

Executive Summary and Findings

The renewable energy sector promises continued growth for the foreseeable future, totaling \$7 trillion of expected cumulative global private-sector investment between 2012 and 2030. Despite some short-term challenges, growth is expected in each renewable energy subsector, including wind, solar, geothermal, biomass, hydropower, and renewable fuels – albeit at different rates. To better position U.S. exporters of these technologies for success in international markets, the U.S. Government launched the ambitious Renewable Energy and Energy Efficiency Export Initiative (RE4I) in December 2010. This *Renewable Energy Top Markets Report* is an important commitment of the RE4I. Intended to provide high-level information regarding key potential export markets for American companies, it provides a tool to steer exporters towards those markets where they may be most effective.

When President Obama announced the National Export Initiative (NEI) in 2010, he did so with the ambitious goal of doubling total U.S. exports over five years. To accomplish this goal, certain high-growth sectors, like renewable energy, needed to increase their exports more substantially. For this reason the U.S. Department of Commerce launched the Renewable Energy and Energy Efficiency Export Initiative (RE4I) with 11 other U.S. Government agencies.

In addition to improved financing, enhanced market access, and more strategic trade promotion, a fundamental pillar of the RE4I was – and remains – a renewed effort to improve two-way communication with the U.S. renewable energy industry. Over the last three years, several new initiatives have helped policy-makers gather direct feedback on the challenges faced by U.S. exporters overseas. New forms of communication now provide industry with updated information on news, upcoming events, and market research more frequently and of higher quality.

This report provides detailed analysis of ten key potential markets, contains six subsector-specific snapshots, and ranks 75 different markets in terms of expected exports through 2015. Information is provided

for the overall renewable energy sector and by subsector. The report reflects ITA’s commitment to rethink and improve our approach to providing U.S. exporters the specific, timely, and impactful information they need to succeed in foreign markets, ultimately leading to economic growth for communities and supply chains across the United States.

Using the Top Markets Report

The RE4I placed a special emphasis on helping small-and-medium sized enterprises (SMEs) overcome the hurdles to entering new markets. International markets can be daunting, especially for an SME, which is why most small exporters, when they do export, sell their products or services to only one market – typically Canada or Mexico. For such companies, the *Top Markets* report provides a high-level assessment of different market opportunities, allowing exporters to compare markets against each other and develop a more coherent, targeted export strategy.

Please note that rankings in the study [see Figure 1] are based solely on projected exports from the United States through 2015. Company-specific priorities may vary. In other words, just because a market ranks highly

Figure 1: Ranking of Markets for Total U.S. Renewable Energy Exports through 2015

1. Canada	11. Netherlands	21. Jamaica
2. China	12. South Africa	22. Venezuela
3. Brazil	13. Kenya	23. Russia
4. Chile	14. Israel	24. Guatemala
5. Mexico	15. India	25. Italy
6. United Kingdom	16. Korea	26. Uruguay
7. Nigeria	17. Japan	27. Costa Rica
8. Peru	18. Denmark	28. Vietnam
9. Belgium	19. France	29. Turkey
10. Philippines	20. Colombia	30. Germany

Figure 2: Renewable Energy & Energy Efficiency Exporter Portal



For updated information programs, opportunities, market research, and news from across the U.S. Government, visit our website at: www.export.gov/reee.

The site provides:

-  **New Market Intelligence Briefs**
-  **Information upcoming webinars, trade events, and missions**
-  **A U.S. Government Resource Guide for renewable exporters**

The Exporters' Portal is also supplemented by a monthly e-newsletter that highlights new information available on the website. Interested parties can register at www.export.gov/reee and click on the link to the "RE&EE Exporters e-Update."

on ITA's list of top export markets, it may not be the right market for your particular technology. For more granular analysis, ITA strongly encourages potential exporters to consult with their local U.S. Export Assistance Center [see <http://export.gov/usoffices> for contact information].

Moreover, each subsector faces different competitive challenges and each possesses various market characteristics that require export strategies to be highly nuanced and tactical in their implementation. In fact, the renewable energy sector is still so reliant on policy that any change in incentives – whether positive or negative – will have an almost immediate impact on a market's ability to attract clean energy investment which would result in export opportunities.

Exporters should have a firm understanding of a market's policy environment before developing a market entry strategy. Although this report provides a baseline of information, given the dynamic nature of policy environments, exporters are strongly advised to consult with in-country U.S. embassies or consulates in their market of interest for more up-to-date information. ITA also periodically releases detailed *Market Intelligence Briefs*, which provide information on specific policies, changing market dynamics, and key contacts within a country. These documents are available on [ITA's Renewable Energy and Energy Efficiency Exporters' Portal](#) [see Figure 2].

The Nature of U.S. Renewable Energy Exports

The *Top Markets* report identifies key trends that will have an impact on both the makeup of U.S. renewable energy exports through 2015 and the elements of an

effective strategy for delivering exported products or services to international buyers.

Over the next two years, for example, ITA expects wind energy to overtake solar as the leading renewable energy sector for U.S. exports. This is consistent with an oversupply of wind turbine manufacturing capacity and demonstrates the growing reliance on exports for the sector – a fact supported by strong anecdotal evidence.

Our analysis indicates that the wind subsector will account for nearly 32 percent of all renewable energy exports through 2015, followed by ethanol (27%) solar (19 percent), hydropower (14 percent), biomass pellets (7 percent), and geothermal (2 percent). These figures highlight the broad export profile of the U.S.-based renewable energy industry, as exports are projected in every technology subsector.

It is important to note that ITA's *Top Markets* analysis only considers the export of *products*, which are easier to track using harmonized tariff system codes. The export of *services*, however, may provide an even greater opportunity in many countries. Based on work recently undertaken by the [U.S. International Trade Commission](#), ITA believes service exports are closely correlated with the export of products into markets. The ranking of markets offered in the analysis should thus provide exporters an adequate assessment of overall renewable energy export potential by market.

While the export base of the U.S. renewable energy industry is varied, incorporating several facets of a deep supply chain, the destination of most exports is highly concentrated. When all subsectors are combined, the top 10 markets are expected to account for three-quarters of all U.S. renewable energy exports through

Figure 3: Differentiated Strategies for Different Market Dynamics

Characteristic	Potential Export Strategies	Examples
Large U.S. share in large RE market	<ul style="list-style-type: none"> Likely to find considerable interest in purchasing products or services Focus on meeting as many potential buyers or partners as possible 	Canada
Small U.S. share in a large RE market	<ul style="list-style-type: none"> Must understand if lack of market share is due to competitiveness constraints or protectionist barriers. Report market access barriers to local U.S. Department of Commerce staff Find niche opportunities for products in markets without protectionist policies in place 	China Japan UK India Brazil Italy
Large U.S. share, but small RE market	<ul style="list-style-type: none"> Participate in market development activities Position company early for when market begins to develop 	Mexico South Africa
Small U.S. Share in a small RE market	<ul style="list-style-type: none"> Understand that opportunities could be sparse and expect few other American companies to succeed 	Paraguay Sri Lanka

2015. The top 30 markets, shown in Figure 1, will account for nearly 96 percent of all exports in the sector. Canada alone will account for 32 percent of all U.S. exports, highlighting the importance of its growing renewable energy market and geographic proximity.

In many markets, only one or two subsectors are expected to account for the majority of U.S. exports. High ethanol demand, for example, drives the rankings of Brazil, Nigeria and Peru. In other markets – namely, China – the pace and scale of investment in renewable energy will support exports, even if individual exporters capture only a small share of the overall market.

Understanding Renewable Energy Markets

ITA encourages markets to be viewed in terms of two variables – import market size and market share [see Figure 3]. A market’s “score” on these variables can guide exporters in determining the types of activities that can be effective in certain markets. For the remainder of the study, markets are therefore referenced in terms of their market size and the share of the import market expected to be captured by U.S. exporters.

If a market is large and U.S. firms enjoy considerable market share, then exporters can be assured that business is possible and that meeting potential buyers or partners should be the primary focus of their efforts. The U.S. Government can help facilitate such meetings through trade missions, reverse trade missions, certified trade shows, and other traditional export promotion activities.

In markets that are large, but in which the United States enjoys only a small share of the import market, exporters must consider whether the lack of market share is based on insufficient competitiveness – i.e., the market demands products that most U.S. companies cannot sell competitively; or, whether U.S. products are kept out of the market by protectionist policies. If the latter is true, then exporters may want to consider exporting to another market, while U.S. Government agencies work to open the market to U.S.-made goods and services. If the former is true, then export opportunities may be limited to niche or high-tech products that are not commonly found in the market.

In markets where the United States enjoys considerable market share, but whose overall imports are low, export opportunities may be limited in the near-term. Exporters are nonetheless encouraged to monitor development closely and work towards integrating themselves in the market, such that when development occurs they are well positioned for success. Signs that the renewable energy market is emerging include a government’s effort to spur increased deployment and/or consumption through policies and incentives. Several Latin American markets fall into this category and will be targets for trade policy missions, technical capacity building, feasibility studies and other market-growing activities from the U.S. Government.

Finally, some markets are neither large nor support significant U.S. market share. In a time of tight resources, U.S. Government export promotion efforts in these markets will be limited. For companies that may

have a personal contact or can offer a specific technology, these markets may still provide some export value, although few American firms are expected to compete productively.

Challenges Facing U.S. Renewable Energy Exports

When designing export strategies, U.S. companies should be mindful of the challenges facing U.S. renewable energy exporters in international markets.

First, although many renewable energy technologies have been invented or developed in the United States, other countries now enjoy considerably more manufacturing capacity in the sector. Companies in these markets often benefit from increased economies of scale and have a manufacturing base to export from when international opportunities arise. This often puts U.S. firms at a disadvantage when competing abroad; a disadvantage that must often be overcome with higher quality products or services.

Second, protectionist policies like local content requirements and high tariffs limit demand for products imported from the United States. India, South Africa, Brazil, and Saudi Arabia have all used some form of policy to limit opportunities for foreign manufacturers to compete in their markets. The United States is committed to enforcing international trade obligations and using existing trade agreements and trade policy forums to address trade barriers when they arise.

When exporters encounter a trade barrier in a foreign market, they are encouraged to report it to the U.S. Embassy or Consulate in the market, or to a local U.S. Export Assistance Center. U.S. Government officials are prepared to advocate for U.S. companies in overseas markets and can sometimes help facilitate arbitration of disputes involving U.S. exporters.

Getting Support from the U.S. Government

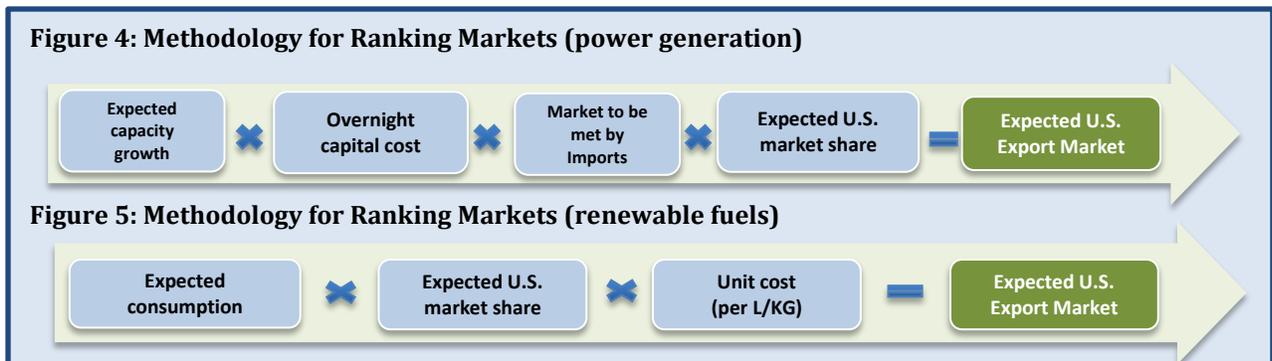
The most recent [Annual Review](#) of the RE4I found that under the initiative the U.S. Government has improved the availability of export financing for the renewable energy sector, facilitated the opening of new markets for U.S. goods and services, more strategically linked buyer and sellers of American technology, and enhanced communication between U.S. Government agencies and the renewable energy industry as a whole. In fact, while all 23 of the RE4I’s initial commitments have either been achieved or are in the process of implementation, the lasting legacy of the Initiative is its whole-of-government approach to providing exporters the services they need to be successful overseas.

Exporters are therefore encouraged to use the *Top Markets* report as a tool and a first step in analyzing different opportunities, but to work directly with U.S. Government agencies most relevant to their needs. For example, the Department of Commerce’s International Trade Administration has offices in nearly 100 cities and at 72 embassies and consulates around the world – in addition to sector specific analysts in Washington, DC.

Additionally, each U.S. Government agency involved in the RE4I can offer specific programs to support U.S. companies looking to sell products and services abroad. A guide to U.S. Government export promotion programs from across the RE4I agencies can be found at www.export.gov/reee/guide [see Figure 6].

Methodology

Accurately assessing renewable energy trade is difficult. The lack of trade codes often leads to inexact conclusions. Coupling projections of trade with future installation targets – either by technology or country – is often even more problematic given the sector’s reliance on government policy. ITA has sought to be clear about the assumptions made in its analysis and welcomes commentary on ways to improve the *Top Markets Study*.



To project the size of each country's expected imports from the United States, ITA used the formulas described in Figure 4 and 5. For each market, ITA estimated the projected capacity of installations for power generation technology expected in 2014 and 2015, as well as the consumption of biomass pellets and ethanol. The value of power generation investments was based on estimated costs from the National Renewable Energy Laboratory. ITA then estimated the proportion and value of the market likely to be captured by imports, as well as the percentage of imports expected to be captured by U.S. companies. For renewable fuels, the volume of U.S. exports could be directly compared to the consumption levels. The value was calculated based on the average unit price for U.S. exports of these commodities in each market.

Through these formulas, ITA was able to calculate a projected export market for each country and each subsector, allowing markets to be compared against one another. As more sophisticated data is developed, ITA will continue to update and improve its methodology, providing colleagues and stakeholders a more granular depiction of export opportunities.

A Few Caveats

The technologies used to produce power from biomass were excluded from the study, because the sector's diversity made calculations difficult. The term "biomass industry," for example, can be used to describe a wide range of technology solutions, including traditional biomass, waste-to-energy, and biogas – with each technology using different equipment for the production of electricity. The fact that ITA did not include these biomass-related technologies in this edition of the *Top Markets Study* should not be interpreted as a vote of low confidence in exports from the biomass industry. In fact, some countries that already have abundant natural resources for pellets, such as residues from the timber industry in Southeast Asia, may be suitable markets for biomass power equipment.

Data for certain subsectors was not available for all countries for a variety of reasons. The number of countries pursuing geothermal power, for example, is limited by availability of natural resources. In certain instances, the lack of consumption data limited ITA's ability to consider a market, as was the case for most renewable fuels markets outside of Europe.

Figure 6: A Guide to U.S. Government Export Financing Programs

Financing is often critical for securing or completing an export contract. The Overseas Private Investment Corporation (OPIC), the Export-Import Bank of the United States (Ex-Im Bank), the U.S. Department of Agriculture (USDA) and the Small Business Administration (SBA) offer programs like the ones below that can help U.S. renewable energy exporters compete effectively in foreign markets.

Export financing

- Working capital loan guarantees (SBA, Ex-Im Bank) – enable exporters to finance materials, labor, and overhead to produce goods or services for export.
- Other export loan guarantees (USDA, SBA, Ex-Im Bank) – provide U.S. government-backed guarantees for commercial banks that make international loans.
- Project and structured finance through direct loans (Ex-Im Bank) – involves long term arrangements for funding large U.S. investments that emphasize exports in both developed and emerging markets.
- Export credit insurance (Ex-Im Bank) – enables U.S. exporters to offer short- and medium-term credit directly to their customers during the pre- and post-shipment phases.

Investment financing

- Project finance through direct loans and loan guarantees (Ex-Im Bank, OPIC) – provides medium- and long-term financing for large- and small-scale renewable energy projects involving U.S. investors in emerging markets.
- Political risk insurance (OPIC) – used to mitigate political or sovereign risks for U.S. investors, operators, and lenders (e.g., expropriation, political violence, currency inconvertibility, and breach of contracts with foreign government-owned entities).

For more information, visit: www.export.gov/reee/guide.

Case Studies

ITA identified the following ten countries from the top 30 for in-depth case studies: Brazil, Canada, Chile, China, India, Italy, Japan, Mexico, South Africa and the United Kingdom. The markets represent a range of countries to illustrate a variety of points – not the top markets overall. The full list of rankings, as well as the full subsector rankings, is located in the Appendix. ITA also developed detailed case studies for the wind, solar, geothermal, hydropower, biomass pellets, and ethanol industries – the six subsectors included in the report's analysis.

2014 Renewable Energy Top Markets Report



This *Top Markets* Executive Summary is part of a larger report that includes rankings of 75 different markets in terms of overall U.S. renewable energy exports through 2015, as well as specific rankings for the ethanol, geothermal, hydropower, biomass pellets, solar and wind sectors. To access the full report, visit <http://export.gov/reee/topmarkets>.

About the Office of Energy and Environmental Industries

The Office of Energy and Environmental Industries (OEEI), a part of the International Trade Administration's Industry and Analysis unit, is dedicated to enhancing the global competitiveness of U.S. energy and environmental companies, expanding their market access, and increasing their exports. Industry analysts perform strategic research and analysis in order to shape and implement trade policy, create conditions that encourage innovation, lower the cost of doing business, and promote U.S. economic growth. For more information or to access other reports related to the Renewable Energy and Energy Efficiency Export Initiative, contact the office at (202) 482-5225 or visit www.export.gov/reee.

The International Trade Administration's mission is to create prosperity by strengthening the competitiveness of U.S. industry, promoting trade and investment, and ensuring fair trade and compliance with trade laws and agreements.



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