable construction exist and are available to develop effective solutions to specific local challenges and that they are not only developed by ISO, International Electrotechnical Commission (IEC) and International Telecommunication Union (ITU). The U.S. government creates and leverages opportunities for U.S.-based international standards development organizations and U.S. manufacturers to provide information on their solutions.
 - *Building codes may create opportunities.* In addition to ensuring the safety and health of building occupants, building codes increasingly are being utilized as a regulatory tool to increase building performance.
 - International standards referenced in building codes are important mechanisms for facilitating trade in sustainable construction products and services. The U.S. government seeks to create opportunities for U.S.-based standards and code development organizations to showcase their referenced standards and code approaches.
 - As countries design greener building codes, the U.S. government also seeks to create opportunities to share information on best practices supporting the successful development, implementation, enforcement and evolution of building codes.

6) Utilizing Trade Agreements

- In negotiations of bilateral and multilateral free trade agreements, the U.S. government pursues provisions that reinforce existing commitments under the WTO TBT Agreement and strives for inclusion of next generation commitments above and beyond WTO TBT obligations in areas such

as regulatory cooperation and regulatory coherence.

Challenge: Intellectual Property Rights (IPR) Protection

U.S. exporters have reported instances in some international markets of counterfeit brand labels on building products as well as false performance claims on product labels.

U.S. Government Resources

- Information on U.S. government-created public-access tools and services designed to help SMEs protect and enforce their IPR can be found at the ITA-led website <http://www.STOPfakes.gov>.
- Exporters who need further assistance or who encounter IPR-related problems abroad can contact ITA's Office of Intellectual Property Rights (OIPR) experts for assistance in developing a strategy to address IPR problems. OIPR can also connect exporters to other U.S. government agencies and U.S. embassies around the world to pursue a course of action for resolution of problems.
- Basic information on intellectual property tips for the building products and sustainable construction sector include:
 - U.S. companies in the building products and sustainable construction sector should register their trademarks (brand names, logos, product names) in priority markets, monitor foreign markets for counterfeits and secure their supply chains from counterfeit building materials. Patents, including utility model patents available in some countries, can also be an important tool for maintaining a competitive advantage in innovative building products. Companies should take steps to protect trade secrets through implementing non-disclosure agreements, securing sensitive information and using other means of maintaining confidentiality.

Challenge: Expanding the Green Portion of Construction Markets

For economies in which the U.S. market share is high and where there is a recognized, stable regulatory

regime, U.S. government agencies may seek to focus efforts on helping the target market expand the green segment of its built environment in which U.S. products are highly competitive.

U.S. Government Response Tools

- *Share information and best practices.* U.S. government agencies seek to share information and best practices in areas proven to expand green building. A range of areas might include, for example:
 - best practices in workforce development related to closing green construction capacity gaps;

- models of innovative public or private financing mechanisms for green building; and
- information on how countries are using cutting-edge tools such as Building Information Modeling (BIM) as part of a policy framework to expand green building. (BIM is a 3D, model-based process for planning, design, construction and operation of buildings.)

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Country Case Studies

The following pages include country case studies that summarize U.S. building product export opportunities in selected markets. The markets represent a range of countries to illustrate a variety of points— not the top markets overall.

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Australia

U.S. building products generally enjoy duty-free market access in Australia under the bilateral free trade agreement, and a common language eases the operational environment for U.S. exporters. The world's 12th largest economy boasts a mature green building market, and its per-capita GDP of over 51,000 USD is among the highest in the world. Australians are accustomed to sourcing products internationally, and U.S. building products have strong brand recognition and a reputation for quality. Competition, however, is fierce in the geographically vast market with access to low cost manufacturers in the region.

Overall Rank	HVACR	Lighting	Plumbing Products
8	8	11	9
Wood Products	Insulation	Windows & Doors	Glass
9	6	4	8

Shielded from many effects of the global financial crisis by its booming resources sector, Australia experienced a period of high construction growth from 2004 to 2012. The strength of the Australian Dollar relative to other world currencies during roughly 2009 to 2011 also played a role in facilitating increased Australian imports during this period.

Global commodity price declines, along with a decline in the strength of Australia's currency, mean that overall economic prospects in Australia are tempered looking toward 2018.

Australia Construction Market

Looking forward, construction industry output in Australia is expected to increase at a rate of 4.7 percent annually through 2018,¹⁴ slightly lower than the 5.2 percent rate achieved during 2009 to 2013. Much of the anticipated growth is attributable to government investments in infrastructure improvement and increases in the office building segment due to higher yields on asset prices and better leasing conditions. Low interest rates, a low unemployment rate, and increased investor and consumer confidence also are factors supporting growth. Slowing is expected across residential construction and manufacturing facility construction market segments.

Commitment to Green Building

At 7 to 8 percent of GDP, construction is a key component of Australia's economy. The importance of making the country's building sector more sustainable has been recognized by the public and private sector throughout Australia for decades.

The Australian government seeks to harness the recognized potential of the building sector to address important national priorities of resource conservation and emissions reductions, among other key sustainable development goals. Policies to date have focused mainly on improving the energy efficiency of the building stock and spanning new construction, renovation and retrofit of existing buildings.

In 2009, the Council of Australian Governments launched the 10-year National Strategy on Energy Efficiency¹⁵ to accelerate energy efficiency across all sectors of the economy. With regard to energy efficiency in buildings, the Australian government has relied on three key areas of approach: minimum standards, information disclosure requirements and incentives to utilize new energy savings technologies. The Energy Efficiency in Government Operations (EEGO) Policy¹⁶ focuses on building energy efficiency among its measures to reduce

energy consumption among public sector operations.

The private sector has been an active driver of green building in Australia also. In 2002, the Green Building Council of Australia launched the Green Star voluntary rating system for design and construction of buildings, and this system has seen strong market uptake. Green Star evaluates nine categories of building characteristics (energy, indoor air quality, water, materials, emissions, management, transport, land use and ecology and innovation) to determine an environmental impact score. The system is relied upon across the construction industry as a signature measure of projected building performance.

In addition, the Housing Industry of Australia (HIA), an industry organization, operates the Green Smart accreditation program for builders and designers.

A 2015 survey of construction industry stakeholders in Australia found a strong commitment to green building, reflecting a stable and mature green building industry.¹⁷ Survey responses also indicated:

- The top sectors for expected green building growth in Australia are low-rise residential construction, followed by retrofits of existing buildings and institutional construction.
- Environmental regulations and the desire for healthier neighborhoods are the top triggers for green building in Australia.
- The top challenge to green building in Australia is the perception that green building is not affordable and is intended for high-end projects only.

There are no specific federal government policies to advance smart buildings, smart cities, net-zero energy buildings or healthy buildings in Australia. But advocacy groups focused on these types of projects and initiatives are active in Australia's private sector, and demonstration projects are being built throughout Australia.

Challenges & Barriers to Sector Exports

U.S. building products enjoy strong brand recognition and a reputation for high quality in Australia. The U.S.-Australia Free Trade Agreement (FTA), which has been in force since 2005, has been helpful to building product exporters. U.S. exports

across the seven subsectors have increased dramatically since the FTA went into effect, buoyed also by Australia's overall economic growth and periods in which the nation's currency enjoyed relative strength.

U.S. construction-related service exports, namely design and construction services, have not experienced the Australian market as equally inviting. Local Australian companies dominate the architectural services market, with international services accounting for only 1 to 1.5 percent of domestic demand today.

Trans-Pacific Partnership

Australia is a party to the Trans Pacific Partnership (TPP) Agreement, a free trade agreement among the United States and 11 other countries that, when it enters into force, will provide important market access benefits to U.S. exporters. Information about TPP benefits to U.S. building product exporters and other information on how TPP will make it easier to sell made-in-America products can be found at <http://trade.gov/fta/tpp/industries/building.asp>.

The types of barriers and challenges U.S. building product exporters have reported facing in Australia are noted below.

Regulatory environment

The Building Code of Australia (BCA) requires that products and materials used in building construction comply with a variety of Australian standards. Detailed knowledge of the product standard and conformity assessment process is important to building product exporters. Australia's National Construction Code (NCC), which includes the BCA, is publicly available at <http://www.abcb.gov.au>.

Highly competitive market environment

While the U.S.- Australia FTA and a common language provide important advantages to U.S. exporters, the competitiveness of Australia's commercial environment should not be underestimated. Product prices matter in Australia. The country stands in close proximity to lower-cost Asian producers of building products and has access to global suppliers of the highest-quality building products. While enjoying the tariff elimination benefits of the U.S.-Australia FTA, U.S. suppliers still

must overcome transport costs and deliver on product performance and post-sales service requirements to compete in Australia. Winning sales often requires regular direct engagement with buyers to distinguish specific product performance from competitors. To provide needed sales follow-up support, U.S. exporters are well-served by an in-country presence.

Business customs

While having the English language in common provides enormous benefit, it does not equate to the same business customs and procedures. A capable in-country partner may be needed to help U.S. companies navigate the local markets to understand sales channels, the competitive state of play, applicable regulations and standards, as well as other aspects of the Australian commercial landscape. A key component of an Australia market entry strategy is providing ongoing support to the local partner.

Geographic size and diversity

Market information on Australia is best tailored to specific locations and product categories to be of greatest use. The country is vast geographically. This poses challenges in terms of deciding where trade promotion events will be of greatest impact and how to make such determinations. Australia's sheer size also creates a challenge in terms of finding distributors that cover all of the more relevant areas of the market and in terms of selecting one or more locations to establish a local presence. That said, 80 percent of Australia's population is situated along the country's east coast, in cities like Sydney, Melbourne and Brisbane.

Australian companies emphasize the need for local support and service, and the expectation is that U.S. companies will visit Australia to meet with partners and demonstrate ongoing support.

Know Your Buyer

For building product exports, the importance of specific sales channels and buyer categories varies depending on the target export market. In Australia, ITA experience supporting U.S. building products exporters indicates the following assignment of priority among relevant sales channels:

Figure 13:

<u>Sales Channels</u>	<u>Low</u>	<u>Priority</u>	<u>High</u>
Government entities	X		
Architects			X
Design and build companies		X	
Trade contractors		X	
Building facility managers	X		
Distributors		X	
Showroom dealers	X		
Retailers			X

Opportunities for U.S. Companies

Australia imported \$7.9 billion in HVACR, lighting, plumbing, wood products, insulation, windows and doors and glass from the world in 2014.¹⁸ This reflects an 8.7 percent compound annual growth rate of building products from 2009 to 2014. For this sector as a whole, the United States is the second largest source of Australia's imports after China, with a 10.5 percent import market share. Australia imported \$824 million in building products from the United States in 2014.

Addressing the types of barriers described above may help U.S. exporters improve their share of the Australian market. This section provides a review of the current state of play and competitive landscape, suggesting where there may be the greatest room for growth.

Figure 14: Australia's Import Market

<i>Sector</i>	<i>Imports (2014, USD)</i>	<i>U.S. Rank as Import Source</i>	<i>U.S. Import Market Share</i>
HVACR	\$4.3 bil.	2	14.6%
Lighting	\$1.9 bil.	3	4.8%
Plumbing	\$596 mil.	4	4.9%
Wood products	\$1.6 bil.	5	6.0%
Insulation	\$89 mil.	3	13.2%
Windows & Doors	\$215 mil.	4	5.1%
Glass	\$98 mil.	7	3.9%

HVACR

In 2014, Australia imported \$623 million in HVACR products from the United States. Imports sourced in the United States hold the second largest share of Australia HVACR product import market at 14.6 percent. Australia's imports of HVACR products from the U.S. grew at an 8.3 percent CAGR over the 2009

through 2014 period, factoring in an 11 percent year-on-year decline in 2013 and 2014. The competitive landscape features products from China in the lead position. The U.S. share of the market decreased slightly from 11.6 percent to 10.6 percent from 2009 to 2014.

Top 5 Import Sources and Market Share:

1. China (28.2%)
2. U.S. (10.6%)
3. Italy (8.4%)
4. Thailand (6.6%)
5. Korea (5.4%)

Lighting

In 2014, Australia imported \$48.4 million in lighting products from the United States. The U.S. is Australia's third largest source of lighting products, with a 4.8 percent market share. Australia's imports of lighting products from the U.S. grew at a 6.7 percent CAGR from 2009 to 2014, but they showed a 3.1 percent decline over 2013 and 2014. China claims a resounding 66 percent of Australia's lighting import market, followed by Germany at 5%. The U.S. share of the market decreased from 6% in 2009 to 4.8% in 2014.

Top 5 Import Sources and Market Share:

1. China (65.8%)
2. Germany (4.9%)
3. U.S. (4.8%)
4. Italy (2.5%)
5. UK (2.2%)

Plumbing Products

In 2014, Australia imported 29.3 million USD in plumbing products from the United States. Imports of plumbing products from the U.S. grew at a rate of 6.8 percent from 2009 through 2014. During the same period, U.S. market share declined slightly, from 5.6 to 4.9 percent. Again, it is China that dominates the competitive landscape in this subsector.

Top 5 Import Sources and Market Share:

1. China (54.5%)
2. Korea (7.5%)
3. Germany (5.3%)
4. U.S. (4.9%)
5. Malaysia (3.8%)

Wood Products

In 2014, Australia imported \$96.2 million in wood products from the United States. U.S.-sourced wood products enjoyed a healthy 13.4 percent compound annual growth rate into Australia during 2009 to 2013. U.S. wood products are the fifth largest source of Australia's imports, holding 6.0% import market share. The U.S. share of the market grew from 5.3% to its current level over a 5-year period.

Top 5 Import Sources and Market Share:

1. China (25.0%)
2. New Zealand (19.0%)
3. Indonesia (14.7%)
4. Malaysia (8.4%)
5. U.S. (6.0%)

Insulation

In 2014, Australia imported \$11.8 million in insulation from the United States. The U.S. share of Australia's insulation market decreased considerably during 2009 to 2014, from 26.8 to 13.2 percent. The U.S. is Australia's third largest source of insulation imports.

Top 5 Import Sources and Market Share:

1. China (27.3%)
2. Areas, N.E.S.¹⁹ (15.2%)
3. U.S. (13.2%)
4. Germany (8.4%)
5. Malaysia (5.6%)

Windows and Doors

In 2014, Australia imported \$11 million in windows and doors from the United States. Australia's imports of windows and doors from the U.S. grew at a 7.2 percent compound annual growth rate during 2009 to 2014, and U.S. products held a 5.1 percent share of the country's import market at the end of that period. The U.S. is the country's fourth largest source of subsector imports. U.S. market share is down slightly from 2009, when it stood at 5.8 percent. China dominates Australia's window and door import market, holding a 56 percent share.

Top 5 Import Sources and Market Share:

1. China (56%)
2. Malaysia (9.6%)
3. Indonesia (8.1%)
4. U.S. (5.1%)

5. New Zealand (4.3%)

Glass

In 2014, Australia imported 3.8 million USD in glass for construction from the United States. Imports of glass from the U.S. declined at a rate of -26.3 percent during the 2009 to 2014 period, with U.S. subsector imports dropping from nearly 20 percent of the market at the beginning of the same period to 3.8 percent at the end.

Glass imports from the U.S. now hold the seventh largest share of Australia's glass import market. As in many other areas, China dominates Australia import market for construction glass.

Top 5 Import Sources and Market Share:

1. China (55.1%)
2. Indonesia (13.4%)
3. Areas, N.E.S. (4.6%)
4. United Arab Emirates (4.1%)
5. Thailand (3.9%)

Resources for U.S. Exporters

Please visit www.export.gov/australia for information from U.S. Commercial Service (CS) Australia, including:

- Market research
- Trade events
- Trade leads
- Services available to U.S. companies
- Contact information for CS offices in Australia
- Info on subscribing to regular updates or connecting on social media
- Other information to assist U.S. exporters with Australia export market development

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Canada

Canada is the highest ranked export market for U.S. building product manufacturers due to its proximity, its duty-free status under NAFTA, the relative lack of non-tariff trade barriers and ease of commercial relationship establishment. The country has a large, stable construction market with a robust green building segment driven by market forces and government policies. Commodity price declines and a weak Canadian dollar may impact some near-term opportunities, but the Canada market remains attractive for all seven subsectors.

Overall Rank	HVACR	Lighting	Plumbing Products
1	1	1	2
Wood Products	Insulation	Windows & Doors	Glass
2	2	1	2

Canada ranks in the top five countries globally in terms of construction market output, and its built environment increasingly reflects its broad societal commitment to environmental sustainability. While strong construction growth is not projected for the market through 2018, Canada is an advanced economy with a stable construction environment that welcomes U.S. building products.

Green Building in Canada

Canada has a well-established green building market. Federal, provincial and large city government initiatives mandating increased sustainability in government buildings paved the way, and the past decade has seen Canada's private sector embrace green building. Regulatory requirements in building codes and voluntary rating systems both have had important roles in advancing Canada's green building market.

In the code arena, the federal government in Canada leads the development of model building codes, which then are adopted, modified, and enforced by provincial and territorial governments. The model National Building Code of Canada, National Fire Code, National Plumbing Code, and National Energy Code already embody a number of green elements among them: energy conservation, water conservation, materials conservation, indoor air quality, and others.

A variety of voluntary rating systems also drive Canada's green building market, recognizing varying levels of projected building performance. These

include EnergyStar, GreenGlobes, Leadership in Energy and Environmental Design (LEED) Canada, Building Research Establishment Environmental Assessment Methodology (BREEAM) Canada, Building Owners and Managers Association (BOMA) Building Environmental Standards (BEST) and others.

Trends in Canada's Construction Market

Net-Zero Energy Buildings

The Government of Canada has a strong interest in net-zero energy buildings (NZEB) and seeks widespread adoption of optimized NZEB design and operation concepts by 2030.²⁰ These types of buildings are seen as well suited to Canada's construction practices and climatic conditions. In support of this goal, a coalition of industry and government partners has together formed the Smart Net-Zero Energy Buildings Strategic Network (SNEBSN) to focus on the following priorities:

1. Integrated solar and HVAC systems for buildings;
2. Active building envelope systems and passive solar technologies;
3. Mid- to long-term thermal storage for buildings and communities;
4. Smart building operating strategies; and
5. Technology transfer, design tools and input to national policy.

Healthy Buildings

Canada's private sector has begun embracing the healthy building concept. In 2015, the Canada Green

Building Council (CaGBC) announced it would be working with Green Business Certification Inc. (GBCI) to promote and advance the WELL Building Standard in Canada.²¹ Projects can earn WELL Certification by achieving features in seven categories of building performance – air, water, light, nourishment, fitness, comfort, and mind. Each WELL Feature is designed to address issues that impact the health, comfort or knowledge of occupants through design, operations and behavior.

Smart Buildings and Smart Cities

There is strong municipality interest in intelligent buildings and intelligent communities across Canada. Since 2007, a number of cities across Canada, ranging in size, have received recognition in international forums for their advances in intelligent community development.

Challenges & Barriers to Sector Exports

The advanced development and size of the Canadian construction market, and the established trend toward increasingly sustainable construction in that market, suggests good continuing prospects for U.S. building product exporters. U.S. building product exports are dominant in Canada's import market. They enter duty-free and enjoy excellent brand recognition and a reputation for quality performance and strong product support. Addressing the following types of barriers may help U.S. companies across the sector expand their market share in Canada or enter the market for the first time.

Standards, conformity assessment and labeling

Conformance to the relevant Canadian standard is a requirement for all products shipped to Canada. Building product exporters must be aware of the Canadian standard and make sure to have proof of conformance. For this sector, many product standards are similar to U.S. standards, and products designed to conform to U.S. standards often will also comply with the Canadian standard. The exporter must still have knowledge of the standard, the tests required to prove conformance, and how and by what organization the testing can be done. The full suite of USG tools that can assist exporters with standards and conformance issues is detailed in the Executive Summary and Findings section of this report. Exporters also must be aware of Canadian federal law requirements regarding product labeling.

Exchange rate sensitivity

Canadian buyers are highly price sensitive, and fluctuations in the Canadian-U.S. dollar exchange rate impact the ability of U.S. building product exporters to make sales on what already can be low-margin product segments. Financing available via USG resources may be of assistance in structuring competitive sales offers.

Highly competitive market environment

U.S. sector exporters compete in the Canadian market against leading global manufacturers renowned for product quality and innovation. Winning sales requires regular direct engagement with buyers to distinguish specific product performance vs. competitors. U.S. companies must find ways to differentiate themselves from their global competition, possibly by offering specialized after-sales support or via training of sales agents and distributors, as examples.

To maximize impacts, USG trade promotion events (e.g., trade shows, trade missions, reverse trade missions and technical exchanges) should be undertaken on a subsector-specific basis to ensure focused engagement with potential buyers and specific discussion of a product's performance attributes in areas such as energy and water savings. For wood product exporters, this includes sharing fundamental information about wood's green properties and relevance to sustainable construction, including Life Cycle Assessment (LCA) impacts and other sustainability data.

Geographic size and diversity

Commodity price declines are expected to have varying impact on construction markets in different regions across Canada. This is one example of the need for U.S. companies to determine how to best devote time and market development resources. Similarly, there may be important geographic distinctions in the types of building projects with greatest opportunity, among other factors. Market information is best tailored to specific locations and product types to be of real use. Specific types of opportunity leads are needed.

Doing business in Canada

As accessible as Canada is to U.S. companies, doing business in Canada requires knowledge of specific market requirements and procedures, such as

Canadian Customs documentation, bilingual labeling and packaging requirements.

Growth of the green construction segment

For U.S. exporters highly competitive in green building products and technologies, it is worthwhile to share information with Canadian authorities and construction industry professionals that may help them expand the green segment of Canada’s overall construction market. In multilateral discussions, Canadian officials have underscored the need for improved workforce capacity and better understanding of green financing models.

Trans Pacific Partnership

Canada is a party to the Trans Pacific Partnership (TPP) Agreement, a free trade agreement among the United States and 11 other countries that, when it enters into force, will provide important market access benefits to U.S. exporters. Information about TPP benefits to U.S. building product exporters and other information on how TPP will make it easier to sell made-in-America products can be found at <http://trade.gov/fta/tpp/industries/building.asp>.

Know Your Buyer

For building product exports, the importance of specific sales channels and buyer categories varies depending on the target export market. In Canada, ITA experience supporting U.S. building products exporters indicates the following assignment of priority among relevant sales channels:

Figure 15: <u>Sales Channels</u>	Low	Priority Medium	High
Government entities		X	
Architects	X		
Design and build companies	X		
Trade contractors	X		
Building facility managers	X		
Distributors			X
Showroom dealers	X		
Retailers	X		

Opportunities for U.S. Companies

Addressing the types of challenges noted above may help U.S. exporters improve their already impressive share of the Canadian market. This section provides a review of the current state of play and competitive

landscape, suggesting where there may be the greatest room for growth.

For the combined sector, U.S. products hold a 61.9 percent share of Canada’s import market. The United States is the leading source of imports for all subsectors, with the exception of lighting. A look at each of the subsectors provides a more informed perspective on the U.S. competitive position.

Figure 16: Canada’s Import Market

<i>Sector</i>	<i>Imports (2014, USD)</i>	<i>U.S. Rank as Import Source</i>	<i>U.S. Import Market Share</i>
HVACR	\$6.3 bil	1	63.8%
Lighting	\$1.9 bil.	2	33.7%
Plumbing	\$819 mil.	1	41.4%
Wood products	\$2.5 bil.	1	70.7%
Insulation	\$367 mil.	1	83.0%
Windows & Doors	\$587 mil.	1	75.5%
Glass	\$465 mil.	1	84.3%

HVACR

U.S. HVACR products hold the dominant share of Canada’s import market at nearly 64 percent. Canada’s imports of HVACR products from the U.S. grew at a compound annual growth rate of 6.3 percent over 2009 through 2014, while year-on-year exports dropped 2.1 percent in 2014. The five year period saw U.S. subsector market share in Canada drop from 66.9 percent to 63.8 percent.

Top 5 Import Sources and Market Share:

1. U.S. (63.8%)
2. China (10.7%)
3. Mexico (7.6%)
4. Germany (3.3%)
5. Japan (2.4%)

Lighting

Canada increased its imports of U.S. lighting products at a 3.7 percent compound annual growth rate during 2009-2014. But during the same period U.S. import market share declined from 40.7 percent to 33.7 percent. China has surpassed the U.S. as the leader in this import subsector.

Top 5 Import Sources and Market Share:

1. China (42.5%)
2. U.S. (33.7%)
3. Mexico (9.8%)
4. Germany (3.3%)
5. Italy (2.3%)

Plumbing

The U.S. is the largest provider of plumbing products into Canada's import market. Although the U.S. share of that market has seen a slight decline trend, Canada's imports from the U.S. grew at a compound annual growth rate of 3.5 percent during 2009 through 2014.

Top 5 Import Sources and Market Share:

1. U.S. (41.4%)
2. China (29.7%)
3. Mexico (8.7%)
4. Vietnam (4.7%)
5. Taiwan (2.4%)

Wood

Canada is the top ranked market for U.S. wood product exporters, and U.S.-sourced wood products hold the leading share of Canada's subsector imports. Imports from the U.S. have grown at a rate of 7.6 percent annually during 2009 to 2014. The U.S. product share of Canada's import market is 70.7 percent, up from 67.8 percent in 2009.

Top 5 Import Sources and Market Share:

1. U.S. (70.7%)
2. China (15.6%)
3. Germany (1.9%)
4. Chile (1.4%)
5. Austria (1.2%)

Insulation

U.S. insulation products enjoy strong dominance in Canada's import market. Market share has decreased slightly from 2009 to 2014, but still stands at 83

percent. The closest competing import source, China, claims less than 5 percent of Canada's insulation import market.

Top 5 Import Sources and Market Share:

1. U.S. (83%)
2. China (4.6%)
3. Mexico (2.7%)
4. Denmark (1.3%)
5. UK (1.3%)

Windows and Doors

Canada imports more than three quarters of its windows and doors from the United States. U.S. products have long dominated this subsector and enjoy strong brand recognition and reputation for quality. While the U.S. has ceded some market share to competitors in recent years, the amount is modest and imports from the U.S. grew at a rate of 5.2 percent annually during 2009 to 2014.

Top 5 Import Sources and Market Share:

1. U.S. (75.5%)
2. China (12.8%)
3. Mexico (2.0%)
4. Korea (1.7%)
5. Taiwan (1.1%)

Glass

U.S.-sourced glass holds the overwhelming share of Canada's subsector import market at 84 percent. During the five year period of 2009 to 2014, Canada's imports of U.S. glass products grew at a compound annual growth rate of 6 percent and posted 7.9 percent growth year-on-year in 2014.

Top 5 Import Sources and Market Share

1. U.S. (84.3%)
2. China (9.4%)
3. Germany (2.8%)
4. Mexico (0.87%)
5. Japan (0.76%)

Resources for U.S. Exporters

Please visit www.export.gov/canada for information from U.S. Commercial Service (CS) Canada, including

- Market research
- Trade events
- Trade leads
- Services available to U.S. companies
- Contact information for CS offices in Calgary, Montreal, Ottawa, and Toronto
- Info on subscribing to regular updates or connecting on social media
- Other information to assist U.S. exporters with Canada export market development

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Chile

U.S. building products enjoy duty-free market access in general under the U.S.-Chile Free Trade Agreement. Chile has 61 trade agreements in place with other countries that also offer market access benefits. The Chilean market is small, competitive, and price sensitive. Chile offers a stable economic and political environment and low reported corruption, and business is conducted in similar ways as it is in the United States. Chile's construction market favors products that can advance energy efficiency, reduce labor requirements and be environmentally friendly. Resilience also is a long-standing goal in Chile's building sector.

Overall Rank	HVACR	Lighting	Plumbing Products
27	22	23	14
Wood Products	Insulation	Windows & Doors	Glass
28	21	40	68

Chile has achieved a solid recovery from the global financial downturn and a devastating earthquake in 2010, but economic growth has fallen since 2014 and was 2 percent in 2015. Falling commodities prices, particularly copper, have contributed to decreased growth, although Chile's economic fundamentals remain strong. Economic forecasts for Chile remain positive.

Chile's Construction Market

Chile's construction market offers prospects for U.S. building product exporters. Healthy foreign direct investment backing reconstruction and modernization work helped fuel construction industry growth at a rate of 7.8 percent annually during 2009 to 2014. Chile's construction industry is expected to maintain growth through 2018, albeit at a more modest rate, as the government aims to improve the nation's infrastructure, increase investment in industries ranging from retail to mining, and boost residential construction.²² Chile will need to expand and upgrade its port, road and rail infrastructure to serve growing export industries, particularly in anticipation of the Trans-Pacific Partnership Agreement entering into force. Other than private luxury properties, diminished prospects are expected for the residential segment in the wake of recently implemented tax policies.

Energy Efficient Buildings

Chile has developed energy efficiency standards for the building sector and enjoys broad-based public and private sector support for energy efficiency.²³ Increasing the energy efficiency of buildings is a key pillar of its Chile Energy Efficiency Strategy 2020. The country has established its own green building certification system, and Chile also ranks third in Latin America in terms of certifications under the U.S. Green Building Councils' Leadership in Energy and Environmental Design (LEED) building rating system.

Opportunities in Chile for U.S. building product exporters through 2018 are most likely in the following building categories:

- Retail facilities, including shopping malls
- Public and private health facilities
- Educational facilities
- Private buildings, including commercial offices, hotels, other tourism facilities, private homes
- Industrial buildings
- Mining, energy and general industry construction
- Public works and infrastructure (highways, airports, ports, hospitals, prisons)

Challenges & Barriers to Sector Exports

U.S. building products enjoy strong brand recognition and a reputation for high quality in Chile. The challenges noted below affect U.S. exporters across the seven subsectors included in this sector. Engagement to increase U.S. companies' understanding of the Chilean commercial environment and a focus on subsector-specific trade promotion and partner matchmaking are productive approaches to market development.

Highly competitive market environment

While the U.S.- Chile FTA provides duty-free status to U.S. exports in general, Chile also has trade agreements in place with key U.S. trade competitors, including China, European countries and dozens of other nations. Chile has access to global suppliers of the highest-quality building products as well as lower-cost competitors. U.S. suppliers still must overcome transport costs from the United States and deliver on product performance and post-sales service requirements to compete in Chile. An effective way to enter the Chilean market is through a local partner/representative/distributor that can offer after-sales support capability. The local buyer typically will want to purchase products from locally established firms that they can go back to, if a problem arises. Large construction companies, however, may import directly for individual projects. It is very important that the U.S. exporter is aware that the country presents a small and highly competitive and price-oriented market.

Business customs

A capable in-country partner may be needed to help U.S. companies navigate the local markets to understand sales channels, the competitive state of play, applicable regulations and standards, as well as other aspects of the Chilean commercial landscape. One market feature of which U.S. exporters should be aware is the fact that large segments of Chile's economy are controlled by a small number of Chilean economic groups and families. It is a small and tight-knit business community.

Regulatory environment

Detailed knowledge of the product standard and conformity assessment process for construction products is important to building product exporters,

and having access to relevant information is essential in this market of high quality construction with a particular focus on seismic-related conditions. Chile is a member of the World Trade Organization (WTO), and its guidelines follow those of the WTO Technical Barriers to Trade decision. The country's Chamber of Construction, Cámara Chilena de la Construcción, CCHC (www.cchc.cl), and the National Norms Institute, Instituto Nacional de Normalización, INN (www.inn.cl), are active in the regulation of construction standards. INN norms can be purchased online at:

http://ecommerce.inn.cl/Resultado_Busqueda/

Know Your Buyer

For building product exports, the importance of specific sales channels and buyer categories varies depending on the target export market. Overall, ITA's experience supporting U.S. building products exporters in Chile indicates the following assignment of priority among relevant sales channels:

Figure 17:

<u>Sales Channels</u>	Low	Priority Medium	High
Government entities		X	
Architects			X
Design and build companies		X	
Trade contractors			X
Building facility managers		X	
Distributors			X
Showroom dealers			X
Retailers			X

Opportunities for U.S. Companies

Chile imported \$1.3 billion in HVACR, lighting, plumbing, wood products, insulation, windows and doors and glass from the world in 2014. This reflects an 11 percent compound annual growth rate of building product imports during 2009 through 2014. For the sector as a whole, the United States is the second largest source of Chile's imports after China with a 13 percent import market share.

Transportation infrastructure may provide an area of opportunity for U.S. building products, particularly in ports, roads and rails. Chile will need to expand and upgrade its infrastructure to serve its growing export industries in anticipation of the Trans-Pacific Partnership entering into effect. The Trans-Pacific Partnership may soon expand duty-free access to products produced across its 12 member countries,

opening up new supply chain opportunities in the sector as well.

Addressing the types of challenges described above may help U.S. exporters improve their share of Chile's market. This section provides a review of the current state of play and competitive landscape, suggesting where there may be the greatest room for growth.

Figure 18: Chile's Import Market

Sector	Imports (2014, USD)	U.S. Rank as Import Source	U.S. Import Market Share
HVACR	\$62 million	1	50.0%
Lighting	\$245 mil.	2	7.5%
Plumbing	\$147 mil.	5	4.6%
Wood products	\$245 mil.	3	9.5%
Insulation	\$29 million	2	18.9%
Windows & Doors	\$23 million	2	24.7%
Glass	\$28 million	2	16.4%

HVACR

Chile's imports of HVACR products grew at a compound annual growth rate of 10 percent from 2009 to 2014. Imports of HVACR products from the U.S. grew at a staggering rate of 74 percent annually over the same timeframe, during which the import market share of U.S. products grew from 6 percent to the 2014 level of 59 percent. A local chapter of ASHRAE recently opened in Chile.

Top 5 Import Sources and Market Share:

1. United States (59%)
2. Peru (8.1%)
3. Argentina (7.6%)
4. Mexico (4.9%)
5. Bolivia (3.8%)

Lighting

Chile's imports of lighting nearly doubled during the 2009 to 2014 period, with imports of products from the U.S. growing at a compound annual growth rate of 7.4 percent during the same period. U.S.-sourced lighting products now have an import market share of 7.5 percent, well behind those of China, which dominate with more than 67 percent import market share. LED lighting slowly but steadily has gained

share in the Chilean lighting market and is expected to continue to grow due to its energy conservation benefits.

Top 5 Import Sources and Market Share:

1. China (67.6%)
2. United States (7.5%)
3. Germany (3.9%)
4. Korea (3%)
5. Spain (2.3%)

Plumbing Products

Plumbing products sourced in the U.S. hold a 4.6 percent share of Chile's import market, making it the fifth largest source of imports. The Chilean plumbing product import market grew at a healthy 22 percent compound annual growth rate during the 2009 to 2014 period. The same period saw imports from the U.S. growing at 14 percent, which is behind China and other competitors.

Top 5 Import Sources and Market Share:

1. China (42.8%)
2. Mexico (14%)
3. Korea (12.6%)
4. Colombia (4.9%)
5. United States (4.6%)

Wood Products

The United States is the third largest source of wood products in Chile's import market, behind China and Germany. The country's imports of wood products grew at a 19 percent compound annual growth rate during 2009 to 2014, with imports from the U.S. increasing at a rate of 17 percent during the same period. U.S. product market share has decreased slightly from 10.3 percent to 9.5 percent during that timeframe.

Top 5 Import Sources and Market Share:

1. China (31.8%)
2. Germany (15.6%)
3. United States (9.5%)
4. Brazil (8.1%)
5. Spain (7.4%)

Insulation

Chile's imports of insulation have seen very modest growth at a rate of only 1.5 percent during 2009 to 2014, and imports from the United States have

decreased at a rate of nearly 17 percent annually during this timeframe. U.S. product import market share is down to 18.9 percent from its 51 percent level in 2009. Imports of products from China have grown dramatically during the same period. Insulation is seen as a strong import prospect in Chile due to its ability to reduce building energy use.

Top 5 Import Sources and Market Share:

1. China (21.9%)
2. United States (18.9%)
3. Argentina (13.3%)
4. Brazil (10.3%)
5. Germany (7.8%)

Windows and Doors

Chile's imports of windows and doors grew at a healthy 17.5 percent compound annual growth rate during 2009 to 2014, and imports of products from the U.S. grew at an even more robust rate of 29 percent annually during the same period. U.S.-sourced products now hold the second largest share of Chile's window and door import market at 24.7 percent.

Resources for U.S. Exporters

Please visit www.export.gov/chile for information from U.S. Commercial Service (CS) Chile, including

- Market research
- Trade events
- Trade leads
- Services available to U.S. companies
- Contact information for the CS office and staff in Chile
- Info on subscribing to regular updates or connecting on social media
- Other information to assist U.S. exporters with Chile export market development

Non-U.S. Government Resources

- Cámara Chilena de la Construcción, CCHC, (Chilean Construction Chamber), www.cchc.cl
- Instituto Nacional de Estadísticas, INN, (National Statistics Institute), www.inn.cl
- Ministerio de Obras Públicas (Ministry of Public Works), MOP, www.mop.cl
- Corporación de Desarrollo Tecnológico, CDT, (Technology Development Corporation), www.cdt.cl. This entity is part of CCHC, which handles building materials.

Top 5 Import Sources and Market Share:

1. China (25.6%)
2. United States (24.7%)
3. Spain (11%)
4. Denmark (5.7%)
5. Bolivia (5.6%)

Glass

Chile's imports of glass from the U.S. grew at a rate of 10.4 percent annually during the 2009 to 2014 period, exceeding the rate of growth of the country's overall glass imports at 8.6 percent. U.S.-sourced glass imports hold the second largest import market share position in Chile, behind China.

Top 5 Import Sources and Market Share

1. China (30%)
2. United States (16.4%)
3. Belgium (13.4%)
4. Mexico (10%)
5. Spain (9.7%)

China

China is the world's largest construction market and will continue to provide strong opportunity for U.S. building product exporters. Increasing urbanization and national commitments to conserve resources and reduce greenhouse gas emissions drive China's steady commitment to expand the green portion of its massive construction market. Understanding China's regulatory environment, specific market access requirements and relevant trade promotion opportunities will help U.S. exporters compete for expanding sales opportunities.

Overall Rank	HVACR	Lighting	Plumbing Products
3	3	3	42
Wood Products	Insulation	Windows* & Doors	Glass
1	3	75	23

**Rankings note: The low ranking for Windows and Doors is best understood as reflective of a strong downward trend in U.S. window and door exports to China during the 2010 to 2014 period, which drive forward-looking projections down sharply.*

China Construction Market

Although the rate of China's economic growth is slowing, the country's economy and its construction market continue to grow. China is expected to maintain its position as the world's largest construction market for the near future and is expected to account for a significant share of all new global construction between now and 2020.²⁴ Increased urbanization also continues as China progresses in its central National New-type Urbanization Plan, which envisions 60 percent of China's population living in cities by 2020.

These urbanization trends drive the Chinese government's emphasis on increasing green building within its construction sector, in support of its commitment to conserve resources and reduce greenhouse gas emissions. Focusing on buildings is a key element of its national strategy.

Strong growth in the level of green building in China's market is projected through the period of this study. A recent industry survey of Chinese construction industry stakeholders showed a dramatic increase in the percentage of respondents – from 5 percent to 28 percent - who envisioned the majority of their work being green projects within three years.²⁵ The same survey indicated:

- The China green building market is driven by benefits beyond reducing energy use, including improving indoor air quality and protecting natural resources. A focus on healthy communities also is a feature of the China green building landscape.
- New commercial building (office, hotel, retail) is a market segment where 55 percent of Chinese respondents expect to undertake green building, exceeding the global average of 46 percent.
- New high-rise residential (4 floors or higher) is a segment in which 45 percent of respondents indicated that they expect to undertake green projects, exceeding the global average of 25 percent.
- Communities (mixed-use development combining commercial and residential buildings) are a segment where 36 percent of respondents indicated that they expect to take on green projects. This corresponds with China's focus on developing sustainable mega-cities, discussed below.

In 2013, China's State Council launched its Action Plan for Green Buildings, which sets a goal of making 20 percent of all new building construction compliant with specific green building requirements,

among other objectives.²⁶ In support of the Action Plan for Green Buildings, the government is developing a comprehensive set of 17 Chinese standards governing land, energy, water and materials savings; ambient and indoor environment requirements; and other functional requirements. These standards cover building planning and design, construction, retrofit, operation and maintenance, and demolition. Since 2014, all government-invested construction and public buildings greater in size than 20,000 m² must comply with Chinese green building standards.

A variety of policy approaches have been used to drive desired outcomes. Looking at energy efficiency in buildings alone, the following types of measures have been utilized:

- mandatory building energy codes for commercial and residential buildings in cities;
- policies to encourage retrofits in existing buildings;
- national, provincial and city-level financial incentives for energy efficiency level achievement;
- appliance standards; and
- a phase-out of incandescent light bulbs in favor of more efficient options.

Smart Cities

Increased and intentional urbanization also has driven a focus on creating smart cities across China. Nationwide, some 200 Chinese cities have been targeted for “smart” development following the central government’s designation of smart city technology as a sector to be strengthened under the 12th Five Year Plan. In support of the nation’s objectives, the National Development and Reform Commission, Ministry of Industry and Information Technology, Ministry of Public Security, Ministry of Finance, Ministry of Land and Resources, Ministry of Housing and Urban-Rural Development and Ministry of Transport collectively drafted the “Guidance for Facilitating the Healthy Development of Smart Cities.” According to the Guidance, China will launch constructions in 10 areas: Smart Transportation, Smart Grid, Smart Water Utility, Smart Environmental Protection, Smart Health Care, Smart Pension, Smart Community, Smart Household, Smart Education and Smart National Land.

Market Access: Building Product Standards and Conformity Certification

The Chinese government is undertaking a comprehensive approach to evolve its system of standards development. This process must be monitored closely to understand developments that will impact the building products sector. Currently, U.S. building product exporters must be in a position to achieve China Compulsory Certification (CCC) for covered products to certify conformance with Chinese product standards. Obtaining detailed information about standards may be burdensome. Where product-specific Chinese standards do not exist, however, there may be opportunities for U.S. exporters to work with Chinese authorities to inform standards development.

Product-level Promotion

At the product level, there are a number of Chinese procurement list resources that may be useful to U.S. exporters in promoting their products. Among these are:

- National Development and Reform Commission (NDRC) - Catalog of Energy Efficient Products for Government Procurement covers categories such as HVAC, lighting equipment, windows and glass, among others.
- MOHURD - Building Material Procurement Platform for Low-Income Housing database covers sector products, such as insulation, doors and windows, and a number of other building products.
- MOHURD – Catalog of Green Building Materials and Products
- China Quality Certification Center (CQCC) – Catalog of Energy Efficient and Water Saving Products for Public Institutions
- CQC – Catalog of Energy Efficient Equipment and Technology Services for Business

Challenges & Barriers to Sector Exports

U.S. sector exporters enjoy strong brand recognition and a reputation for high product quality and reliability in China. The following types of challenges

often constrain U.S. exporters’ market access and market development.

Highly competitive market environment

U.S. sector exporters compete in the China market against leading global manufacturers that are renowned for product quality and innovation. Winning sales often requires regular direct engagement with buyers to distinguish specific product performance versus that of competitors.

To maximize impacts, USG trade promotion events (trade shows, trade missions and reverse trade missions) should be undertaken on a subsector specific basis to ensure focused engagement with potential buyers and specific discussion of a product’s performance attributes.

Tariffs

U.S. products compete well in an environment where leading competitors face the same duties as U.S. firms. Vigilance should be applied to note opportunities for the U.S. – or leading competitor nations – to achieve duty-free or reduced-duty status for exports to China.

Complex regulatory environment

China’s construction arena is heavily regulated, which leaves it subject to potential change without significant warning from Chinese authorities. Without a strong local presence or local partners, understanding regulatory complexities poses a challenge to U.S. exporters. Detailed knowledge of the product standard and conformity assessment process is of particular importance to sector exporters.

In this context, public-private partnership models of export program development have proven successful since the government-to-government interface provides opportunities for leverage.

Business customs

The commercial landscape in China features cultural and political features that demand investment in longer-term business relationships. Sales are typically not made and sustained until after a business becomes recognized in the marketplace as having products well-suited to Chinese buyers and is

backed by local relationships. Provision of strong after-sales support is essential to maintaining and growing business in China.

Geographic size and diversity

Market information is best tailored to specific locations and product types to be of real use.

Choices must be made by exporters as to which trade promotion events to pursue in a vast country with many first and second-tier cities to address. Specific types of opportunity leads are needed.

For exporters unable to attend multiple trade promotion events, information on how to have products included in potentially important procurement lists and databases may be beneficial.

IPR Protection

In some subsectors, U.S. exporters have reported finding products with forged certification stamps and seals and with misrepresentations of product performance. ITA is available to assist U.S. exporters with IPR concerns. The full suite of services available to U.S. exporters is discussed in the Key Findings section of this report.

Know Your Buyer

For building product exports, the importance of specific sales channels and buyer categories varies depending on the target export market. Overall, ITA’s experience supporting U.S. building products exporters in China indicates the following assignment of priority among relevant sales channels:

Figure 19: Northern and Eastern China

Sales Channels	Priority		
	Low	Medium	High
Government entities			X
Architects		X	
Design and build companies			X
Trade contractors	X		
Building facility managers	X		
Distributors		X	
Showroom dealers	X		
Retailers	X		
Other	X		

Figure 20: Southern China

Sales Channels	Low	Priority Medium	High
Government entities		X	
Architects			X
Design and build companies			X
Trade contractors			X
Building facility managers			X
Distributors			X
Showroom dealers	X		
Retailers	X		
Other	X		

Opportunities for U.S. Companies

Addressing the types of barriers discussed above may help U.S. exporters improve their share of the China market. This section provides a review of the current state of play and competitive landscape, suggesting where there may be the greatest room for growth.

For the sector as a combined whole, in 2014, U.S. products maintained the lead over all international competitors in terms of China import market share. Until 2013, products from Japan had held this position for some time. A view of each subsector individually gives a more informed sense of the competitive environment.

Figure 21: China's Import Market

Sector	Imports (2014, USD)	U.S. Rank as Import Source	U.S. Import Market Share
HVACR	\$14 bil.	3	11.3%
Lighting	\$2.2 bil.	5	7.4%
Plumbing	\$855 mil.	5	9.1%
Wood products	\$22.1 bil	2	13.1%
Insulation	\$571 mil.	1	21.9%
Windows & Doors	\$96 mil.	8	4.7%
Glass	\$2.7 bil.	2	28.6%

HVACR

There is strong import demand for high-quality HVACR products in China, and the country's subsector imports from the U.S. grew at a compound annual growth rate of 5 percent during 2009 through

2014. During that time period, the U.S. share of China's HVACR import market fluctuated only slightly, decreasing from 11.8 percent to 11.3 percent.

Top 5 Import Sources and Market Share:

1. Germany (21.2%)
2. Japan (18.6%)
3. U.S. (11.3%)
4. Korea (7.9%)
5. China (5.4%)

Lighting

Lighting represents an area of opportunity for U.S. subsector exporters, particularly given Chinese government encouragement of energy efficient retrofits of buildings. Lighting is widely viewed as a "low hanging fruit" investment option to increase energy performance in existing buildings. New construction also offers strong opportunity.

China's imports of lighting products from the U.S. declined at an annual rate of 3.1 percent over 2009 through 2014, but despite this absolute decline, the U.S. share of China's lighting import market grew from 3.6 percent to 7.4 percent over the same period. U.S. sourced products now hold the fifth largest share of China's subsector import market.

Top 5 Import Sources and Market Share:

1. Japan (24.7%)
2. Germany (17.8%)
3. China (11.2%)
4. Korea (10%)
5. U.S. (7.4%)

Plumbing

U.S. plumbing products held a 9.1 percent share of China's subsector import market in 2014, reflecting significant growth in share from 5.1 percent in 2009. China's imports of plumbing products from the U.S. grew at a 14.3 percent compound annual growth rate during the 2009 to 2014 period, and the U.S. is now the fifth largest source of China's imports.

Top 5 Import Sources and Market Share:

1. Japan (21%)
2. China (13.9%)
3. Germany (13.8%)
4. Korea (11.9%)
5. U.S. (9.1%)

Wood

China's imports of wood products from the U.S. grew at an astonishing 41 percent compound annual growth rate over 2009 to 2014. Looking forward, China continues to represent an enormous market opportunity for U.S. wood products exporters, who currently claim 13.1 percent of the import market and are the second largest source of subsector imports after Russia.

China's demand for wood and wood products has shown extremely strong growth, with that trend expected to continue through 2018. While Chinese importers have shown tremendous interest in importing logs or least-processed wood and undertaking value-added production in China, U.S. exporters have strong opportunities in higher value-added wood product sales.

Top 5 Import Sources and Market Share:

1. Russia (14.3%)
2. U.S. (13.1%)
3. Canada (9.6%)
4. New Zealand (8.3%)
5. Thailand (5.6%)

Insulation

The U.S. is now China's top source of insulation imports. China's insulation imports from the U.S. have increased at a rate of 23.1 percent annual growth during 2009 to 2014, standing at 21.9 percent import market share at the end of that period, up from 14.6 percent at the beginning.

Resources for U.S. Exporters

Additional information on green building-related opportunities for U.S. companies can be found in [China's Growing Green Building Industry and How U.S. Companies Can Get Involved](#).²⁷

Please visit www.export.gov/china for information from U.S. Commercial Service (CS) China, including

- Market research
- Trade events
- Trade leads
- Services available to U.S. companies
- Contact information for CS offices in Beijing, Chengdu, Guangzhou, Shanghai, Shenyang and Wuhan
- Info on subscribing to regular updates or connecting on social media
- Other information to assist U.S. exporters with China export market development: Inquiries regarding export to China may be directed to the China Business Information Center, chinabiz@trade.gov.

Top 5 Import Sources and Market Share:

1. U.S. (21.9%)
2. Japan (18.3%)
3. China (10.6%)
4. Taiwan (10.1)
5. Belgium (6.6%)

Windows and Doors

The U.S. share of China's window and door import market fell to 4.7 percent in 2014, down from 15.2 percent five years prior. The U.S. is now China's eighth largest source of subsector imports.

Top 5 Import Sources and Market Share:

1. Germany (23.8%)
2. Korea (12.1%)
3. Italy (9.3%)
4. Norway (7.2%)
5. China (7.0%)

Glass

China's imports of glass from the U.S. increased at an astounding 68 percent compound annual growth rate during 2009 to 2014. The U.S. now ranks second as a source of imports in China's glass subsector, with 28.6 percent import market share.

Top 5 Import Sources and Market Share

1. Korea (8.2%)
2. China (2.2%)
3. Japan (40.8%)
4. U.S. (28.6%)
5. Taiwan (13.7%)

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Gulf Region

Ongoing priority construction activity in the Member States of the Gulf Cooperation Council (GCC) and broad regional interest in green building drive expectations of continuing opportunity for U.S. building product exporters in the Gulf Region through 2018. Free trade agreements enable duty free access to markets in Bahrain and Oman, and U.S. products compete well in the face of a 5 percent common tariff in other GCC markets. Oil price declines have suppressed GCC imports of HVACR, lighting, plumbing products, wood products, insulation, windows and doors and glass since 2014, but longer-term prospects are positive.

Overview of Gulf Region Markets

2018 Export Market Rankings, GCC Member States						
	Saudi Arabia	UAE	Qatar	Oman	Kuwait	Bahrain
HVAC	4	14	36	44	35	54
Lighting	5	15	22	45	52	62
Plumbing	3	4	12	48	43	54
Wood	26	19	52	68	53	60
Insulation	35	17	28	55	18	73
Doors & Windows	5	12	72	34	19	46
Glass	19	5	64	45	10	30

An intensifying commitment to green building has created export opportunities for U.S. companies in the Gulf Region as the countries look to better manage limited water resources and improve energy efficiency. At the same time, recent decreases in oil prices have slowed overall economic growth and driven a dramatic decrease in the level of building product imports for the region as a whole beginning in 2014. Looking toward 2018, expectations of the vitality of construction markets and growth segments vary on a country-by-country basis among the GCC Member States.

Taken together, GCC Member States' imports of U.S. HVACR, lighting, plumbing product, wood product, insulation, door and window and glass imports grew at a healthy 26 percent compound annual growth rate over the 2009 to 2014 period, even when factoring in dramatic negative 73 percent year-on-year (YoY) decline in GCC building product imports from the U.S. in 2014. During the same 2009 to 2014 period, the GCC's imports from the world overall grew at a rate of 15 percent annually, posting negative 53 percent YoY growth in 2014.

GCC Member States' Approaches to Sustainable Construction

The GCC Member States share a strong interest in increasing building performance to achieve environmental benefits, with energy efficiency and water conservation being key focal areas for the hot, arid climate zone. For some GCC countries, environmental sustainability and efficiency in building construction are part of government priorities to diversify the economy from oil dependency, promote domestic manufacturing and create jobs. While each country has taken different measures to promote a more sustainably built environment, there also are indications of interest in aligning certain initiatives across the region to facilitate commerce and ensure that the world's leading technologies can be used in regional construction projects.

One such emergent area involves construction codes, specifically the concept of developing a regionally aligned green building code. Such a code would outline minimum requirements for energy and water efficiency, indoor air quality and other core elements of building performance. While this remains a concept under development, the fact that authorities in each country have indicated an interest in exploring a harmonized regional green code bodes well, signaling recognition of the ability

of codes, via the standards they reference, to facilitate trade and enable world-tested solutions to address common climate and resource challenges. The current standards and codes environment in the Gulf Region often presents a complex navigational challenge.

Saudi Arabia

Like other Gulf States, Saudi Arabia is focused on diversifying its economy away from the oil and gas sector, including a strong push into supporting the tourism market. Investments in the tourism sector, as well as in infrastructure and residential markets, to support a growing population is projected to fuel growth of Saudi Arabia’s construction market at a healthy 11 percent compound annual rate of growth through 2018.²⁸ Saudi Arabia is expected to continue pursuing expansionary fiscal policy through 2018. The increase in government spending specifically targets healthcare and education, which will include construction of schools, hospitals, major infrastructure projects and some 500,000 new affordable homes.

The Saudi Green Building Forum (SGBF), established recently by the Saudi government, is charged with developing laws and regulations that promote green building initiatives, promoting the collection of standards and systems for green building, disseminating green building information, engaging stakeholders and promoting green building concepts and cultural awareness of green building among citizens through workshops, conferences and publications. The U.S. Green Building Council’s LEED building rating system is recognized in projects in Saudi Arabia, and SGBF is the sole authorized Education Delivery Partner for LEED.

A recent industry survey on global green building trends included investigation of construction industry stakeholders in Saudi Arabia and 10 other countries in the Middle East and North Africa and demonstrated strong growth expectations for green building in Saudi Arabia.²⁹ Findings included the following:

- Thirty two percent of respondents from Saudi Arabia indicated an expectation to do 60 percent or more of their work on green projects by 2018, up from 8 percent in 2015.

- New commercial construction (office, retail, hotels) is the top ranking construction sector for 44 percent of respondents from Saudi Arabia.
- Nearly as many respondents expect to do green projects in new institutional construction (schools, hospitals, public buildings) in the next three years.
- Just 22 percent of respondents in Saudi Arabia indicated an expectation of involvement in green retrofit of existing buildings in Saudi Arabia, and just 13 percent indicated that they envision doing green project work in commercial interiors by 2018.

Know Your Buyer

For building product exports, the importance of specific sales channels and buyer categories varies depending on the target export market. In Saudi Arabia, ITA experience supporting U.S. building products exporters indicates the following assignment of priority among relevant sales channels:

Figure 22:

Sales Channels	Low	Priority Medium	High
Government entities			X
Architects	X		
Design and build companies		X	
Trade contractors		X	
Building facility managers		X	
Distributors	X		
Showroom dealers	X		
Retailers	X		
Other	X		

United Arab Emirates (UAE)

Among GCC Member States, the UAE has the greatest industrial diversification, and the government continues to focus on advancing manufacturing, construction and services to create economic activity beyond the oil and gas sector. The UAE construction industry is projected to grow at a 6.5 percent compound annual growth rate through 2019.³⁰ Investment in infrastructure, commercial, residential and energy projects are expected to fuel this growth.

The UAE has the highest share of green buildings in the MENA with 65 percent of the region’s green buildings. Construction firms in the UAE are early

and strong adopters of green building, reporting in a 2013 global industry survey³¹ that more than half of their ongoing projects were green. The high levels of existing adoption are noted as reflecting government policies and regulations. Among these policies is the existing government mandate that all of its own buildings be green.

In Abu Dhabi, the Urban Planning Council established the Pearl Rating System (PRS) in support of its *Estidama* sustainable development initiative. This system rates the sustainability of residential communities, buildings and villa homes from design to construction to operation, specifically reflecting the requirements of a hot, dry climate zone that requires significant energy for air-conditioning, has a scarcity of water and experiences high evaporation as well as infrequent rain. The PRS establishes guidance and requirements, with five possible levels of certification. The system includes eight categories of mandatory and voluntary credits, and all mandatory credits must be met to achieve the 1 Pearl rating. All new development projects in Abu Dhabi must achieve at least the 1 Pearl rating, while government office projects must achieve, at minimum, a 2 Pearl certification.

The Green Building Regulations and Specifications was launched in 2012 for public buildings in Dubai and later in 2014 for the private commercial buildings. The Dubai system is not a rating system but is written as a code list of green features and methodology that need to be met at design stage and implemented in the construction stage. The Green Building Regulations consist of the best international standards adapted to the local conditions of Dubai. The aim is to improve the performance of buildings by reducing the consumption of energy, water and materials; improving public health, safety and general welfare; and enhancing the planning, design, construction and operation of buildings. In 2020, Dubai will host the World Expo 2020 (formerly known as the World's Fair), and a key theme will be sustainability; thus, the emirate's emphasis on sustainability (and related, green build) is expected to continue.

Target green building sectors: The greatest area of planned green construction activity for UAE firms in the above-referenced survey is in the new institutional sector (government office buildings, hospitals and schools), which was reported by nearly three-quarters of responding firms. The other

market segments reflecting strong planned green activity through 2016 include new commercial buildings (retail, office, hotels) and community projects. Because of the high level of new construction activity, it can be expected that retrofits are not prominent in green building forecasts for the UAE apart from buildings being extended and renovated, where such works require building permit from respective municipalities. Nonetheless, the topic of retrofitting is increasingly being raised by government officials, especially after the fire incident at the Address Hotel in Dubai in December 2015.

U.S. firms face tough competition from local property developers in the UAE, such as EMAAR, Aldar and others, though many possibilities for collaborating, advising and subcontracting do exist. U.S. firms should be prepared to pre-qualify with UAE developers and government agencies in order to respond to tenders.

The government of Dubai will make significant investments in construction in preparation of the World Expo 2020, for which 100 new hotels and numerous other event and infrastructure projects are planned. American companies exploring future business opportunities will need to demonstrate expertise to overcome Abu Dhabi's Pearl Rating System processes and approvals and the Dubai Green Regulations.

Know Your Buyer

For building product exports, the importance of specific sales channels and buyer categories varies depending on the target export market. In UAE, ITA experience supporting U.S. building products exporters indicates the following assignment of priority among relevant sales channels:

Figure 23:

<u>Sales Channels</u>	Low	Priority Medium	High
Government entities	X		
Architects		X	
Design and build companies			X
Trade contractors		X	
Building facility managers			X
Distributors		X	
Showroom dealers	X		
Retailers		X	

Qatar

The construction industry in Qatar is projected to expand at a compound annual growth rate of 13.3 percent through 2018.³² Despite budget shortfalls and the government's efforts to slow down spending in some areas, no announcement of project cancelations have been made. Robust government spending is expected to continue in support of Qatar's National Vision 2030, which is geared to developing a knowledge-based economy that is diversified beyond the traditional energy (natural gas) sector. Part of the major infrastructure projects (road projects specifically) have been de-scoped, and this trend is expected to continue through the end of 2016. Large-scale government investment can be expected in the education and healthcare sectors. The government of Qatar also will make considerable construction investment in support of infrastructure and buildings required to host the FIFA World Cup in 2022, which is expected to include housing and other real estate development projects, in addition to stadium, hotel, transport and other infrastructure projects.

The Global Sustainability Assessment System (GSAS), developed in 2010 by the Gulf Organization for Research and Development (GORD), is Qatar's rating system for green buildings. With 140 sustainability assessment areas, GSAS is a comprehensive mechanism for promoting sustainable urban development while recognizing specific local requirements. Certification criteria are divided among eight elements (energy, water, indoor environment, cultural and economic value, site, urban connectivity, material, and management and operations), with the greatest weight assigned to the energy and water elements. GSAS was made part of the Qatar Construction Standards 2010. It is mandatory for all public and private sector projects to obtain GSAS certification.

Know Your Buyer

For building product exports, the importance of specific sales channels and buyer categories varies depending on the target export market. In Qatar, ITA experience supporting U.S. building products exporters indicates the following assignment of priority among relevant sales channels:

Figure 24:

Sales Channels	Priority		
	Low	Medium	High
Government entities			X
Architects	X		
Design and build companies			X
Trade contractors			X
Building facility managers		X	
Distributors		X	
Showroom dealers		X	
Retailers			

In Qatar, architects typically approve or prequalify building material suppliers' product specifications but do not buy on behalf of the client. Such firms either have a sister trading company that would handle purchasing or would pass on the specifications to the main contractor to select the supplier.

Kuwait

Expected ongoing robust activity in Kuwait's construction sector is fueled in part by the Government of Kuwait's \$104 billion development plan, which includes the planned construction of eight new public hospitals and dramatic expansion of nine existing healthcare facilities. Public and private sector investment has fueled the continuing expansion of a wide range of residential and commercial construction projects. U.S. building products are well-received in Kuwait, and the country's construction professionals are familiar with U.S. construction techniques and materials. The Kuwait Green Building Council was launched in 2012 and is working to promote the U.S. Green Building Council's LEED green building rating system in Kuwait.

Oman

The construction industry in Oman is projected to expand at a compound annual growth rate of 13.3 percent through 2018.³³ After the U.S.-Oman Free Trade Agreement came into force in 2009, U.S. building product exports to Oman grew an impressive rate. As the Omani leadership works to diversify its economy and attract foreign investment, it has placed a focus on improving sectors such as tourism, healthcare, higher education and various industrial sectors. Expansion of any of these arenas suggests facility construction that will create opportunities for U.S. exporters. Looking forward to 2018, continuing government investment can be

expected in tourism facility and infrastructure investment, as well as institutional investments, including hospitals and schools.

Bahrain

The construction industry in Bahrain is projected to expand at a compound annual growth rate of 13.3 percent through 2018.³⁴ The Kingdom’s Economic Vision 2030 highlights the need for a more diverse economic base, with broader privatization, industrialization, and training and education of the Bahraini workforce. In support of this vision, the government is working to attract foreign investment to drive the expansion of six economic clusters: tourism, healthcare, education, information and communications technology fields, business services and professional services.

The U.S.-Bahrain Free Trade Agreement has been in effect since 2006, meaning U.S. building product exports enjoy duty-free status. Following implementation of the FTA, the impacts of the global financial crisis hit and lingered in Bahrain, putting a downward drag on its construction market. While larger-scale public infrastructure projects continued to be funded, many luxury residential type projects were halted outright in the aftermath of the crisis. The Bahrain Sovereign Fund stepped in during 2013 to ensure their viability.

The government of Bahrain is expected to continue focusing on housing development, affordable housing, in particular, working together in public-private partnerships. In 2012, Bahrain’s Ministry of Housing announced a \$9.6 billion five-year plan to build housing units and provide personal finance products.

Know Your Buyer

For building product exports, the importance of specific sales channels and buyer categories varies depending on the target export market. In Bahrain, ITA experience supporting U.S. building products exporters indicates the following assignment of priority among relevant sales channels:

Figure 25:

<u>Sales Channel</u>	Low	Priority Medium	High
Government entities			X
Architects	X		
Design and build companies		X	
Trade contractors		X	
Building facility managers		X	
Distributors	X		
Showroom dealers	X		
Retailers	X		
Other	X		

Challenges & Barriers to Sector Exports in GCC

Tariffs

U.S. building products enter the markets in Bahrain and Oman duty-free under the Free Trade Agreements the United States has with these countries. With regard to the other GCC Member States, the current status of the GCC Customs Union means that products manufactured outside the GCC are subject to a common 5 percent import duty, with exceptions for select product categories that do not impact the building product. Products manufactured within one GCC Member State enter all other Member States duty-free. Some American companies whose products are used in construction, such as glass, have decided to open manufacturing plants in the region to take advantage of the GCC Customs Union.

Highly competitive market environment

The Gulf markets have close proximity to high-quality European products and strong logistics relationships with lower-cost suppliers in Asia. While enjoying a strong reputation for quality and reliability in the region, U.S. building product suppliers still must overcome transport costs and deliver on product performance and post-sales service requirements to compete in Gulf region markets. Winning sales requires regular direct engagement with buyers to distinguish specific product performance versus that of competitors. To provide needed sales follow-up support, U.S. exporters are well served by an in-country presence.

Trade promotion activities should consider multiple elements: attunement to country-specific market opportunities and the ability of the target trade event to perform a regional convening role for buyers. Reverse trade missions that bring Gulf

buyers to the United States also are meaningful. Events should facilitate U.S. building product exporters' full elaboration of their products' green features and relevance to local rating systems.

Standards and conformity assessment

Under the GCC Standards Organization (GSO), the vision is to unify the Member States' standards and conformity assessment regimes. This remains a work in progress, and until a uniform GCC standard and conformity assessment process is established, each Member State applies its own standards, conformity assessment and labeling requirements; in the case of the UAE, the standards and codes even differ between Abu Dhabi and Dubai.

While some international standards developed by U.S.-based standards development organizations (SDOs) have been adopted in various Member States, the U.S. industry has expressed concerns that some may be moving toward a more restrictive standards regime. Standards established by European SDOs are noted as gaining increased attention. In addition to a standards environment lacking in consistent clarity and transparency, industry has expressed concern about a similar lack of clarity in conformity assessment.

Resources for U.S. Exporters

Please visit the country-specific sites listed below for information from the U.S. Commercial Service (CS) on:

- Market research
- Trade events
- Trade leads
- Services available to U.S. companies
- Contact information for CS offices throughout the region
- Info on subscribing to regular updates or connecting on social media
- Other information to assist U.S. exporters with Gulf Region export market development

Bahrain	http://bahrain.usembassy.gov/tradeandcommerce.html
Kuwait	export.gov/kuwait/
Oman	export.gov/oman
Qatar	export.gov/qatar
Saudi Arabia	export.gov/saudiarabia
United Arab Emirates	export.gov/unitedarabemirates

Many American companies in the region are largely staffed by sales, marketing and business development specialists, whom may not have expertise in regulatory environments or standards setting. As such, when local standards organizations reached out to U.S. businesses for comments on standards or other regulations, the responses were muted. With this in mind, it may behoove American companies to identify team members as POCs for standards developers and other regulatory agencies or work with local chambers of commerce or bilateral trade groups to coordinate industry input.

The full suite of USG tools that can be brought to bear in assisting exporters with standards and conformance issues is detailed in the Executive Summary and Findings section of this report.

Other options for addressing the markets

While exporting products from the United States is one approach to market penetration in the GCC, leading U.S. building product suppliers increasingly are sourcing products for sales in the GCC from non-U.S. manufacturing facilities they have established in the region or in other more proximate or lower-cost international markets.

Japan

Japan's ranking of fourth as a 2018 export market for the building products sector is driven in large part by strong performance and future prospects for U.S. wood products exports. Japan is a top 10 market for five of the seven building product subsectors. But the presence of world-leading, domestic Japanese manufacturers of HVACR, plumbing, glass and other building products constrains Japan's import demand. For U.S. wood product exports, Japan continues to be a promising market.

Overall Rank	HVACR	Lighting	Plumbing Products
4	9	7	11
Wood Products	Insulation	Windows & Doors	Glass
4	8	8	24

Japan is the second largest construction market outside the United States. It is a stable, advanced market that is strongly receptive to the high quality building products in which U.S. manufacturers are competitive. Japan's population, and particularly its senior population, has high disposable income, a commitment to energy efficiency and resource conservation and a strong interest in new technologies to achieve greater environmental friendliness in the built environment. The Japanese market includes dense urban centers and extensive existing building stock in need of renovation. Seismic resilience is a long-standing requirement in Japan.

The Japanese construction industry is projected to grow at a rate of 1.2 percent annually through 2019,³⁵ with civil engineering works showing a slightly higher rate of expansion than buildings. The current hot topic in the Japanese construction industry is the Tokyo Olympic Games in 2020. Many public projects are expected in the coming years in athletic facilities and associated infrastructure. In addition, because of the rapid increase in the number of foreign tourists for the last few years, many new hotel projects are expected. At the same time, as Japan's aging population grows, demand is increasing for suitable healthcare and elderly living facilities. Japanese government estimates see people aged 65 and above as 40 percent of the nation's population by 2060. In 2013, there were 1.1 million more elderly in Japan than the previous year. The current labor shortage in the construction industry may place some constraints on expansion in the building market.

Japan's wooden housing market is the largest in the world outside the United States, and the residential housing sector accounts for an estimated 40 percent of wood use in Japan.³⁶ It is unsurprising that wood is a huge driver of Japan's 2018 ranking as a U.S. export market for the building products sector. Wood products are the leading subsector, claiming the majority of building product exports to Japan in 2015 and presenting the greatest projected growth through 2018.

Green Building in Japan

The Japanese government recognizes that housing and other buildings account for 30 percent of total energy consumption in Japan, with significant increases in energy use by buildings in the past two decades compared with sectors such as transportation and industrial use.³⁷ Accordingly, buildings have been the target of a series of regulations, guidelines and incentives to improve energy conservation reaching as far back as the Energy Saving Act of 1979. Since 2012, the Japanese government has embarked on a focused roadmap to roll out a series of building energy efficiency policies, including programs to:

- promote the construction of houses and buildings with higher energy efficiency performance (via labeling and energy efficiency information provision, promoting construction of zero energy homes in which the total amount of energy used is roughly equal to the renewable energy created on site, promoting

- use of advanced carbon dioxide reduction technologies and use of certification programs);
- assure minimum energy efficiency performance of houses and buildings via revised Energy Efficiency Standards for large, medium and small buildings (earliest mandatory compliance from 2017);
- improve energy efficiency of existing houses and buildings (via promotion of renovations, improvement of building materials and equipment, and considering evaluation and labeling system for energy efficiency); and
- increase capabilities of individuals and organizations (trainings, evaluations, improving quality of building materials and equipment).

Provisions pertaining to fundamental “green” areas, such as energy efficiency, indoor air quality and water efficiency, are included in Japan’s Building Standard Law (BSL). On the market-based “pull” side of the equation, the Japan Green Building Council maintains the building rating system known as the Comprehensive Assessment System for Built Environment Efficiency (CASBEE). Criteria for this voluntary rating system include energy (thermal load, natural energy, building system efficiency), water efficiency, and indoor environment (sonic, thermal, illumination, air quality), among other rating categories.

Challenges & Barriers to Sector Exports

Highly competitive market environment

As noted above, Japan has a strong base of domestic manufacturers producing building products at a global leadership level. In Japan’s import market, U.S. sector exporters also must compete against other leading global manufacturers renowned for product quality and innovation. Winning sales requires regular direct engagement with buyers to establish familiarity and confidence and to distinguish specific product performance versus that of competitors.

Tariffs

U.S. products compete well in Japan in the current WTO tariff environment, but tariffs place a burden on U.S. exporters all the same. Additionally, in Japan –and in priority realms, such as wood products trade – tariffs escalate, meaning they increase with the

level of technical sophistication or processing inherent in the product’s manufacture.

Trans-Pacific Partnership (TPP)

Japan is a party to the Trans Pacific Partnership (TPP) Agreement, a free trade agreement among the United States and 11 other countries that, when it enters into force, will reduce tariffs and provide other important market access benefits to U.S. exporters. Information about TPP benefits to U.S. building product exporters and other information on how TPP will make it easier to sell made-in-America products can be found at <http://trade.gov/fta/tpp/industries/building.asp>.

Incentives to prefer local content

Certain regulations in Japan have served to incentivize use of local Japanese products over imports of building products. One recent example of this in the leading sector segment of wood products is the Wood Use Point Program, which concluded in 2014. The program gave financial incentives for the use of Japanese wood species. While U.S. wood product exporters succeeded in gaining an exemption for Douglas Fir (i.e. obtained classification for Douglas Fir as a local species for purposes of the program), it stands as an example of government-driven practices that must be monitored to ensure a level playing field.

Standards and conformity assessment

Standards and conformity assessment requirements are oft-cited non-tariff trade barriers for building product exporters. U.S. suppliers must be aware of the Japanese standard and make sure to have proof of conformance. In Japan, there are cases in which a standard or conformity assessment may not be mandatory but may be required for market acceptance. The full suite of USG tools that can be brought to bear in assisting exporters with standards and conformance issues is detailed in the Executive Summary and Findings section of this report.

Know Your Buyer

For building product exports, the importance of specific sales channels and buyer categories varies depending on the target export market. In Japan, the most important relationship for a U.S. building products exporter is the one with Japanese

agents/distributors. There are no other government or private sector entities that can heavily impact a U.S. exporters' success in Japan.

These agents/distributors fulfill not only that role but also serve as important business partners that can provide market information, such as Japanese regulations and customers' needs. It is sometimes necessary for U.S. companies to work with their agents/distributors to modify or develop products for the Japanese market. It may be also important to develop marketing strategies with Japanese agents/distributors.

Overall, ITA's experience supporting U.S. building products exporters in Japan indicates the following assignment of priority among relevant sales channels:

Figure 26:

Sales Channels	Priority		
	Low	Medium	High
Government entities	X		
Architects		X	
Design and build companies		X	
Trade contractors	X		
Building facility managers	X		
Distributors			X
Showroom dealers	X		
Retailers	X		
Other	X		

Opportunities for U.S. Companies

For the sector as a whole, the United States is currently the second largest source of Japan's imports, claiming eight percent of the Japanese import market after China's dominant 32 percent market share position. A look at each of the subsectors provides a more informed perspective on the U.S. competitive position.

Figure 27: Japan's Import Market

Sector	Imports (2014, USD)	U.S. Rank as Import Source	U.S. Import Market Share
HVACR	\$7.7 billion	3	9.1%
Lighting	\$1.5 billion	5	4.3%
Plumbing	\$776 mil.	9	2.5%
Wood products	\$10.9 billion	5	8.4%
Insulation	\$161 million	2	18.8%
Windows & Doors	\$795 million	4	2.9%
Glass	\$196 million	5	12.5%

HVACR

Japanese firms are among the leading global HVACR manufacturers, setting a high competitive bar for entry for higher quality imported products, such as those from the United States. During 2009 through 2014, Japan's imports of HVACR grew at a compound annual growth rate of 8.9 percent. Over half of these imports came from China, but we note that Japanese manufactures make their products for the Japanese market in China and other Asian countries. Most, if not all, of these products sourced in China may be Japanese brand products.

While subsector imports from the United States grew at a rate of 8.4 percent during the same period, these products saw a slight loss in import market share to 8.4 percent in 2014 from 9.1 percent in 2009. The differences between U.S. and Japanese air-conditioning systems make it difficult for U.S. companies to enter certain segments of the Japanese market. In the U.S., central air-conditioning is common, while in Japan, room-by-room air-conditioning is common.

Top Import Sources and Market Share:

1. China (52.9%)
2. Thailand (11.3%)
3. United States (9.1%)
4. Germany (4.9%)
5. Korea (4.2%)

Lighting

Japan's imports of lighting from the world grew at 9.1 percent annually during 2009 through 2014, while its imports of lighting from the U.S. fell, achieving a -0.33 compound annual growth rate. U.S. lighting imports currently hold a 4.3 percent share of Japan's lighting import market, down from 6.7 percent in 2009. Products from China dominate nearly two thirds of Japan's lighting import market, but many of these products may be Japanese brand products produced at Japanese factories or subcontractors located elsewhere in Asia.

Top Import Sources and Market Share:

1. China (62.1%)
2. Germany (6.7%)
3. Korea (5.4%)
4. Indonesia (5.2%)
5. United States (4.3%)

Plumbing

Japan's imports of plumbing products are great at a compound annual growth rate of nearly 13 percent during 2009 through 2014, and its imports of subsector products from the United States grew at 7.7 percent during the same period. Plumbing product imports from the United States held a 2.5 percent share of Japan's import market, down from 3.1 percent in 2009. The United States is Japan's ninth largest source of plumbing product imports. Similar to lighting and many other building products, plumbing products imported from Asian countries may be Japanese brand products produced at Japanese company factories located elsewhere in Asia.

Top Import Sources and Market Share:

1. China (50.6%)
2. Thailand (10.8%)
3. Vietnam (9.5%)
4. Philippines (7.5%)
5. Korea (7.3%)

Wood

Japan's imports of wood products grew at a compound annual growth rate of 6 percent during 2009 through 2014, while the nation's imports from the United States achieved nearly 9 percent annual growth during the same period. U.S. market share in Japan's wood import market has been growing, standing at 8.4 percent in 2014, up from 7.4 percent in 2009. The United States is Japan's fifth largest source of wood product imports.

U.S. wood product exporters benefit from the United States being an established historical wood product supplier; proximity to Japan of suppliers on the U.S. west coast; the high quality and consistency of U.S. wood products; perceptions of legal and sustainable sourcing of wood products in the United States; and the Japanese market demand for U.S. wood species. U.S. industry sees particular market opportunity in Japan in high-value market segments, such as traditional post-and-beam style housing, the emergent do-it-yourself segment, and wide-ranging renovation areas.

It is important to note that the ranking below shows imports of all wood products, regardless of end use. These may include wood products ultimately not utilized in the construction of buildings.

Top Import Sources and Market Share:

1. China (11.4%)
2. Canada (11.1%)
3. Malaysia (10.3%)
4. Indonesia (9.4%)
5. United States (8.4%)

Insulation

U.S.-sourced insulation products claim a healthy 19 percent share of Japan's import market, but occupy a distant second place share of the market compared with from products from China at 34 percent. China's subsector import market dominance grew from 19 percent share in 2009 to current levels. The United States' share has fallen slightly from 22 percent in 2009 to 19 percent in 2014.

Top Import Sources and Market Share:

1. China (33.9%)
2. United States (18.8%)
3. United Kingdom (11.6%)
4. Korea (7.3%)
5. Germany (4.5%)

Windows and Doors

Japan's imports of windows and doors from the U.S. fell during 2009 through 2014, posting -1.0% compound annual rate of growth. During the same timeframe, its overall subsector import market grew at a 3.5 percent rate. Windows and doors from the United States held a 2.9 percent share of Japan's import market in 2014, down from 3.6 percent in 2009. Windows and doors imported from Asian countries may also be Japanese brand products.

Top Import Sources and Market Share:

1. Thailand (2.2%)
2. China (33.1%)
3. Philippines (10.1%)
4. United States (2.9%)
5. Indonesia (2.9%)

Glass

Japan's imports of glass from the world fell sharply over 2009 to 2014, showing -13.8 percent compound annual growth. During the same period, the nation's imports from the U.S. grew at a rate of 1.1 percent. The United States is Japan's fifth largest source of

imported glass for construction, holding a 12.5 percent market share. This reflects growth in the United States position from 5.7 percent import market share in 2009. Three Japanese companies, Asahi Glass, Nippon Sheet Glass and Central Glass, dominate the Japanese flat glass market.

Top Import Sources and Market Share:

1. Taiwan (25.2%)
2. China (20.0%)
3. Korea (17.7%)
4. Germany (14.7%)
5. United States (12.5%)

Resources for U.S. Exporters

Please visit www.export.gov/japan for information from U.S. Commercial Service (CS) Japan, including

- Market research
- Trade events
- Trade leads
- Services available to U.S. companies
- Contact information for CS offices in Tokyo and the Osaka-Kobe area
- Info on subscribing to regular updates or connecting on social media
- Other information to assist U.S. exporters with Japan export market development

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Korea

U.S. building products in general enjoy duty-free market access in Korea under the Korea-U.S. Free Trade Agreement. The market is fiercely competitive, offering stable business practices, market-oriented policies and a democratic government. The Korean construction market is entering a period of growth, albeit modest, and reflects the national commitment to green building and strategic “smart” urban planning. Energy efficiency is a long-standing national objective. U.S. building product exporters may benefit from establishing an in-country presence or strong local partners in Korea.

Overall Rank 10	HVACR 11	Lighting 4	Plumbing Products 8
Wood Products 11	Insulation 5	Windows & Doors 11	Glass 58

Korea Construction Market

The Korean construction industry is expected to see growth in the range of 2.5 percent annually during 2015 to 2019,³⁸ following a five year downturn. Expansion is expected across residential, commercial and infrastructure segments. In the Korean market, residential construction is the largest segment. Government policies geared to stimulating the residential segment play a role in boosting this segment, as do urbanization trends. In other market segments, prospects are brightened by policies including the U-turn Company Support Law,³⁹ under which incentives and subsidies are deployed to Korean companies to bring back their manufacturing facilities from overseas. The country’s growing population and increase in tourism is expected to boost the retail segment of the market.

Korea imports an estimated 97 percent of its energy, and the building sector has long been an area of focus when seeking areas to reduce energy consumption. For decades Korea has emphasized the need to increase building performance to conserve resources.

Green Building in Korea

In 2001 the Korean Ministry of Land, Infrastructure and Transportation (MLIT) launched the Korea Green Building Certification (KGCB) rating and certification system. This certification is mandatory for residential, mixed-use dwellings, office buildings and schools.

Rating criteria include: land development and transportation, energy and resource consumption and environmental load, indoor environmental quality, ecological environment and other aspects including noise and acoustics, energy consumption, alternative energy use, grey water systems, sunlight in living areas, among others.

Looking beyond green building, the concept of smart cities has gained considerable focus in conjunction with Korea’s national policy of low carbon, green growth. The urban landscape throughout Korea reflects decades in which rapid industrialization and urbanization fueled uncontrolled urban expansion. In 2006 the Korean government embarked on its U-Korea Master Plan, a strategy for “ubiquitous development” under which the central government and regional and local government entities would focus on greener, more sustainable cities reflecting a convergence of the construction, ICT and service sectors.

Korea’s Building Regulatory System

The building regulatory system in Korea is highly structured and centralized under the Building Act, which is administered by the MLIT. Green features of buildings are introduced via the Building Act, which currently mandates specified levels of energy efficiency, construction waste recycling and reuse, and water efficiency standards for buildings. In addition, the Ministry of the Environment has

mandated standards for indoor air quality, storm water management and the environment.⁴⁰

Korean Standards (KS) are referenced by ordinances under the Ministry of Land, Transport and Maritime Affairs (MLTM). The Ministry also allows equivalent international standards in place of KS where applicable.

Challenges & Barriers to Sector Exports

U.S. building products enjoy strong brand recognition and a reputation for high quality in Korea. The types of barriers and challenges U.S. building product exporters face in Korea suggest a number of potentially productive ways USG agencies can assist to increase U.S. exports. The barriers noted below affect U.S. exporters across the seven subsectors. Engagement to increase U.S. companies' understanding of the Korean commercial environment and a focus on subsector-specific trade promotion and partner matchmaking is indicated.

Highly competitive market environment

While the KORUS FTA provides important market access advantages to U.S. exporters, the competitiveness of Korea's commercial environment should not be underestimated. The country stands in close proximity to lower-cost Asian producers of building products, has free trade agreements in place with China and Australia, and has access to global suppliers of the highest-quality building products.

While enjoying the tariff reduction benefits of KORUS, U.S. suppliers still must overcome transport costs and deliver on product performance and post-sales service requirements to compete in Korea. Winning sales often requires regular direct engagement with buyers to distinguish specific product performance from competitors. To provide needed sales follow-up support, U.S. exporters are well-served by an in-country presence.

Business customs

A capable in-country partner or local presence may be needed to help U.S. companies navigate the local markets to understand sales channels, the competitive state of play, applicable regulations and standards, as well as other aspects of the Korean commercial landscape. A key component of a Korea

market entry strategy is providing ongoing support to the local partner.

Regulatory environment

Detailed knowledge of the product standard and conformity assessment process is important to building product exporters, and providing access to relevant information would be meaningful to U.S. exporters.

Opportunities for U.S. Companies

Korea imported \$10.2 billion in HVACR, lighting, plumbing, wood products, insulation, windows and doors and glass from the world in 2014. This reflects a 6 percent compound annual growth rate of building product imports during 2009 through 2014. For the sector as a whole, the United States is the third largest source of Korea's imports with a 9.6 percent import market share.

Addressing the types of barriers described above may help U.S. exporters improve their share of Korea's market. This section provides a review of the current state of play and competitive landscape, suggesting where there may be the greatest room for growth.

Figure 28: Korea's Import Market

<i>Sector</i>	<i>Imports (2014, USD)</i>	<i>U.S. Rank as Import Source</i>	<i>U.S. Import Market Share</i>
HVACR	\$4.8 billion	3	13.3%
Lighting	\$985 mil.	4	7.0%
Plumbing	\$411 mil.	3	6.9%
Wood products	\$2.8 billion	7	5.9%
Insulation	\$196 mil.	2	22.2%
Windows & Doors	\$85 million	3	14.7%
Glass	\$878 mil.	6	1.8%

HVACR

Korea's imports of HVACR products grew at a compound annual growth rate of 9.1 percent over the 2009 to 2014 period. Products from the United States hold the second largest share of the Korean import market after China. Imports of HVACR products from the U.S. grew at a rate of 6.2 percent annually over the same timeframe, during which the import market share of U.S. products decreased to 13.3 percent in 2014 from 15.3 percent in 2009.

Top 5 Import Sources and Market Share:

1. China (22.2%)
2. Japan (13.4%)
3. United States (13.3%)
4. Germany (11%)
5. France (5.9%)

Lighting

Korea's imports of lighting grew at a rate of 2.3 percent annually during the 2009 to 2014 period, with imports of products from the U.S. growing at the higher rate of 9.1 percent during the same period. U.S.-sourced lighting products now have an import market share of 7 percent in Korea, after those sourced in China, Germany and Japan.

Top 5 Import Sources and Market Share:

1. China (49.6%)
2. Germany (14.8%)
3. Japan (11%)
4. United States (7%)
5. Norway (2.6%)

Plumbing Products

Plumbing products sourced in the U.S. hold a 6.9 percent share of Korea's import market, making it the third largest source of imports. The Korean plumbing product import market grew at a 5.7 percent compound annual growth rate during 2009 through 2014. The same period saw imports from the U.S. growing at a far higher rate of 22 percent annually.

Top 5 Import Sources and Market Share:

1. China (66.6%)
2. Japan (11.4%)
3. United States (6.9%)
4. Vietnam (2.6%)
5. Germany (2.4%)

Wood Products

The United States is the seventh largest source of wood products in Korea's import market. The country's imports of wood products grew at an 8.3 percent compound annual growth rate during 2009 through 2014, with imports from the U.S. decreasing at a -4.8 percent rate during the same period. U.S. product market share has decreased from 11.3 percent to 5.9 percent during that timeframe.

Top 5 Import Sources and Market Share:

1. China (19.3%)
2. New Zealand (13.6%)
3. Malaysia (9.7%)
4. Canada (7.9%)
5. Vietnam (7%)

Insulation

Korea's imports of insulation saw robust growth at a rate of 18.3 percent during 2009-2014, while imports from the United States showed even stronger growth at 21.8 percent annually during this timeframe. U.S. product import market share increased to 22.2 percent from its 19.2 percent level in 2009. Imports of products from China have grown dramatically during the same period.

Top 5 Import Sources and Market Share:

1. China (32.1%)
2. United States (22.2%)
3. Japan (13.9%)
4. Malaysia (8.8%)
5. Germany (6.2%)

Windows and Doors

Korea's imports of windows and doors grew at a 5.9 percent compound annual growth rate during 2009 through 2014, and imports of products from the U.S. grew at a like rate of 6 percent annually during the same period. U.S.-sourced products now hold the third largest share of Korea's window and door import market at 14.7 percent.

Top 5 Import Sources and Market Share:

1. China (28%)
2. Norway (20.7%)
3. United States (14.7%)
4. Indonesia (11.3%)
5. United Kingdom (5%)

Glass

Korea's imports of glass from the U.S. decreased at a rate of -2.2 percent annually during the 2009 to 2014 period as did the country's overall glass imports at a rate of -7.5 percent. U.S.-sourced glass imports hold the sixth largest import market share position in Korea.

Top 5 Import Sources and Market Share:

1. Japan (64.2%)
2. China (15.5%)
3. Taiwan (8.0%)
4. Indonesia (2.9%)
5. Saudi Arabia (2.8%)

Resources for U.S. Exporters

Please visit www.export.gov/southkorea for information from U.S. Commercial Service (CS) Korea, including

- Market research
- Trade events
- Trade leads
- Services available to U.S. companies
- Contact information for CS offices in Korea
- Info on subscribing to regular updates or connecting on social media
- Other information to assist U.S. exporters with Korea export market development

Mexico

Mexico ranks second among top markets for U.S. building product exporters. U.S. building products enter Mexico duty-free under NAFTA, and the construction market is highly receptive to U.S. products. Interest in green building continues to grow in Mexico. Near-term, leveraging subsector-specific trade promotion events, market intelligence and export financing may help expand the strong existing U.S. competitive position in Mexico. Increased transparency and a more aligned regulatory environment may expand longer-term U.S. market access to both traditional and green building opportunities.

Overall Rank 2	HVACR 2	Lighting 2	Plumbing Products 1
Wood Products 3	Insulation 1	Windows & Doors 2	Glass 3

U.S. manufacturers of HVACR, lighting, plumbing products, wood products, windows and doors and glass are highly competitive in Mexico, holding the leading import market share positions across the sector. U.S. building products enjoy a strong reputation for quality and reliability in Mexico, and traditionally have been well received by construction industry actors seeking to offer projects featuring higher quality materials and equipment.

Mexico Construction Market

Mexico's overall construction industry is projected to expand at a rate of 4.8 percent annually through 2018,⁴¹ just slightly higher than the growth rate from 2009 to 2014 driven by implementation of Mexico's National Infrastructure Plan and other policies. Looking forward, expansion of the leisure and hospitality building category is expected as Mexico works to expand its tourism sector. Government-led affordable housing projects also are expected to see continuing expansion through 2018. In terms of green building activity, the new commercial building segment is expected to see growth, together with existing building retrofits.

The Green Building Market in Mexico

The construction industry in Mexico has established a Green Building Council and has embraced green building in part as a means of establishing project

differentiation based on higher quality materials and equipment.

A recent industry survey conducted on construction industry stakeholders in Mexico suggested strong potential for green building product and service providers in the market.⁴² Respondents indicated that market demands, client demands, lower operating costs and higher return on investment (ROI) are key drivers of interest. Other survey findings of note include:

- The construction industry in Mexico is increasingly committed to green building. Within the coming three years, 44 percent of respondents indicated over 60 percent of their projects are expected to be green. This is more than double the current level of Mexican respondents currently at that level.
- Sixty-five percent of respondents indicated they will be doing work on new commercial buildings (office, retail, hotel) in the next three years.
- Forty-six percent of respondents reported they expect to do green retrofits of existing buildings within the next three years.
- One-third of respondents indicated they expect to work on green interior projects within the next three years.

Policies Supporting Green Building

Mexico recognizes buildings as the country's largest consumers of electricity and necessarily a key focal area in working to reduce greenhouse gas emissions. As such, Mexico is taking steps toward more environmentally friendly practices in the built environment and has shown interest in learning from the experiences of U.S., Canadian and other international best practices. Public policies aimed at increasing sustainable construction in Mexico have been concentrated in the housing sector. Such policies include incentives and subsidies for incorporating green technologies and establishment of voluntary and mandatory domestic standards for products and processes.

Standards

In Mexico, standards for products, systems and services include (i) Mexican Official Standards (NOM), which are *mandatory* federal government technical regulations that relate to health, safety and protection of the environment and consumer and (ii) Mexican Standards (NMX), *voluntary* standards for quality specifications of products, processes, systems and services.

In Mexico, only standards developed by the International Organization for Standardization (ISO), the International Electrotechnical Committee (IEC) and the International Telecommunications Union (ITU) are recognized as international standards, while those from other standards development organizations are considered foreign standards even if they meet the criteria of the World Trade Organization (WTO) Technical Barriers to Trade (TBT) Decision on Principles for the Development of International Standards. In addition to NOM and NMX, the Technical Suitability Report (DIT) is a commonly used set of process rules created on a product-specific basis.

Specific to buildings, multiple Mandatory Mexican Standards (NOM) exist for energy efficiency in the residential and commercial building envelope and for specific equipment and systems for lighting, appliances, HVACR, insulation and other building products. There is also a Mexican Voluntary Standard (NMX) for Sustainable Buildings, among other voluntary performance guidelines. In the realm of DITs in Mexico, there are product-specific guidelines for windows, glazing systems, thermal

resistance elements, roofs, tiles, water heaters and other building components.

Challenges & Barriers to Sector Exports

Highly competitive market environment

While U.S. building product manufacturers enjoy strong brand recognition and a reputation for reliability and quality in Mexico, they must be prepared to compete on price and product performance with leading global players. Growth of sales requires direct engagement with buyers in settings that permit detailed presentations of product technical specifications and performance attributes.

Traditional trade promotion activities (e.g., trade shows, trade missions, reverse trade missions, technical dialogues and exchanges) are effective, particularly for SME exporters. These events should be undertaken on a subsector-specific basis to ensure that U.S. exporters have focused engagement with Mexican buyers, allowing technical discussions on product performance capabilities and requirements.

Standards and conformity assessment

U.S. industry reports standards and conformity assessment issues (certification, inspection, sampling and testing, accreditation) as the largest non-tariff barriers to trade in the sector. These types of barriers, with inherent cost impacts, are burdensome for all exporters and have disproportionate impact on SMEs. The full suite of USG tools that can assist exporters with standards and conformance issues is detailed in the Executive Summary and Findings section of this report.

Mexico is conducting an overhaul of its standardization system, including consolidating standards development under a unified entity. The exact timetable and funding source for this consolidation remain unclear, and it is questionable whether Mexican authorities are realistic in their goal of this entity developing thousands of new standards within a short timeframe. Outside of the standards system restructuring, U.S. stakeholders report a general lack of transparency in engaging with the Mexican Bureau of Standards.

As mentioned above, Mexico currently recognizes only ISO, IEC, and ITU standards as “international standards” for mandatory requirements.

Capacity to expand green building

Mexico has shown strong interest in gaining policymaking and technical expertise from the international community.

Trans-Pacific Partnership

Mexico is a party to the Trans-Pacific Partnership (TPP) Agreement, a free trade agreement among the United States and 11 other countries that, after the agreement enters into force, will provide important market access benefits to U.S. exporters. Information about TPP benefits to U.S. building product exporters and other information on how TPP will make it easier to sell made-in-America products can be found at <http://trade.gov/fta/tpp/industries/building.asp>.

Know Your Buyer

For building product exports, the importance of specific sales channels and buyer categories varies depending on the target export market. In Mexico, ITA experience supporting U.S. building products exporters indicates the following assignment of priority among relevant sales channels:

Figure 29:

<u>Sales Channels</u>	Low	Priority Medium	High
Government entities	X		
Architects		X	
Design and build companies		X	
Trade contractors		X	
Building facility managers			X
Distributors			X
Showroom dealers		X	
Retailers	X		
Other	X		

Opportunities for U.S. Companies

Mexico imported \$12 billion in building products in 2014, reflecting an 11 percent compound annual growth rate over the preceding five years. For the sector as a whole and for every subsector within the group, the United States is currently the leading source of Mexico’s imports, claiming 53 percent of the Mexican import market. A look at each of the

subsectors provides a more informed perspective on the U.S. competitive position.

Figure 30: Mexico's Import Market

<i>Sector</i>	<i>Imports (2014, USD)</i>	<i>U.S. Rank as Import Source</i>	<i>U.S. Import Market Share</i>
HVACR	\$7.4 billion	1	55.3%
Lighting	\$1.6 billion	1	43.7%
Plumbing	\$805 million	1	54.9%
Wood products	\$1.6 billion	1	42.6%
Insulation	\$346 million	1	72.7%
Windows & Doors	\$108 million	1	65.8%
Glass	\$109 million	1	71.7%

HVACR

Mexico’s imports of HVACR products from the world grew at a compound annual growth rate of 13.1 percent during 2009 through 2014, and its imports of these products from the United States grew at 12.6 percent during the same period. The United States’ share of Mexico’s HVACR import market fell slightly to 55.3 percent in 2014 from 56.5 percent in 2009. The import market share of HVACR products from China grew nearly 4 percent during the same period.

Top Import Sources and Market Share:

1. United States (55.3%)
2. China (17.2%)
3. Korea (4.3%)
4. Germany (4.1%)
5. Japan (3.8%)

Lighting

Mexico’s imports of lighting from the world grew at a 10.5 percent compound annual growth rate during 2009 through 2014. Its imports of lighting from the United States grew at 9.5 percent annually during the same period. The United States’ share of Mexico’s lighting import market decreased slightly to 43.7 percent in 2014 from 45.6 percent in 2009. Imports of lighting from China grew substantially

during these five years as did its product import market share.

Top Import Sources and Market Share:

1. United States (43.7%)
2. China (32.1%)
3. Germany (6.7%)
4. Japan (3.6%)
5. Korea (2.1%)

Plumbing

Mexico's imports of plumbing products from the world grew at a compound annual growth rate of 4.6 percent during 2009 through 2014, and its imports of these products from the United States grew at a modest 0.7 percent annually during the same period. The United States' share of Mexico's plumbing product import market fell from 66.4 percent in 2009 to 54.9 percent in 2014.

Top Import Sources and Market Share:

1. United States (54.9%)
2. China (19.5%)
3. Malaysia (4.7%)
4. Germany (3.2%)
5. Japan (3.1%)

Wood

Mexico's imports of wood products from the world grew at a compound annual growth rate of 8 percent during 2009 through 2014, and its imports of wood products from the United States grew at 9.7 percent annually during the same period. The United States' share of Mexico's wood product import market grew to 42.6 percent in 2014 from 39.4 percent in 2009.

Top Import Sources and Market Share:

1. United States (42.6%)
2. Chile (15.2%)
3. China (9.4%)
4. Brazil (5.7%)
5. Canada (3.6%)

Insulation

Mexico's imports of insulation from the world grew at a compound annual growth rate of 16.7 percent during 2009 through 2014, and its imports of these products from the United States grew at 15.9 percent annually during the same period. The United States' share of Mexico's insulation import market

fell slightly to 72.7 percent in 2014 from 75.2 percent in 2009. China increased its product market share from 3 percent to 11 percent during the same period.

Top Import Sources and Market Share:

1. United States (72.7%)
2. China (11.0%)
3. Japan (3.1%)
4. Canada (2.3%)
5. United Kingdom (2.0%)

Windows and Doors

Mexico's imports of windows and doors from the world grew at a compound annual growth rate of 5.7 percent during 2009 through 2014, and its imports of these products from the United States grew on par at 5.7 percent annually during the same period. The United States' share of Mexico's window and door import market held firm at just over 65 percent between 2009 and 2014.

Top Import Sources and Market Share:

1. United States (65.8%)
2. China (12.3%)
3. Canada (6.0%)
4. Italy (4.6%)
5. Spain (4.4%)

Glass

Mexico's imports of glass from the world grew at a compound annual growth rate of 10.3 percent during 2009 through 2014. Its imports of these glass from the United States grew at 7.8 percent annually during the same period. The United States' share of Mexico's glass import market to fell to 71.7 percent in 2014 from 80.1 percent in 2009.

Top Import Sources and Market Share:

1. United States (71.7%)
2. China (12.2%)
3. Germany (4.1%)
4. France (2.6%)
5. Romania (1.9%)

Resources for U.S. Exporters

Please visit www.export.gov/mexico for information from U.S. Commercial Service (CS) Mexico, including

- Market research
- Trade events
- Trade leads
- Services available to U.S. companies
- Contact information for CS offices in Mexico City, Monterrey, and Guadalajara
- Info on subscribing to regular updates or connecting on social media
- Other information to assist U.S. exporters with Mexico export market development

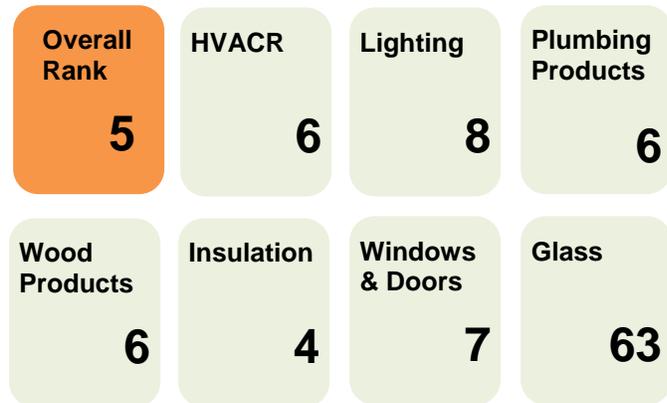
Upcoming Building Sector Trade Events for U.S. Exporters Interested in Mexico

- Expo Cihac
October 11-15, 2016
Centro Banamex, Mexico City, Mexico
<http://www.expocihac.com/en>
- Expo Nacional Ferretera
September 8-10, 2016
Expo Guadalajara, Guadalajara, Mexico
<http://www.expoferretera.com.mx/en/>
- SAIE Mexico
February 20-23, 2017
Centro Bancomer, Mexico City, Mexico
<http://www.saiemexico.com.mx/>

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United Kingdom

Green building is well established in the United Kingdom (UK) and is embraced by government and private industry alike. The UK construction market is growing, and boosting sustainable construction is a core component of the UK's strategy to address climate change. U.S. building products enjoy a strong reputation for quality and reliability in the UK, while import tariffs and regulatory requirements pose challenges. Conducting sales promotion at focused trade events may boost the competitive position of U.S. building product exporters in traditional and green building markets.



UK Construction Market

The UK construction market is expected to show moderate growth through 2018, as investments flow under the National Infrastructure Plan⁴³ and a period of policy continuity ensues after the 2015 elections. The largest section of the UK construction market is residential construction at 40 percent of market value. This segment is expected to maintain its share in a growth environment, based in part on government initiatives to alleviate the shortage of housing units. The second largest market segment, commercial construction at 26 percent of the market, also is expected to see continuing growth, driven by increases in consumer spending and business investments with growing demand for office space.

Green Building in the United Kingdom

Green building has a well-established history in the UK and is embraced by both the public and private sectors. The voluntary Building Research Establishment Environmental Assessment Method (BREEAM) system for rating the sustainability of non-residential building designs arose two decades ago, and although BREEAM is a voluntary scheme, the majority of local planning authorities require that new buildings in the UK are certified and achieve high BREEAM ratings.

More recently, public policies have placed sustainable construction at the heart of the UK's efforts to address climate change and reduce greenhouse gas emissions 80 percent by 2050. The 2011 UK Carbon Plan acknowledges that improving energy efficiency across sectors will be required to achieve national goals.

The UK industry has embraced sustainable construction. A recent industry survey of construction stakeholders in the UK showed a 14 percent gain in the number of companies that expect to do more than 60 percent of their projects in green projects by 2018.⁴⁴ Interestingly, the same survey also showed a small enduring segment of the industry that currently do no green projects and do not envision doing green projects by 2018. To move this small segment of the industry may require new types of measures or incentives.

The top sectors in which respondents in the above mentioned survey plan to do green projects by 2018 include:

- Retrofits of existing buildings (44%)
- New low-rise residential buildings (40%)
- New institutional buildings (37%)

Specific initiatives within the policy environment surrounding green building continue to evolve. In 2015, the new UK government eliminated the Green

Deal policy, as it had failed to deliver its objectives, along with the Zero Carbon Homes policy, to reduce net regulations on house builders. Still, the current Home Energy Efficiency Scheme stays rigorous and requires high green standards from building products. The government will heavily support building of new homes in 2016 through 2017, which is expected to further increase UK construction activity, as above noted.

In support of intelligent buildings, smart meters will be rolled out as standard across the country by 2020. The UK government also is working to advance building performance from a perspective of resilience. By 2021, the UK government has pledged to spend £2.3 billion for over 1,500 flood defense schemes across the country.

UK and EU Regulations Affecting Building Product Exporters

The UK is a member state of the European Union (EU), and building products tested and certified in the United States to American standards typically need to be re-tested and re-certified to EU requirements. The EU Construction Product Regulation underpins trade in construction products, and U.S. building product exporters must comply with its requirements in order to export to the UK market. As an EU member, the UK is currently implementing the EU's Procurement Directives. These have been developed to provide for fair, transparent and competitive procurement across the member states. The first of the UK's implementing regulations, the Public Contracts Regulations 2015,⁴⁵ took effect on February 26, 2015.

EU Construction Product Regulation (CPR)

The CPR establishes harmonized rules for the marketing of construction products in the EU and provides a common technical language to assess the performance of construction products. It is relevant to any construction product covered by a European harmonized standard or for which a European Technical Assessment has been issued. Complying with the CPR involves a multi-step process, including establishing an EU Declaration of Conformity for the product and affixing the CE marking to a product.

In June 2016, there will be a referendum in the UK to decide whether the UK will remain a member state of the EU or leave the EU. The outcome of this

"Brexit referendum" and its impacts remain uncertain. If the UK elects to leave the EU, it is unclear what will occur with respect to EU regulations that have been adopted in the UK.

Challenges & Barriers to Sector Exports

U.S. building products enjoy strong brand recognition and a reputation for high quality in the UK, but challenges remain for expansion of the U.S. building product's competitive position. Below, commonly experienced barriers to building product exports are summarized. The challenges common to all building product exporters suggest a focus on subsector specific trade promotion targeted to highlight product performance attributes and that buyer matchmaking is essential. At the same time, engagement to improve exporters' understanding of the local regulatory and business environment can be crucial.

Tariffs

U.S. products compete well in the UK in the current WTO tariff environment, but tariffs place a burden on U.S. exporters compared with products that enter the UK duty-free, such as those from EU member states.

Highly competitive market environment

The UK has close proximity to European producers of high-quality building products, as well as access to global suppliers of competitively priced building products. U.S. suppliers must overcome transport costs and deliver on product performance and post-sales service requirements to compete in the UK. Winning sales often requires regular direct engagement with buyers to distinguish specific product performance versus that of competitors.

Regulatory environment – UK and EU regulations

Exporters may experience complexity in determining which EU regulations apply to their products on top of any UK requirements. As noted above, the EU Construction Products Regulation and associated Declaration of Performance and CE marking requirements are among the most important EU regulations affecting this sector.

Detailed knowledge of the product standard and conformity assessment process is important to all

building product exporters. Uncertainty about the outcome of the June 2016 “Brexit referendum” adds complexity to the regulatory arena.

Business customs

The commonality of the English language does not translate to an instantly understandable business environment in the United Kingdom.

Know Your Buyer

As the UK is a mature and sophisticated market, U.S. companies are recommended to build a local presence through local business contacts and partners. Many companies also choose to become a member of one or more relevant industry associations in the UK. These often lobby on behalf of the companies with the government and also provide networking opportunities.

Overall, ITA’s experience supporting U.S. building products exporters in the UK indicates the following assignment of priority among relevant sales channels:

Figure 31: <u>Sales Channels</u>	<u>Priority</u>		
	Low	Medium	High
Government entities	X		
Architects			X
Design and build companies			X
Trade contractors			X
Building facility managers		X	
Distributors			X
Showroom dealers		X	
Retailers		X	
Other	X		

Opportunities for U.S. Companies

The UK imported \$17.7 billion in building products from the world in 2014. Tackling the above types of barriers with the tools named may help U.S. exports increase their position in the UK’s import market for building products. For the sector as a whole, the United States is currently the third largest source of the UK’s imports, claiming 6.5 percent of the market after products from Germany and China. A look at each of the subsectors provides a more informed perspective on the U.S. competitive position.

Figure 32: UK’s Import Market

<i>Sector</i>	<i>Imports (2014, USD)</i>	<i>U.S. Rank as Import Source</i>	<i>U.S. Import Market Share</i>
HVACR	\$7.1 billion	2	10.7%
Lighting	\$2.5 billion	7	3.3%
Plumbing	\$1.4 billion	14	1.7%
Wood products	\$5.3 billion	7	3.3%
Insulation	\$286 mil.	1	27.0%
Windows & Doors	\$926 mil.	17	1.4%
Glass	\$154 mil.	5	7.0%

HVACR

U.S. HVACR products are highly competitive in the UK, holding the second largest share of the import market after Germany. The UK’s HVACR imports from the world grew at a compound annual growth rate of 6.7 percent during 2009 to 2014, while its imports of subsector products from the United States grew 9.3 percent annually during the same period. U.S. market share was slightly higher in 2014 at 10.7 percent in comparison to 9.5 percent in 2009.

Top 5 Import Sources and Market Share:

1. Germany (17.8%)
2. United States (10.7%)
3. Italy (10%)
4. France (7.7%)
5. China (6.6%)

Lighting

In the lighting subsector, while the UK import market grew at a rate of nearly 9 percent annually from 2009 to 2014, U.S. products fare relatively poorly. The import market is dominated by China, with nearly 37 percent market share, as well as European rivals. While lighting imports from the U.S. grew at a compound annual growth rate of 4.3 percent during 2009 to 2014, market share has declined slightly to 3.3 percent.

Top 5 Import Sources and Market Share:

1. China (38.5%)
2. Germany (9.8%)
3. France (6.5%)
4. Netherlands (5.9%)
5. Italy (4.7%)

Plumbing

U.S. products claim a modest 1.7 percent share of the UK plumbing import market and rank 14th in terms of overall competitive position.

Top 5 Import Sources and Market Share:

1. Germany (23%)
2. China (19.8%)
3. Italy (6.7%)
4. Greece (5.3%)
5. France (4.4%)

Wood

The \$5.3 billion UK wood product import market has been growing steadily, posting nearly 14 percent compound annual growth during 2009 to 2014. Wood products from the United States claim a modest 3.3 percent of the UK's import market, growing at a rate of just 1.8 percent during the same five year period.

Top 5 Import Sources and Market Share:

1. Sweden (17.6%)
2. China (13%)
3. Germany (9.7%)
4. Ireland (7.1%)
5. Finland (6.8%)

Insulation

U.S. insulation products are strongly competitive in the UK. Insulation imports from the United States have grown at an impressive 26 percent compound

annual growth rate during 2009 to 2014, claiming the leading share of the subsector import market at 26.8 percent. The U.S. product share has more than doubled since 2009, rising to 27 percent from just under 12 percent in five years.

Top 5 Import Sources and Market Share:

1. United States (28.8%)
2. Germany (20.5%)
3. Netherlands (8.9%)
4. Belgium (7.9%)
5. France (6.2%)

Windows and Doors

Ranked 17th as an import source, U.S. windows and doors claim only 1.4 percent of the UK's import market for subsector products.

Top 5 Import Sources and Market Share:

1. Poland (18.6%)
2. China (10.5%)
3. Germany (8.9%)
4. Indonesia (7.9%)
5. Ireland (7.7%)

Glass

The UK's glass import market decreased at a rate of -1.9 percent during the 2009 to 2014 period. The United States is the fifth largest source of glass imports in the UK, and glass products shipped from the United States claim a 7 percent share of the import market. U.S. market share in 2014 was down to 7 percent from 8.8 percent in 2009.

Top 5 Import Sources and Market Share:

1. German (25.4%)
2. Belgium (12.1%)
3. China (8.7%)
4. France (7.3%)
5. United States (7.0%)

Resources for U.S. Exporters

Please visit www.export.gov/unitedkingdom for information from U.S. Commercial Service (CS) United Kingdom, including

- Market research
- Trade events
- Trade leads
- Services available to U.S. companies
- Contact information for CS staff members in London
- Info on subscribing to regular updates or connecting on social media
- Other information to assist U.S. exporters with United Kingdom export market development

Upcoming Building Sector Trade Events for U.S. Exporters Interested in the United Kingdom

- Homebuilding and Renovating Show 2016 - <http://www.homebuildingshow.co.uk/>
- UK Construction Week 2016 - <http://www.ukconstructionweek.com/>
- Ecobuild 2017 - <http://www.ecobuild.co.uk>

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Vietnam

Vietnam is a dynamic economy projected to maintain strong GDP growth over the coming decade. Increasing urbanization and industrialization, together with infusions of foreign investment, have unleashed new opportunity in the building sector. A focus on energy and water efficiency, indoor air quality and other green performance goals support growing opportunities for building product manufacturers. U.S. exporters are encouraged to visit and assess the market and to establish a market presence to support sales.

Overall Rank	HVACR	Lighting	Plumbing Products
18	50	42	64
Wood Products	Insulation	Windows & Doors	Glass
5	40	59	17

The construction sector in Vietnam is staging a solid recovery following the 2011 to 2012 property market bubble collapse. Strong inflows of foreign direct investment (FDI), rapid urbanization and a growing middle class among Vietnam's 93 million population has contributed to increasing demand for new and higher performing building products.

Key trends impacting Vietnam's construction market provide advantages to U.S. building product manufacturers recognized for top quality, high performance products. Large segments of the country's property market are dominated by foreign developers eager to distinguish their properties. To maintain reputations for high quality, these developers demand advanced building technologies and products reflecting the latest innovations and styles. Specific prospects for U.S. building product exporters include high-end hotels and resort properties, as well as high-rise office towers and mixed-use projects.

In addition, FDI flows into Vietnam's manufacturing sector have grown over the past decade. The number of foreign manufacturers moving to establish production facilities in Vietnam means ongoing demand for industrial properties and parks, warehouses and logistics facilities. All of these property types require products of high reliability and durability.

Green Growth Strategy

In 2012, the Vietnam government adopted the Vietnam National Green Growth Strategy (VNGGS), which was mainly aimed at reducing energy consumption and greenhouse gas (GHG) emissions linked to economic activity and boosting "green" economic sectors. The VNGGS is structured around three strategic tasks:

- Reducing GHG emissions and promoting the use of clean and renewable energy. After 2020, the target is to decouple economic growth from GHG emissions.
- Greening production based on i) implementing a clean industrialization strategy via adjusted sector master plans, (ii) development of green industry and agriculture technologies and equipment, (iii) investment in natural capital and (iv) prevention and treatment of pollution
- Greening lifestyle, where traditional lifestyle is combined with means to create quality and traditionally rooted living standards, including the creation of green jobs. New consumption modes should mean environmental benefits counterbalance increased consumption.

Green Building in Vietnam

The VNGGS acknowledges the importance of buildings and the construction industry. Increasing the energy efficiency of its buildings is a long-

standing goal in Vietnam and is reflected in its existing building code. Mandatory code requirements include requirements to achieve desired indoor air quality levels.

Vietnam's Ministry of Construction has developed a green building strategy with a vision to 2030 that includes criteria on energy and fresh water savings in construction, as well as operation standards to rate green and energy efficient projects.

The Vietnam Green Building Council operates the voluntary LOTUS building rating system that covers nine categories of building performance: energy, water, materials, waste, ecology, waste and pollution, health and comfort, adaptation and mitigation, community and management. LOTUS also includes an innovation category carrying extra credits for areas of exceptional performance.

Vietnam takes a central government-led approach to its building and construction regulatory system. There are four levels of reference standards relevant to the sector: (1) national standards and national and local technical standards administered by the Vietnam Standards and Quality Institute; (2) construction standards administered by the Ministry of Construction; (3) standards administered by the central government; and (4) international codes and standards, which can replace any Vietnam Standard or be used where there is no applicable Vietnam Standard.

Vietnam is taking a specific interest in adopting standards geared to increasing energy efficiency in its building regulatory system. Opportunities may exist for private sector entities in the U.S. to weigh in on this process. U.S. entities can sign up for notifications from National Institute of Standards and Technology (NIST) on standards development in target markets. Interested exporters may find additional information at <https://tsapps.nist.gov/notifyus/data/index/index.cfm>.

Challenges & Barriers to Building Products Exports

U.S. building products enjoy strong brand recognition and a reputation for high quality in Vietnam. The types of challenges U.S. building product exporters face in Vietnam include but are not limited to:

Tariffs

Import duties on U.S. building products can impede U.S. competitiveness in Vietnam.

Trans-Pacific Partnership

Vietnam is a party to the Trans Pacific Partnership (TPP) Agreement, a free trade agreement among the United States and 11 other countries that, when it enters into force, will provide important market access benefits to U.S. exporters. Information about TPP benefits to U.S. building product exporters and other information on how TPP will make it easier to sell made-in-America products can be found at <http://trade.gov/fta/tpp/industries/building.asp>.

Highly competitive market environment

Vietnam has access to lower-cost competitors as well as global suppliers of the highest-quality building products. U.S. suppliers must overcome U.S.-to-Vietnam transport costs and deliver on product performance and post-sales service requirements to compete in Vietnam. Winning sales often requires regular direct engagement over time with buyers to distinguish themselves from their competitors in terms of their products' performance and their company's sales support assurances. To provide needed buyer engagement and after-sales follow-up support, U.S. exporters are well-served by an in-country presence or by effective local partners.

Regulatory environment

Overall, the regulatory regime and commercial law environment in Vietnam is best described as evolving. U.S. companies often report a lack of transparency and consistency in governmental decisions and policies. Detailed knowledge of the product standard and conformity assessment process for construction products is important to U.S. building product exporters.

Geographic Diversity

There are considerable differences in key buyer constituencies between Vietnam's northern region, where government and regulatory agencies exist in higher density, and its southern region, which is more of a commercial hub. U.S. exporters should customize selection of trade promotion

opportunities and marketing approaches based on the region in which they plan to operate.

Business customs

A capable in-country partner may be needed to help U.S. companies navigate the local markets to understand sales channels, the competitive state of play, applicable regulations and standards, as well as other aspects of the Vietnam commercial landscape, such as administrative red tape.

Know Your Buyer

In Vietnam, ITA’s experience supporting U.S. building products exporters indicates the following assignment of priority among relevant sales channels:

Figure 33:

<u>Sales Channels</u>	Low	Priority Medium	High
Government entities	X		
Architects		X	
Design and build companies		X	
Trade contractors			X
Building facility managers			X
Distributors			X
Showroom dealers		X	X
Retailers		X	X

There are hundreds of local trading building and construction materials companies of different sizes in Vietnam. These companies are in charge of sourcing the materials when they receive purchase orders from customers (investors or construction companies). If they cannot find appropriate local materials, they will source from overseas manufacturers and suppliers. This is usually the case for large or special materials purchases. These trading companies handle the ordering of the materials, the entire shipping process and the delivery of the materials to the sites.

Opportunities for U.S. Companies

In order to be successful in the Vietnamese market, U.S. suppliers are highly encouraged to visit the market and spend time assessing market needs, sales potential and possible distributors for their products. It is important to conduct an analysis of the market prior to entry.

Exporters also should establish a local presence. Prospective U.S. exporters should maintain contact with local partners and their counterparts. It is essential to conduct due diligence over potential partners, including their import licenses and financial capabilities.

Organizing seminars on products and technologies for potential end-users is the key to building brand recognition in the market. Providing technical support to the local partner also is an important signal of commitment to the market.

The U.S. Foreign Commercial Service can assist with activities ranging from market and company intelligence to partner matchmaking and advocacy. Contact information is provided below.

Vietnam’s Import Market

Vietnam imported \$4.6 billion in HVACR, lighting, plumbing, wood products, insulation, windows and doors and glass from the world in 2014. From 2009 to 2014, the building products sector grew 17.6 percent. The United States is the fifth largest source of Vietnam’s building products imports with a 7 percent market share. From 2009 to 2014, building products imports from the U.S. grew at an annual rate of 15.4 percent.

The chart below provides an overview of country market share positions in Vietnam’s import market for building products. This may suggest areas in which U.S. exporters have the greatest room for growth.

Figure 34: Vietnam's Import Market

<i>Sector</i>	<i>Imports (2014, USD)</i>	<i>U.S. Rank as Import Source</i>	<i>U.S. Import Market Share</i>
HVACR	\$1.5 billion	10	2.7%
Lighting	\$389 million	7	1.8%
Plumbing	\$268 million	9	0.8%
Wood products	\$2.1 billion	2	12.0%
Insulation	\$91 million	8	1.9%
Windows & Doors	\$59 million	19	0.1%
Glass	\$145 million	4	6.5%

HVACR

Vietnam's imports of HVACR products grew at a compound annual growth rate of 11.9 percent over 2009 to 2014. Imports of HVACR products from the U.S. grew at a rate of just 1.2 percent annually over the same timeframe, during which the import market share of U.S. products decreased from 4.4 percent to the 2014 level of 2.7 percent.

Top 5 Import Sources and Market Share:

1. China (26.5%)
2. Thailand (24.5%)
3. Korea (10.5%)
4. Malaysia (8%)
5. Japan (6.3%)

Lighting

Vietnam's imports of lighting more than tripled during the 2009 to 2014 period, growing at a compound annual growth rate of 28 percent. Imports of lighting products from the U.S. declined at a rate of 7.7 percent during the same period. U.S.-sourced lighting products now have an import market share of 1.8 percent.

Top 5 Import Sources and Market Share:

1. China (43.6%)
2. Korea (30.1%)
3. Japan (5.7%)
4. Germany (4.3%)
5. Taiwan (2.5%)

Plumbing Products

Plumbing products sourced in the U.S. hold less than a 1 percent share of Vietnam's import market and are the ninth largest source of the country's imports. The Vietnam plumbing product import market grew at a healthy 17.4 percent compound annual growth rate during 2009 to 2014. The same period saw imports from the U.S. growing at 11.5 percent.

Top 5 Import Sources and Market Share:

1. China (36.7%)
2. Korea (15.5%)
3. Japan (13.1%)
4. Thailand (12.1%)
5. Taiwan (9.5%)

Wood Products

The United States is the second largest source of wood products in Vietnam's import market, behind Laos. The country's imports of wood products grew at a 19.6 percent compound annual growth rate during 2009 through 2014, with imports from the U.S. increasing at a rate of 20.1 percent during the same period. U.S. product market share has increased slightly from 11.8 percent to 12 percent during that timeframe.

Top 5 Import Sources and Market Share:

1. Laos (27.5%)
2. United States (12%)
3. Cambodia (11.8%)
4. China (9.7%)
5. Malaysia (5%)

Insulation

Vietnam's imports of insulation saw strong growth during 2009 through 2014 at a rate of 28 percent annually. The country's imports from the United States grew at a rate of 14.3 percent during the same period. U.S. product import market share is down to 1.9 percent from its 3.3 percent level in 2009.

Top 5 Import Sources and Market Share:

1. China (46%)
2. Japan (17.4%)
3. Korea (15.5%)
4. Thailand (5.7%)
5. India (2.6%)

Windows and Doors

Vietnam's imports of windows and doors grew at a robust 26 percent compound annual growth rate during 2009 through 2014, while imports of windows and doors from the U.S. decreased dramatically at a rate of 40 percent annually during the same period. U.S.-sourced products now hold just a 0.13 percent share of Vietnam's window and door import market.

Top 5 Import Sources and Market Share:

1. Korea (55.2%)
2. China (24%)
3. Japan (2.7%)
4. Netherlands (2.5%)
5. Malaysia (2.3%)

Glass

Vietnam's imports of glass from the world grew at a healthy 27 percent rate annually over 2009 to 2014. Its imports from the U.S. grew at an astonishing 47% compound annual growth rate during that period. U.S.-sourced glass imports hold the fourth largest import market share position in Vietnam, behind Japan, China and Taiwan.

Top 5 Import Sources and Market Share:

1. Japan (32.3%)
2. China (27.3%)
3. Taiwan (12.5%)
4. United States (6.5%)
5. Hong Kong (5.9%)

Resources for U.S. Exporters

Please visit www.export.gov/vietnam for information including

- Market research
- Trade events
- Services available to U.S. companies
- Contact information for our offices in Hanoi and Ho Chi Minh City
- and much more!

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Addendum: Resources for U.S. Exporters

The U.S. Government has numerous resources available to help U.S. exporters: from additional market research, to guides to export financing, to overseas trade missions, to staff around the country and the world. A few key resources are highlighted below. For additional information about services from the International Trade Administration (ITA), please visit www.export.gov.

Country Commercial Guides

<http://export.gov/ccg/>

Written by U.S. Embassy trade experts worldwide, the *Country Commercial Guides* provide an excellent starting point for what you need to know about exporting and doing business in a foreign market. The reports include sections addressing: market overview, challenges, opportunities, and entry strategies; political environment; selling U.S. products and services; trade regulations, customs, and standards; and much more.

Basic Guide to Exporting

<http://export.gov/basicguide/>

A Basic Guide to Exporting addresses virtually every issue a company looking to export might face. Numerous sections, charts, lists and definitions throughout the book's 19 chapters provide in-depth information and solid advice about the key activities and issues relevant to any prospective exporter.

Trade Finance Guide: A Quick Reference for U.S. Exporters

<http://www.export.gov/tradefinanceguide/index.asp>

Trade Finance Guide: A Quick Reference for U.S. Exporters is designed to help U.S. companies, especially small and medium-sized enterprises, learn the basics of trade finance so that they can turn their export opportunities into actual sales and achieve the ultimate goal of getting paid on time for those sales. Concise, two-page chapters offer the basics of numerous financing techniques, from open accounts to forfaiting and government assisted foreign-buyer financing.

Trade Missions

<http://www.export.gov/trademissions/>

Department of Commerce trade missions are overseas programs for U.S. firms that wish to explore and pursue export opportunities by meeting directly with potential clients in local markets.

Trade missions include, among other activities, one-on-one meetings with foreign industry executives

and government officials that are pre-screened to match specific business objectives.

Select Upcoming Trade Missions

- Fall 2016 China Softwood Lumber Trade Mission
November 14 – 18, 2016
Market Development Cooperator Program with Evergreen Building Products Association
http://www.ep.org/en/programs/china_events/506
- Fall 2016 Japan Building Materials Trade Mission
September 12 - 16, 2016
Market Development Cooperator Program with Evergreen Building Products Association
http://www.ep.org/en/programs/japan_events/505

Certified Trade Fairs

http://www.export.gov/eac/show_short_trade_events.asp?CountryName=null&StateName=null&IndustryName=null&TypeName=International%20Trade%20Fair&StartDate=null&EndDate=null

The Department of Commerce's trade fair certification program endorses overseas trade shows that are reliable venues and good markets for U.S. firms to sell their products and services abroad. These shows serve as vital access vehicles for U.S. firms to enter and expand into foreign markets. The certified show/U.S. pavilion ensures a high-quality, multi-faceted opportunity for American companies to successfully market overseas. Among other benefits, certified trade fairs provide U.S. exhibitors with help facilitating contacts, market information, counseling and other services to enhance their marketing efforts.

International Buyer Program

<http://export.gov/ibp/>

The International Buyer Program (IBP) brings thousands of international buyers to the United States for business-to-business matchmaking with U.S. firms exhibiting at major industry trade shows. Every year, the International Buyer Program results in millions of dollars in new business for U.S. companies by bringing pre-screened international buyers, representatives and distributors to selected shows. U.S. country and industry experts are on site at IBP shows to provide hands-on export counseling, market analysis, and matchmaking services. Each IBP show also has an International Business Center where U.S. companies can meet privately with prospective international buyers, prospective sales representatives, and business partners and obtain assistance from experienced ITA staff.

The Advocacy Center

<http://www.export.gov/advocacy/>

The Advocacy Center coordinates U.S. government interagency advocacy efforts on behalf of U.S. exporters that are bidding on public-sector contracts with overseas governments and government agencies. The Advocacy Center helps to ensure that sales of U.S. products and services have the best possible chance competing abroad. Advocacy assistance is wide and varied but often involves companies that want the U.S. Government to communicate a message to foreign governments or government-owned corporations on behalf of their commercial interest, typically in a competitive bid contest.

ITA Global Design & Construction Team

www.export.gov/industry/construction

The Global Design & Construction Team centralizes industry expertise, market research and best practices to better assist U.S. manufacturers of construction and building products, design firms and service providers with international expansion. The Team is comprised of trade specialists drawn from ITA's 100 U.S. and 70 overseas locations.

For more information, visit:

To obtain trade leads:

<https://www.linkedin.com/groups?home=&gid=4979345&trk=anet ug hm&goback=%2Egna 4979345>

U.S. Commercial Service

<http://www.export.gov/usoffices/index.asp>

With offices throughout the United States and in U.S. Embassies and consulates in nearly 80 countries, the U.S. Commercial Service utilizes its global network of trade professionals to connect U.S. companies with international buyers worldwide. Whether looking to make their first export sale or expand to additional international markets, companies will find the expertise they need to tap into lucrative opportunities and increase their bottom line. This includes trade counseling, actionable market intelligence, business matchmaking, and commercial diplomacy.

Appendix 1: Countries Included in the 2018 Rankings

Countries, in alphabetical order

Angola	Korea
Argentina	Kuwait
Australia	Lebanon
Austria	Macao
Bahamas	Malaysia
Bahrain	Mexico
Barbados	Netherlands
Belgium	New Zealand
Bermuda	Nicaragua
Bolivia	Nigeria
Brazil	Norway
Canada	Oman
Cayman Islands	Pakistan
Chile	Panama
China	Peru
Colombia	Philippines
Costa Rica	Poland
Czech Republic	Portugal
Denmark	Qatar
Dominican Republic	Republic of South Africa
Ecuador	Russia
Egypt	Saudi Arabia
El Salvador	Singapore
Finland	Spain
France	Sweden
Germany	Switzerland
Ghana	Taiwan
Guatemala	Thailand
Haiti	Trinidad and Tobago
Honduras	Turkey
Hong Kong	United Arab Emirates
Hungary	United Kingdom
India	Venezuela
Indonesia	Vietnam
Iraq	
Ireland	
Israel	
Italy	
Jamaica	
Japan	
Jordan	

Appendix 2: 2018 Building Product Export Market Rankings (All Subsectors Combined)

Ranked in order of U.S. dollar value of projected annual exports, highest to lowest

- | | |
|------------------------------|--------------------|
| 1. Canada | 40. Qatar |
| 2. Mexico | 41. Argentina |
| 3. China | 42. Kuwait |
| 4. Japan | 43. Iraq |
| 5. United Kingdom | 44. Israel |
| 6. Saudi Arabia | 45. Ireland |
| 7. Germany | 46. Sweden |
| 8. Australia | 47. Costa Rica |
| 9. Hong Kong | 48. Nigeria |
| 10. Korea | 49. Jamaica |
| 11. Brazil | 50. Hungary |
| 12. France | 51. Oman |
| 13. United Arab Emirates | 52. Guatemala |
| 14. Singapore | 53. New Zealand |
| 15. Netherlands | 54. Bolivia |
| 16. Russia | 55. Czech Republic |
| 17. Italy | 56. Angola |
| 18. Vietnam | 57. Cayman Islands |
| 19. Taiwan | 58. Honduras |
| 20. India | 59. Denmark |
| 21. Belgium | 60. Switzerland |
| 22. Venezuela | 61. Norway |
| 23. Colombia | 62. Bahrain |
| 24. Turkey | 63. El Salvador |
| 25. Dominican Republic | 64. Poland |
| 26. Pakistan | 65. Nicaragua |
| 27. Chile | 66. Ghana |
| 28. Bahamas | 67. Portugal |
| 29. Thailand | 68. Austria |
| 30. Peru | 69. Jordan |
| 31. Malaysia | 70. Bermuda |
| 32. Spain | 71. Macao |
| 33. Indonesia | 72. Barbados |
| 34. Republic of South Africa | 73. Haiti |
| 35. Philippines | 74. Finland |
| 36. Egypt | 75. Lebanon |
| 37. Ecuador | |
| 38. Panama | |
| 39. Trinidad and Tobago | |

Appendix 3: 2018 Export Market Rankings by Subsector

Ranked in order of value of projected annual exports, highest to lowest

2018 Top Markets: Heating, Ventilation, Air-Conditioning & Refrigeration (HVACR)

- | | |
|------------------------------|-------------------------|
| 1. Canada | 39. Hong Kong |
| 2. Mexico | 40. Turkey |
| 3. China | 41. Spain |
| 4. Saudi Arabia | 42. Trinidad and Tobago |
| 5. Germany | 43. Ireland |
| 6. United Kingdom | 44. Oman |
| 7. Brazil | 45. Nigeria |
| 8. Australia | 46. Costa Rica |
| 9. Japan | 47. Bolivia |
| 10. France | 48. Bahamas |
| 11. Korea | 49. Angola |
| 12. Singapore | 50. Vietnam |
| 13. Russia | 51. Israel |
| 14. United Arab Emirates | 52. Guatemala |
| 15. Netherlands | 53. Czech Republic |
| 16. India | 54. Bahrain |
| 17. Belgium | 55. Hungary |
| 18. Italy | 56. Honduras |
| 19. Taiwan | 57. El Salvador |
| 20. Venezuela | 58. Switzerland |
| 21. Colombia | 59. Poland |
| 22. Chile | 60. New Zealand |
| 23. Malaysia | 61. Denmark |
| 24. Pakistan | 62. Nicaragua |
| 25. Thailand | 63. Jamaica |
| 26. Peru | 64. Austria |
| 27. Dominican Republic | 65. Finland |
| 28. Ecuador | 66. Jordan |
| 29. Indonesia | 67. Cayman Islands |
| 30. Panama | 68. Bermuda |
| 31. Argentina | 69. Norway |
| 32. Republic of South Africa | 70. Barbados |
| 33. Iraq | 71. Haiti |
| 34. Philippines | 72. Macao |
| 35. Kuwait | 73. Lebanon |
| 36. Qatar | 74. Ghana |
| 37. Sweden | 75. Portugal |
| 38. Egypt | |

2018 Top Markets: Lighting

1. Canada
2. Mexico
3. China
4. Korea
5. Saudi Arabia
6. Germany
7. Japan
8. United Kingdom
9. Taiwan
10. Netherlands
11. Australia
12. Singapore
13. Hong Kong
14. Hungary
15. United Arab Emirates
16. Colombia
17. Bahamas
18. France
19. Italy
20. Venezuela
21. Macao
22. Qatar
23. Chile
24. Brazil
25. Peru
26. Argentina
27. Costa Rica
28. Panama
29. India
30. Israel
31. Malaysia
32. Thailand
33. Philippines
34. Belgium
35. Ecuador
36. Trinidad and Tobago
37. Poland
38. New Zealand
39. Ireland
40. Spain
41. Switzerland
42. Vietnam
43. Guatemala
44. El Salvador
45. Oman
46. Cayman Islands
47. Nicaragua
48. Dominican Republic
49. Honduras
50. Russia
51. Denmark
52. Kuwait
53. Jamaica
54. Bolivia
55. Bermuda
56. Czech Republic
57. Turkey
58. Republic of South Africa
59. Egypt
60. Austria
61. Ghana
62. Bahrain
63. Norway
64. Pakistan
65. Barbados
66. Angola
67. Finland
68. Nigeria
69. Lebanon
70. Haiti
71. Jordan
72. Sweden
73. Iraq
74. Portugal
75. Indonesia

2018 Top Markets: Plumbing

1. Mexico
2. Canada
3. Saudi Arabia
4. United Arab Emirates
5. Taiwan
6. United Kingdom
7. Venezuela
8. Korea
9. Australia
10. Republic of South Africa
11. Japan
12. Qatar
13. Bahamas
14. Chile
15. Singapore
16. Hong Kong
17. Iraq
18. Malaysia
19. France
20. Trinidad and Tobago
21. Colombia
22. Panama
23. Dominican Republic
24. Brazil
25. Germany
26. Jamaica
27. Belgium
28. Egypt
29. India
30. Israel
31. Norway
32. Jordan
33. Peru
34. Ghana
35. Czech Republic
36. Barbados
37. Ecuador
38. Turkey
39. Indonesia
40. Cayman Islands
41. Ireland
42. China
43. Kuwait
44. Costa Rica
45. Thailand
46. Austria
47. Switzerland
48. Oman
49. Sweden
50. El Salvador
51. Nicaragua
52. Russia
53. New Zealand
54. Bahrain
55. Haiti
56. Argentina
57. Honduras
58. Angola
59. Poland
60. Spain
61. Lebanon
62. Bermuda
63. Guatemala
64. Vietnam
65. Macao
66. Portugal
67. Bolivia
68. Nigeria
69. Denmark
70. Hungary
71. Italy
72. Finland
73. Pakistan
74. Netherlands
75. Philippines

2018 Top Markets: Wood Products

1. China
2. Canada
3. Mexico
4. Japan
5. Vietnam
6. United Kingdom
7. Italy
8. Turkey
9. Australia
10. Spain
11. Korea
12. Dominican Republic
13. Bahamas
14. Pakistan
15. Taiwan
16. Germany
17. India
18. Indonesia
19. United Arab Emirates
20. Malaysia
21. Egypt
22. Trinidad and Tobago
23. Belgium
24. Thailand
25. Jamaica
26. Saudi Arabia
27. Portugal
28. Chile
29. Hong Kong
30. Israel
31. Philippines
32. Colombia
33. Nigeria
34. Peru
35. Republic of South Africa
36. Venezuela
37. Cayman Islands
38. Brazil
39. Ghana
40. Ireland
41. New Zealand
42. France
43. Singapore
44. Denmark
45. Guatemala
46. Haiti
47. Lebanon
48. Norway
49. Sweden
50. Panama
51. Barbados
52. Qatar
53. Kuwait
54. Honduras
55. Jordan
56. Czech Republic
57. Bermuda
58. Netherlands
59. Austria
60. Bahrain
61. Costa Rica
62. Iraq
63. Angola
64. El Salvador
65. Finland
66. Hungary
67. Switzerland
68. Oman
69. Bolivia
70. Ecuador
71. Nicaragua
72. Poland
73. Macao
74. Argentina
75. Russia

2018 Top Markets: Insulation

1. Mexico
2. Canada
3. China
4. United Kingdom
5. Korea
6. Australia
7. Brazil
8. Japan
9. France
10. Germany
11. Turkey
12. Netherlands
13. Italy
14. Colombia
15. Thailand
16. Venezuela
17. United Arab Emirates
18. Kuwait
19. Malaysia
20. New Zealand
21. Chile
22. Norway
23. Costa Rica
24. Bahamas
25. Czech Republic
26. Denmark
27. Peru
28. Qatar
29. Dominican Republic
30. Singapore
31. Trinidad and Tobago
32. Spain
33. Egypt
34. Indonesia
35. Saudi Arabia
36. Sweden
37. Panama
38. Israel
39. Switzerland
40. Vietnam
41. Honduras
42. India
43. Taiwan
44. Austria
45. Guatemala
46. Argentina
47. Cayman Islands
48. Nicaragua
49. El Salvador
50. Jamaica
51. Philippines
52. Hong Kong
53. Poland
54. Bermuda
55. Oman
56. Pakistan
57. Jordan
58. Ghana
59. Angola
60. Finland
61. Iraq
62. Hungary
63. Barbados
64. Ireland
65. Bolivia
66. Portugal
67. Nigeria
68. Republic of South Africa
69. Lebanon
70. Haiti
71. Macao
72. Belgium
73. Bahrain
74. Ecuador
75. Russia

2018 Top Markets: Doors and Windows

1. Canada
2. Mexico
3. Bahamas
4. Australia
5. Saudi Arabia
6. Russia
7. United Kingdom
8. Japan
9. Venezuela
10. Netherlands
11. Korea
12. United Arab Emirates
13. Norway
14. Philippines
15. Pakistan
16. Belgium
17. Taiwan
18. Ghana
19. Kuwait
20. Cayman Islands
21. Israel
22. Colombia
23. New Zealand
24. Dominican Republic
25. Bermuda
26. Jamaica
27. Peru
28. Costa Rica
29. Brazil
30. Singapore
31. Trinidad and Tobago
32. Macao
33. India
34. Oman
35. Germany
36. Spain
37. Haiti
38. Ireland
39. Nigeria
40. Chile
41. Egypt
42. Panama
43. Guatemala
44. Turkey
45. Barbados
46. Bahrain
47. Nicaragua
48. Sweden
49. Argentina
50. Poland
51. Thailand
52. Bolivia
53. Republic of South Africa
54. Finland
55. Honduras
56. Italy
57. Angola
58. Denmark
59. Vietnam
60. Lebanon
61. Malaysia
62. Ecuador
63. El Salvador
64. Switzerland
65. Czech Republic
66. Portugal
67. Austria
68. Hungary
69. Indonesia
70. Jordan
71. Iraq
72. Qatar
73. Hong Kong
74. France
75. China

2018 Top Markets: Glass

1. Hong Kong
2. Canada
3. Mexico
4. Colombia
5. United Arab Emirates
6. Republic of South Africa
7. Turkey
8. Australia
9. Venezuela
10. Kuwait
11. Argentina
12. Germany
13. Netherlands
14. Egypt
15. Hungary
16. Israel
17. Vietnam
18. Russia
19. Saudi Arabia
20. Dominican Republic
21. Panama
22. France
23. China
24. Japan
25. Lebanon
26. New Zealand
27. Switzerland
28. Costa Rica
29. Austria
30. Bahrain
31. Haiti
32. Honduras
33. Jamaica
34. Nigeria
35. Bolivia
36. Bahamas
37. Nicaragua
38. Denmark
39. Pakistan
40. Norway
41. Ireland
42. Thailand
43. Guatemala
44. Bermuda
45. Oman
46. El Salvador
47. Ghana
48. Trinidad and Tobago
49. Czech Republic
50. Angola
51. Barbados
52. Portugal
53. Iraq
54. Philippines
55. Macao
56. India
57. Jordan
58. Korea
59. Ecuador
60. Cayman Islands
61. Indonesia
62. Poland
63. United Kingdom
64. Qatar
65. Finland
66. Italy
67. Belgium
68. Chile
69. Spain
70. Peru
71. Singapore
72. Taiwan
73. Sweden
74. Brazil
75. Malaysia

Appendix 4: Data Concordance: List of Harmonized Tariff Schedule Codes

Data Concordance: Heating, Ventilation, Air-Conditioning & Refrigeration (HVACR)

HTS Codes

732211	RADIATORS FOR CENTRL HTNG AND PARTS, CAST IRON
732219	RADIATORS FOR CNTRL HTNG AND PARTS, IOS EXC CSTIRN
732290	AIR HTRS A HOT AIR DIST NT ELEC HTD WFAN, PRTS IOS
840310	CENTRAL HEATING BOILERS
840390	PARTS FOR CENTRAL HEATING BOILERS
840410	AUX PLANT FOR USE WITH BOILERS
840420	AUX PLANT, CONDENSERS FOR STEAM OR VAPOR POWER UNITS
840490	AUX PLANT, PARTS
841430	COMPRESSORS USED IN REFRIGERATING EQUIPMENT
841451	TABLE, FLOOR ETC FANS ELECTRIC NOT EXCEED 125 W
841459	FANS, NESOI
841480	AIR/GAS PUMPS, COMPRESSORS AND FANS ETC, NESOI
841490	AIR/GAS PUMP, COMPRESSOR AND FAN ETC PARTS, NESOI
841510	AIR CONDITION MACH, WINDOW/ WALL TYPE, SELF CONT
841581	AIR CONDITIONING MACH ETC INCL REFRIG UNIT ETC
841582	AIR CONDITIONING MACH ETC INCORP REFRIG UNIT NESOI
841583	AIR CONDITIONING MACHINES ETC NOT INCL REFRIG UNIT
841590	PARTS, NESOI, OF AIR CONDITIONING MACHINES
841610	FURNACE BURNERS FOR LIQUID FUEL
841620	FURNACE BURNERS FOR PULVERIZED SOLID FUEL/GAS ETC
841630	MECH STOKERS, GRATES, ASH DSCHRGER & SIM APPLIANCS
841690	PARTS OF FURNACE BURNERS
841861	COMPRES TYPE HEAT PUMP UNIT W HEAT EX NESOI
841869	REFRIGERATING/FREEZING EQUIPMENT, NESOI
841899	REFRIGERATOR FREEZER AND HEAT PUMP PARTS NESOI
841911	INSTANTANEOUS GAS WATER HEATERS
841919	INSTANT/STORAGE WATER HEATRS EX INSTANT GAS WTR NE
841981	MACHINERY ETC FOR MAKING HOT DRINKS COOKING HEATNG
841990	PARTS FOR MACHINERY PLANT OR LAB EQUIPMENT ETC
842112	CLOTHES-DRYERS, CENTRIFUGAL
842129	FILTER/PURIFY MACHINE & APPARATUS FOR LIQUID NESOI
842191	PARTS OF CENTRIFUGES, INCLUDING CENTRIFUGAL DRYERS
847960	EVAPORATIVE AIR COOLERS
903210	THERMOSTATS
903220	MANOSTATS
903289	AUTO REGULATING INS & APPR EX THROSTAT,MNSTAT, ETC
903290	PTS, AUTOM REGULATING/CONTROLLING INST & APPRTS

Data Concordance: Lighting

HTS Codes

701110	GLASS ENVELOPES (INCLUDING BULBS AND TUBES), OPEN, AND GLASS PARTS THEREOF, WITHOUT FITTINGS, FOR ELECTRIC LIGHTING
853910	SEALED BEAM ELECTRIC LAMP UNITS
853921	TUNGSTEN HALOGEN ELECTRIC FILAMENT LAMPS
853922	FILAMENT LAMP POWER NOV 200 W & VOLTAGE OVER 100 V
853929	FILAMENT LAMPS EX ULTRAVIOLET/INFRARED LAMPS NESOI

853931	DISCHARGE LAMPS, (EX ULTRAVIOLET), FLUORESCENT
853932	MERCURY OR SODIUM VAPOR LAMPS; METAL HALIDE LAMPS
853939	DISCHARGE LAMPS EX ULTRVILT FLURSCNT HT CTHDE LAMP
853940	ULTRAVIOLET OR INFRARED LAMPS; ARC LAMPS
853941	ARC LAMPS
853949	ULTRAVIOLET OR INFRARED LAMPS
853990	PARTS FOR ELECT FILAMENT, DISCHARGE OR ARC LAMPS
854610	ELECTRICAL INSULATORS OF GLASS
854620	ELECTRICAL INSULATORS OF CERAMICS
854690	ELECTRICAL INSULATORS, NESOI
854710	INSULATING FITTINGS OF CERAMICS FOR ELECTRICAL MCH
854720	INSULATING FITTINGS FOR MACHINES MADE OF PLASTIC
854790	INSLT FIT EX CERAM/PLAS;ELEC COND TB/JNT,BMTL ETC
940510	CHANDELIER CEILING/WALL LGHTNG FTTNG EX PUBLIC LGHT
940540	OTHER ELECTRIC LAMPS AND LIGHT FITTINGS
940560	ILLUMINATED SIGNS
940591	PARTS, OF GLASS
940592	PARTS, OF PLASTIC
940599	PARTS, OF OTHER

Data Concordance: Plumbing Products

HTS Codes

391721	TUBES, PIPES & HOSES, RIGID OF POLYMRS OF ETHYLENE
391723	TUBES, PIPES & HOSES, RIGID, POLYMR VINYL CHLORIDE
391220	LAVATORY SEATS AND COVERS
392210	BATHS, SHOWER BATHS,SINKS & WASHBASINS, OF PLASTIC
392290	BIDETS, LAVATORY PANS, SIMILR SANIT WARE, PLASTIC
691010	CERAMIC SANITARY FIXTURES OF PORCELAIN OR CHINA
691090	CERAMIC SANITARY FIXTURES OTH THN OF PORCLN/CHINA
732410	SINKS AND WASH BASINS OF STAINLESS STEEL
732421	CAST IRON BATHS ENAMELED OR NOT
732429	BATHS OF IRON OR STEEL, OTHER THAN CAST IRON
732490	OTHER SANITARY WARE, INCLUDING PARTS, IRN/ST NESOI
741110	TUBES & PIPES OF REFINED COPPER
741121	TUBES & PIPES; OF BRASS (COPPER ALLOY)
741122	TUBES A PIPS OF CUPRO-NIKL OR NICKEL-SILVER
741129	TUBES & PIPES, OF COPPER ALLOYS NESOI
741210	FITTINGS, PIPE AND TUBE OF REFINED COPPER
741220	COPPER ALLOY TUBE OR PIPE FITTINGS
741820	SANITARY WARE AND PARTS THEREOF, OF COPPER
741991	ARTICLES OF COPPER NESOI, CAST, MOLDED ETC
741999	ARTICLES OF COPPER NESOI

Data Concordance: Wood Products

440121	WOOD IN CHIPS
440122	WOOD IN CHIPS
440310	WOOD IN THE ROUGH
440320	WOOD IN THE ROUGH
440391	WOOD IN THE ROUGH
440392	WOOD IN THE ROUGH
440399	WOOD IN THE ROUGH
440610	RAILWAY, TRAMWAY SLEEPERS, WOOD, NOT IMPREGNATED
440690	RAILWAY/TRAMWAY SLEEPERS (CROSS-TIES), WOOD, NESOI
440710	CONIFEROUS WOOD SAWN, SLICED ETC, OVER 6 MM THICK

440721 MAHOGANY, SAWN/CHIPPED LENGTHWISE, SLICED/PEELED
 440722 VIROLA, IMBUIA & BALSAM SAWN/CHIPPED LNWS, SLICED/PLD
 440723 BABOEN/MOHOGANY/IMBUIA/BALSAM WOOD SAWN OR CHIP ETC
 440724 VIROLA/MOHOGANY/IMBUIA/BALSAM WOOD SAWN OR CHIP ETC
 440725 DARK/LIGHT RED MERANTI & MERANTI BAKAU ETC, LUMBER
 440726 WHITE LAUAN/MERANTI/SERAYA, YELLOW MERANTI & ALAN
 440727 SAPELLI, SAWN/CHIPPED LENGTHWISE, SLICED/PEELED
 440728 IROKO SAWN OR CHIPPED LENGTHWISE, SLICED OR PEELED
 440729 OTHER TROPICAL WOOD,WOOD SAWN/CHIPPED LNNGTHWSE ETC
 440791 OAK WOOD, SAWN, SLICED ETC, OVER 6 MM THICK
 440792 BEECH WOOD, SAWN, SLICED ETC, OVER 6 MM THICK
 440793 MAPLE SAWN OR CHIPPED LENGTHWISE, SLICED OR PEELED
 440794 CHERRY, SAWN/CHIPPED LENGTHWISE, SLICED/PEELED
 440795 ASH, SAWN OR CHIPPED LENGTHWISE, SLICED OR PEELED
 440799 NONCONIFEROUS WOOD NESOI, SAWN, SLICED ETC, OV 6MM
 440810 VENEER SHEET ETC, NOT OVER 6MM THICK, CONIFEROUS
 440820 VEN/PLYWD SHEET SAW LNNGTHWS NOV6MM, TROPICAL WOODS
 440831 VEN/PLYWD SHEET SAW LNNGTHWS NOV6MM, TROPICAL WOODS
 440839 OTHER TROPICAL WOOD NESOI VEN/PLYWD SHT NOV6MM ETC
 440890 VENEER SHEET ETC, NOT OV 6MM, NONCONIFEROUS NESOI
 440910 WOOD, TONGUED, GROOVED, MOLDED ETC, CONIFEROUS
 440920 WOOD, TONGUED, GROOVED, MOLDED ETC, NONCONIFEROUS
 440921 BAMBOO CONT. SHAPED ALONG ANY EDGES, ENDS OR FACES
 440929 NONCON WD EXC BAMBOO CONT SHPD ALNG EDGES ENDS ETC
 441010 PARTICLE BOARD AND SIMILAR BOARD OF WOOD
 441011 PARTICLE BOARD, OF WOOD
 441012 ORIENTED STRAND BOARD (OSB), OF WOOD
 441019 WAFERBOARD AND SIMILAR BOARD, OF WOOD, NESOI
 441021 ORIENTED STRAND/WAFERBRD OF WOOD, UNWORKED/SANDED
 441029 ORIENTED STAND BOARD & WAFERBOARD, OF WOOD, NESOI
 441031 PART&SIM BRD OF WOOD,UNWORK/NT FUTH WRK THN SANDE
 441032 PART&SIM BRD OF WOOD,SURF CVD W/MELAMINE IMRG PPR
 441033 PART&SIM BRD OF WOOD,SURF CVD W/ DEC. PLAST LAMIN
 441039 PARTICLE & SIMILAR BOARD OF WOOD, NESOI
 441090 PARTICLE, SIMILAR BOARD OF LIGNEOUS MAT'L NESOI
 441111 FIBERBD LIGNEOUS OV.8G/CM3 NOT MECHANICALLY WORKED
 441112 MEDIUM DENSITY FIBERBOARD, OF A THICKNESS LT=5MM
 441113 MEDIUM DENSITY FIBERBOARD, THICKNESS GT 5MM LT=9MM
 441114 MEDIUM DENSITY FIBERBOARD, OF A THICKNESS GT 9 MM
 441119 FIBERBRD WOOD/LIGNEOUS MAT'L DENSITY >.8G/CM3 NESOI
 441121 FIBERBD LIGNEOUS OV .5 NOV .8G/CM3 NT MECHANICL WK
 441129 FIBERBOARD WD/LIGNEOUS DENSTY .5 -.8 G/CM3, NESOI
 441131 FIBERBD LIGNEOUS OV.35/NOV.5G/CM3 NT SURFACE COVER
 441139 FIBERBOARD LIGNEOUS MAT'LS OV.35/NOV.5G/CM3 NESOI
 441191 FIBERBD LIGNEOUS, NOV35G/CM3, NOT MECH WK OR S COV
 441192 FIBERBOARD, OF A DENSITY EXCEEDING 0.8 G/CM3 NESOI
 441193 FIBERBOARD, DENSITY GT 0.5G/CM3, LT=0.8G/CM3 NESOI
 441194 FIBERBOARD, OF A DENSITY LT=5 G/CM3, NESOI
 441199 FIBERBOARD, LIGNEOUS, NOV 35 B/CM3, NESOI
 441210 PLYWOOD, VENEERED PNLS & SIM. LAMINATED, OF BAMBOO
 441211 PLYWOOD, PLY NOC 6MM, AT LEAST ONE PLY TROPIC WOOD
 441212 PLYWOOD, PLY NOV6MM OF WOOD SHEETS, NONCONIF NESOI
 441213 PLYWOOD AT LEAST ONE OUTER PLY TROPICAL WOOD
 441214 PLYWOOD,AT LEAST ONE OUTER PLY NONCONIFEROUS,NESOI
 441219 PLYWOOD, PLY NOV6MM, BOTH OUTER PLIES CONIFEROUS
 441221 PLY NESOI, VEN PAN ETC 1 OUT PLY HDWD 1 LAY PARTCL

441222	VENEER PANEL,ETC,OUTER NONCON,1 PLY TROPICAL,NESOI
441223	VENEER PANEL/ETC 1 LAYR PARTICLE BOARD, NESOI
441229	PLY NESOI, VEN PAN ETC 1 OUTER PLY HRDWOOD NESOI
441231	PLYWOOD EXC BAMBOO, EA PLY LT=6MM THK, TROPIC WOOD
441232	PLYWOOD EXC BAMBOO LT=6 MM THK NONCONIFEROUS NESOI
441239	PLYWOOD, EXC BAMBOO, LT=6 MM THK, CONIFEROUS NESOI
441291	PLY VEN PANL ETC, NESOI, AT LEAST 1 LAY PARTIC BD
441292	VENERRED PANELS,ETC.,AT LEAST 1 PLY TROPICAL,NESOI
441293	PLYWD, VEN PANELS, LAMNATD WD ONE PARTCLE BD NESOI
441294	BLOCKBOARD, LAMINBOARD AND BATTENBOARD, EXC BAMBOO
441299	PLYWOOD, VENEER PANELS & SIMILAR LAM WOOD, NESOI
441300	DENSIFIED WD BLOCKS/PLATES/STRIPS/PROFILE SHAPES
441830	PARQUET PANELS, OF WOOD
441840	FORMWORK (SHUTTERING) FOR CONCRETE CONSTRUCTN WOOD
441850	SHINGLES AND SHAKES OF WOOD
441860	BUILDERS' POSTS AND BEAMS, OF WOOD
441871	ASSEMBLED FLOORING PANELS OF WOOD, MOSAIC FLOORS
441872	ASSEMBLED FLOORING PANELS OF WOOD MULTILAYER NESOI
441879	ASSEMBLED FLOORING PANELS, OF WOOD, NESOI
441890	BUILDERS JOINERY AND CARPENTRY OF WOOD, NESOI
442190	ARTICLES OF WOOD, NESOI
940340	WOODEN KITCHEN FURNITURE, EXCEPT SEATS
940600	PREFABRICATED BUILDINGS

Data Concordance: Insulation

HTS Codes

680610	SLAG WOOL, ROCK WOOL ETC, IN BULK, SHEETS OR ROLLS
680690	MXTRS A ARTCLS OF HEAT OR SOUND ABS O INS NESOI
701939	GLASS NONWOVEN MATTRESSES, BOARDS ETC NESOI
701990	GLASS FIBERS & ARTICLES THEREOF NESOI

Data Concordance: Doors and Windows

HTS Codes

441810	WINDOWS, FRENCH-WINDOWS AND THEIR FRAMES, OF WOOD
441820	DOORS AND THEIR FRAMES AND THRESHOLDS, OF WOOD
730830	DRS, WNDWS A FRMS A THRSHLDS FR DRS, IRON OR STEEL
761010	ALU DOR WIN AND THEIR FRA AND THRES FOR DOORS
392520	DOORS, WINDOWS, THEIR FRAME AND THRESHOLDS (VYNIL, FIBERGLASS INCLUDED)
392530	SHUTTERS, BLINDS

Data Concordance: Glass

HTS Codes

700311	NONWIRED SHEETS OF CAST/RLD GLASS, BODY TINTD ETC
700312	NONWRD SHTS CAST/RLD GLASS, COLRD,OPAC,FLSHD,LAYRD
700319	CAST OR ROLLED GLASS IN NONWIRED SHEETS, NESOI
700320	WIRED SHEETS OF CAST OR ROLLED GLASS, UNWORKED
700330	PROFILES OF CAST OR ROLLED GLASS, UNWORKED
700410	DRW/BLWN GLSS SHTS CLR OPC FLSH ABSRB/RFLCTV LAYER
700420	DRW/BLWN GLASS SHEETS COLORD OPAC FLASH SPEC LAYER
700490	DRWN/BLWN GLSS SHTS W/WO ABSRB/RFCT LYR N OTH WRKD
700510	FLOAT GLASS ETC IN NONWRD SHTS W ABS/REFL LAYER
700521	NONWIRED GLSS CLRD OPC FLSHD OR SRFC GRND N AB/RF LY
700529	NONWIRED GLASS NESOI IN SHEETS

700530	FLOAT GLS ETC, WIRED SHTS, W OR WO ABSB LAYER UNWK
700729	LAMINATED SAFETY GLASS, NOT FOR VEHICULAR USE
700800	MULTIPLE-WALLED INSULATING UNITS OF GLASS

Appendix 5: Citations

- ¹ U.S. Census Bureau U.S. Merchandise Trade, Total U.S. Exports data for 2015 was utilized
- ² Utilizing U.S. Merchandise Trade total exports data for 2011-2015 for the 194 HTS product categories in the building product sector, ITA utilized a linear projection to smooth annual growth fluctuations, arriving at a projected 2018 export total for the sector.
- ³ Global Construction 2030, Oxford Economics and Global Construction Perspective, November 2015.
- ⁴ United Nations Environment Program, Department of Economic and Social Affairs, Population Division
- ⁵ United Nations Environment Program, Climate Change Mitigation statement
- ⁶ U.S. Census Bureau U.S. Merchandise Trade data for 2014 was utilized
- ⁷ Global HVAC Equipment Market Analysis – Estimation and Forecast (2015-2022), Research and Markets, February 2016.
- ⁸ Lighting the Way, McKinsey & Company
- ⁹ World Plumbing – Demand and Sales Forecast, February 2015, Freedonia Group
- ¹⁰ United Nations HS Merchandise Trade Database
- ¹¹ Grandview Research, November 2015.
- ¹² Global Window and Door Industry 2013-2018: Trends, Profits and Forecast Analysis, Research and Markets, September 2013.
- ¹³ UN HS Merchandise Trade Database
- ¹⁴ Projected compound annual growth rate, Construction in Australia – Key Trends and Opportunities to 2018, Timetric (2016)
- ¹⁵ Australian Government, Department of Industry, Innovation and Science, <http://www.industry.gov.au/ENERGY/ENERGYEFFICIENCY/Pages/NationalStrategyEnergyEfficiency.aspx>
- ¹⁶ Australian Government, Department of Industry, Innovation and Science, <http://www.industry.gov.au/energy/energyefficiency/non-residentialbuildings/governmentbuildings/energyefficiencyoperations/Pages/default.aspx>
- ¹⁷ Dodge Data and Analytics, World Green Building Trends 2016, Developing Markets Accelerate Global Green Growth, February 2016
- ¹⁸ United Nations HS Merchandise Trade data, Importing country reporting
- ¹⁹ United Nations, International Trade Statistics. The partner "Areas NES (not elsewhere specified)" is used (a) for low value trade and (b) if the partner designation was unknown to the country or if an error was made in the partner assignment. The reporting country does not provide the details of the trading partner in these specific cases. Sometimes reporters do this to protect company information.
- ²⁰ Natural Sciences and Engineering Research Council of Canada
- ²¹ <https://www.cagbc.org>
- ²² Construction in Chile, Key Trends and Opportunities to 2018, Reportlinker.com (June 2014)
- ²³ APEC Building Codes, Regulations and Standards, APEC Subcommittee on Standards and Conformance (2013)
- ²⁴ Global Construction 2020, Oxford Economics and Global Construction Perspectives
- ²⁵ Dodge Data and Analytics, World Green Building Trends 2016, Developing Markets Accelerate Global Green Growth, February 2016
- ²⁶ Green Building Overview of China, China Academy of Building Research, www.egeec.apec.org/dmsdocument/384
- ²⁷ China's Growing Green Building Industry and How U.S. Companies Can Get Involved, U.S. Consulate General Shanghai Commercial Service and Bisagni Environmental Enterprise, July 2015
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- ²⁹ Dodge Data and Analytics, World Green Building Trends 2016, Developing Markets Accelerate Global Green Growth, February 2016
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- ³¹ SmartMarket Report, Global Green Building Trends, McGraw-Hill Construction
- ³² Construction In Qatar – Key Trends and Opportunities to 2018, Timetric (2016)
- ³³ Construction In Bahrain – Key Trends and Opportunities to 2018, Timetric (2016)
- ³⁴ Construction In Bahrain – Key Trends and Opportunities to 2018, Timetric (2016)
- ³⁵ Construction In Japan – Key Trends and Opportunities to 2019, Timetric (2015)
- ³⁶ American Softwood Export Council, Japan
- ³⁷ *Promotion of Green Housing and Building in Japan – Standards, Voluntary Measures and Other Incentives*, presentation by Building Research Institute of Japan on behalf of the Ministry of Land, Infrastructure, Transport and Tourism, at APEC Workshop on Sharing Experiences in the Design and Implementation of Green Building Codes, Lima, Peru (March 2013)
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- ⁴¹ Construction In Mexico – Key Trends and Opportunities to 2018, Timetric (2016)

⁴² Dodge Data and Analytics, World Green Building Trends 2016, Developing Markets Accelerate Global Green Growth, February 2016

⁴³ <https://www.gov.uk/government/collections/national-infrastructure-plan>

⁴⁴ Dodge Data and Analytics, World Green Building Trends 2016, Developing Markets Accelerate Global Green Growth, February 2016

⁴⁵ <http://www.legislation.gov.uk/uksi/2015/102/contents/made>

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