

July 2010

EXPORT-IMPORT BANK

Reaching New Targets for Environmentally Beneficial Exports Presents Major Challenges for Bank





Highlights of [GAO-10-682](#), a report to congressional committees

Why GAO Did This Study

The Export-Import Bank (Ex-Im) provides financing to support U.S. exports, and its support for environmentally beneficial exports has been of long-standing congressional interest. In fiscal year 2008, Congress directed Ex-Im to allocate 10 percent of its annual financing to renewable energy and environmentally beneficial products and services. For fiscal years 2009 and 2010, it directed Ex-Im to allocate 10 percent to renewable energy and energy efficient end-use technologies. In 2009, it directed GAO to conduct a review of Ex-Im's efforts to meet congressional directives concerning environmental exports financing. This report addresses (1) the extent of Ex-Im's financing of renewable energy, energy efficient end-use technologies, and other environmentally beneficial exports; (2) Ex-Im's definitions for, and its reporting on, these exports; and (3) the extent to which Ex-Im has followed strategic planning key practices in its planning efforts in these areas. GAO analyzed Ex-Im transaction data and planning documents and interviewed officials from Ex-Im, other U.S. agencies, state-level trade promotion agencies, environmental industry associations, and other industry experts.

What GAO Recommends

GAO recommends that Ex-Im (1) Develop clear definitions for its subcategories of environmentally beneficial exports—specifically energy efficient end-use exports—and report its financing in these areas, and (2) Consistently implement key strategic planning practices in this area.

View [GAO-10-682](#) or key components. For more information, contact Loren Yager at (202) 512-4347 or yagerl@gao.gov.

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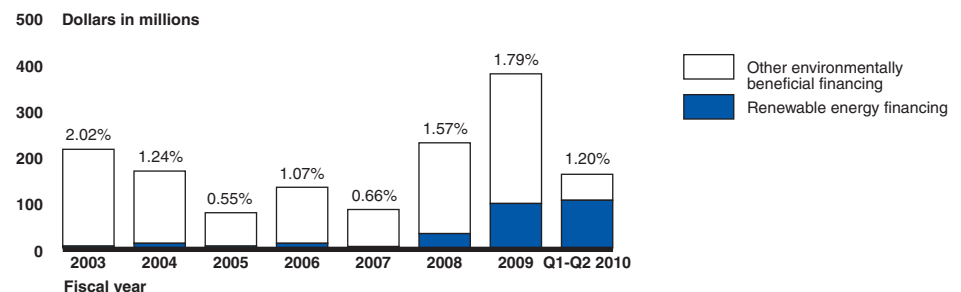
What GAO Found

Ex-Im's financing of exports it identified as environmentally beneficial was 1.3 percent of its total financing from fiscal year 2003 through the first half of fiscal year 2010. Ex-Im's environmentally beneficial exports include renewable energy, energy efficient exports including energy efficient end-use technologies, and a mix of other products with beneficial effects on the environment. Renewable energy was 0.23 percent of overall Ex-Im financing during the period. Ex-Im did not specifically report its energy efficient end-use financing through 2009, but officials stated the bank provided very little such financing over the period. Thus, Ex-Im financing for environmentally beneficial exports in general, and the smaller renewable energy and energy efficient end-use portion, has been well short of the 10 percent congressional target.

Ex-Im needs to further clarify its definitions and improve its reporting on environmentally beneficial exports. Ex-Im recently began tracking its financing of energy-efficient end-use technologies in its internal data. In March 2010 the bank released a list of examples for identifying the broader category of energy efficient technologies and services, but the list does not clearly identify the energy efficient end-use examples. Defining energy efficiency products and services is inherently challenging overall, and agencies sometimes use terms differently depending on their organizational needs. Thus, clear Ex-Im definitions are important for communicating with Congress, potential exporters, and others.

Ex-Im could benefit from more consistently following strategic planning key practices in its environmentally beneficial financing efforts. These include, for example, involving stakeholders, assessing internal and external environments, and realigning resources if needed. For example, while Ex-Im routinely shares information with stakeholders, such as other trade promotion agencies, industry associations, and lenders, it has not clearly communicated that it has a target requiring substantial increases in financing for this area.

Ex-Im Financing of Renewable Energy and Other Environmentally Beneficial Exports as Values and as Percentages of Total Ex-Im Financing, Fiscal Year 2003—Second Quarter 2010



Source: GAO analysis of Ex-Im Bank data.

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Abbreviations

CHP	combined heating, cooling, and power
CIRR	Commercial Interest Reference Rate
EBI	Environmental Business International, Inc.
ENV	Environmental Small Business
EU	European Union
GPRA	Government Performance and Results Act
NEPA	National Environmental Policy Act
NGO	nongovernmental organization
OECD	Organisation for Economic Cooperation and Development
OPIC	Overseas Private Investment Corporation
PV	photovoltaic
SIDO	State International Development Organizations
TPCC	Trade Promotion Coordinating Committee

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United States Government Accountability Office
Washington, DC 20548

July 14, 2010

The Honorable Patrick Leahy
Chairman
The Honorable Judd Gregg
Ranking Member
Subcommittee on the Department of State, Foreign Operations
and Related Programs
Committee on Appropriations
United States Senate

The Honorable Nita Lowey
Chairman
The Honorable Kay Granger
Ranking Member
Subcommittee on State, Foreign Operations
and Related Programs
Committee on Appropriations
House of Representatives

The Export-Import Bank of the United States' (Ex-Im) financing of environmentally beneficial exports has been an area of long-standing congressional interest. Since 1992, Congress has directed Ex-Im to report on its financing of these exports. In recent years, Congress has provided a 10 percent financing target for environmentally beneficial exports, and in 2009 it stated that the target be specifically for two subcategories of environmentally beneficial exports—renewable energy and energy efficient end-use technologies.

The Obama administration announced in March a National Export Initiative to substantially increase U.S. exports, and agency responses have included steps to develop a strategy for increasing renewable energy and energy efficient exports. As the U.S. government's official export credit agency, Ex-Im will play a role in this effort.

Fiscal year 2009 omnibus appropriations report language directed GAO to assess Ex-Im's efforts to realize recent congressional directives regarding the export of renewable energy and other environmentally beneficial

exports,¹ which include Ex-Im's efforts to meet a fiscal year 2008 directive that it develop a comprehensive strategy for increased financing of these exports.² To fulfill our mandate, we provided a briefing to congressional staff in September 2009 that outlined relevant parts of Ex-Im's export financing to date and identified several weaknesses in the strategy. This report provides a more complete examination of those issues. Specifically, this report addresses (1) the extent of Ex-Im's financing in recent years of renewable energy, energy efficient end-use technologies, and other environmentally beneficial exports; (2) Ex-Im's definitions for, and its reporting on, renewable energy, energy efficient end-use technologies, and other environmentally beneficial exports; and (3) the extent to which Ex-Im has followed strategic planning key practices in its planning efforts in these areas.

To determine the extent of Ex-Im's financing of environmental exports, we obtained and analyzed financing and transaction data, from fiscal year 2003 through the second quarter of fiscal year 2010, and related documents from Ex-Im and interviewed Ex-Im officials responsible for the data. To determine how Ex-Im has defined the various categories of environmentally beneficial exports, we examined Ex-Im documents and interviewed Ex-Im engineers and other officials involved with identifying and reporting financing for these exports. We also interviewed officials from other U.S. government agencies that have developed definitions for their activities in these areas, and reviewed relevant legislation concerning U.S. energy policy and climate change containing definitions or examples of terms for various types of environmental technologies. To determine to what extent Ex-Im followed strategic planning key practices, we obtained and reviewed Ex-Im staffing, budget, and strategic planning documents.³ We interviewed Ex-Im officials and various external stakeholders, including U.S. government agencies, state-level trade promotion agencies, industry representatives, and industry experts. We also reviewed information available on the size and scope of the environmental,

¹Committee Print of the House Appropriations Committee, p. 1925. (Omnibus Appropriations Act, 2009; Pub. Law 111-8.)

²House Report 110-197, p. 46.

³These documents included a strategic plan for environmentally beneficial exports submitted to Congress in April 2008, a series of business development plans for environmentally beneficial exports, and documents related to an agencywide strategic planning effort, which began in August 2009. This effort produced planning documents, and a draft written strategic plan in April 2010 that is not publicly available. We refer to all of these documents as strategic planning documents or initiatives.

renewable energy, and energy efficiency industries. For a more detailed explanation of our scope and methodology, see appendix I. We performed our work between August 2009 and July 2010 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe the evidence obtained provides a reasonable basis for our findings, conclusions and recommendations.

In this report, we recommend that the Chairman of the Export-Import Bank take steps to improve the planning and reporting of its activities related to environmental exports. These include providing clear definitions for its subcategories of environmentally beneficial exports and reporting annually on financing of them, and consistently implementing certain key practices of strategic planning. We provided a draft of this report to Ex-Im. Ex-Im provided written comments and agreed with our recommendations.

Background

Ex-Im is the official export credit agency of the United States and operates under the authority of the Export-Import Bank Act of 1945, as amended.⁴ It operates as an independent agency of the U.S. government with 358 full-time staff positions. Ex-Im's mission is to support U.S. exports and jobs by providing export financing on terms that are competitive with the official export financing support offered by other governments. Ex-Im offers a variety of financing instruments, including loans, loan guarantees, export credit insurance, and working capital guarantees for pre-export financing.⁵ Between fiscal years 2003 and 2008, Ex-Im authorized financing averaging \$12.8 billion annually. In fiscal year 2009, Ex-Im had a record year,

⁴Countries' export credit agencies provide export credits in support of their exporters competing for overseas sales. They provide credits to foreign buyers either directly or via private financial institutions. Export credit agencies can be government institutions or private companies operating on behalf of the government.

⁵Ex-Im loan guarantees cover the repayment risks on the foreign buyer's debt obligations incurred to purchase U.S. exports, guaranteeing a lender that, in the event of a payment default by the borrower, Ex-Im will pay the outstanding principal and interest. Ex-Im Bank's export credit insurance policies help U.S. exporters sell their goods overseas by protecting them against the risk of foreign buyer or other foreign debtor default for political or commercial reasons, allowing them to extend credit to their international customers for short-term or medium-term sales. Under its working capital guarantee program, Ex-Im provides repayment guarantees to lenders on secured, short-term working capital loans made to qualified exporters.

financing over \$21 billion in 2,891 authorizations. Since fiscal year 2008, Ex-Im has been “self-sustaining” for appropriations purposes, financing its operations from receipts collected from its borrowers.⁶

Congressional directives to Ex-Im concerning renewable energy and other environmental exports span many years. For example, 1989 legislation directed that Ex-Im should seek to provide at least 5 percent of its energy sector financing for renewable energy projects and should undertake efforts to promote renewable energy.⁷ Ex-Im generally did not achieve this numerical target. Ex-Im’s 2002 reauthorization legislation contained directives to promote renewable energy exports and report on promotion activities annually to Congress without specifying a numeric target.⁸ See appendix II for current information on renewable energy financing as a portion of Ex-Im’s overall energy sector financing.

The 10 percent financing targets for environmentally beneficial exports, including specific subcategories, are contained in 2008-2010 appropriations language:

- Fiscal year 2008 legislation directed that not less than 10 percent of Ex-Im’s financing should be used for “renewable energy and environmentally beneficial products and services.”⁹
- For each of fiscal years 2009¹⁰ and 2010,¹¹ Congress again specified a 10 percent target for Ex-Im financing but changed the targeted exports to renewable energy technologies or energy efficient end-use technologies.

⁶Ex-Im’s budget includes its program subsidy and its administrative expenses. Program subsidy is budgetary resources that must be allocated annually to reserve against any estimated cost of credit programs not covered by fees (on a present value basis). Congress retains oversight of Ex-Im’s budget by setting annual limits on Ex-Im’s use of funds for the program subsidy and administrative expenses. Each year Ex-Im submits budget estimates to the Office of Management and Budget for inclusion in the President’s annual budget proposal to Congress.

⁷Pub. L. No. 101-167, Sec. 534(d).

⁸Pub. L. No. 107-189, Sec. 13.

⁹Pub. L. No. 110-161.

¹⁰Pub. L. No. 111-8 (123 Stat. 524 at 858) (“energy efficient end-use technologies”).

¹¹Pub. L. No. 111-117 (123 Stat. 3034 at 3341) (“end-use energy efficiency technologies”).

In addition, the House Committee Report accompanying the fiscal year 2008 appropriations legislation directed Ex-Im to submit a comprehensive strategy to increase the financing of renewable energy and environmentally beneficial exports.¹² The House Appropriations Committee subsequently determined the quality and scope of that strategy to be inadequate.¹³ Furthermore, in addition to reiterating the 10 percent financing target, the House Conference Report on Ex-Im's fiscal year 2010 appropriations directed Ex-Im to identify and report on all financing carried out in fiscal year 2009 for renewable energy or end-use energy efficiency technologies, as well as other environmentally beneficial exports, and to explain how Ex-Im defines and tracks such activities.¹⁴

The wording changes in the financing targets are significant, since renewable energy and energy efficient end-use technologies are subcategories of environmentally beneficial goods and services (generally referred to as environmentally beneficial exports in this report). The changes leave out some environmentally beneficial exports that were previously included. As a result, Ex-Im cannot count toward this target many of the exports it classifies as environmentally beneficial. According to Ex-Im, the exports excluded from the target made up a substantial part of their environmentally beneficial exports financing in 2003-2009. These include, for example, wastewater treatment projects and technologies to reduce the carbon dioxide emissions of existing fossil fuel plants. Although Ex-Im is not required by law to meet the 10 percent target, Ex-Im officials have stated that they view the goal seriously and are working to achieve it.

Several key and related terms are used in this report in reference to Ex-Im's financing: (1) environmentally beneficial, (2) renewable energy, (3) energy efficiency technologies, and (4) energy efficient end-use technologies. Environmentally beneficial is an overarching Ex-Im category encompassing the subcategories listed as well as additional goods or services that Ex-Im identifies. Renewable energy is generally considered to be energy and the technologies that derive energy from naturally replenishing sources that are virtually inexhaustible over time. Ex-Im

¹²H. Report No. 110-197, p. 46.

¹³Committee Print of the House Appropriations Committee, pp. 1924-25 (Omnibus Appropriations Act, 2009; Pub. L. No. 111-8).

¹⁴H. Conf. Report No. 111-366, pp. 1493-4.

considers the following sectors to be eligible for financing incentives associated with renewable energy: wind energy, hydropower, solar photovoltaic and solar thermal energy, geothermal energy, ocean thermal energy, wave and tidal power, and bio-energy.¹⁵ In addition to equipment that produces renewable energy, Ex-Im typically considers all components, materials and services, used to build or upgrade renewable energy facilities, as renewable energy exports. Energy efficiency products and services—including the energy efficient end-use component—are less clearly defined, in part because they are frequently defined in comparison with an often-improving conventional product or methodology. The definitional issues are addressed below.

Ex-Im's energy financing, specifically its financing for fossil fuel projects, was the subject of a 2002 lawsuit brought against the bank and the Overseas Private Investment Corporation by environmental nongovernmental organizations and four U.S. cities.¹⁶ The lawsuit was settled in 2009 with Ex-Im agreeing to develop and implement a carbon policy for Ex-Im's financing; provide the Board of Directors with additional information about carbon dioxide emissions associated with potential fossil fuel transactions; and take a leadership role in consideration of climate change issues, promoting emissions mitigation measures within the Organisation for Economic Cooperation and Development (OECD) and among export credit agencies. Ex-Im's Board of Directors approved a carbon policy in November 2009, and Ex-Im announced an implementation policy for the plan in March 2010. Ex-Im's

¹⁵In determining the sectors eligible for renewable energy financing incentives, Ex-Im Bank adheres to Annex 4 to the OECD Arrangement on Officially Supported Export Credits. Annex 4 defines bio energy as all sustainable biomass, landfill gas, sewage treatment plant gas and biogas energy installations. 'Biomass' is defined as the biodegradable fraction of products, waste and residues from agriculture (including vegetal and animal substances), forestry and related industries, as well as the biodegradable fraction of industrial and municipal waste. Ex-Im Bank does not consider the production of bio fuel from corn or other agricultural products to constitute renewable bioenergy.

¹⁶*Friends of the Earth, Inc., et al. v. Spinelli, et al.* (Civ. No. 02-4106, N.D. Cal.) The lawsuit asserted that Ex-Im and the Overseas Private Investment Corporation (OPIC) provided assistance for fossil fuel projects that caused greenhouse gas emissions without complying with provisions of the National Environmental Policy Act requiring assessments of their projects' impacts on the U.S. environment resulting from their emissions. According to Ex-Im, it began in 1999 to track the annual estimated amount of carbon dioxide emissions produced by projects that the Bank supports through its export financing. These projects include fossil fuel power plants and projects in the oil and gas and petrochemical sectors financed by Ex-Im. This information is published in Ex-Im's annual report.

Carbon Policy Implementation Plan includes new procedures for evaluating high-carbon fossil fuel plants, generally coal-fired power plants, as well as additional incentives for some environmentally beneficial exports.¹⁷ (For information on Ex-Im's Enhanced Due Diligence Process for High Carbon Intensity Projects, see app. III.) Consistent with the settlement, Ex-Im is advocating within the OECD that member export credit agencies regularly report on their carbon output, as Ex-Im now does, and consider adopting their own environmental guidelines on carbon emissions.

Ex-Im offers enhanced financing terms for certain types of exports under its Environmental Exports Program. Ex-Im established the program in 1994, and recently announced additional enhancements for renewable energy as part of its Carbon Policy Implementation Plan. The specific enhancements Ex-Im offers reflect in part what financing terms are allowed under international agreements among export credit agencies, through the OECD. For example, under OECD agreements, renewable energy and water treatment exports are eligible for up to 18-year repayment terms, in contrast to the maximum 10- to 12-year terms available for standard equipment sales or non-nuclear power plants, respectively, under normal Ex-Im financing. (See app. IV for additional information on Ex-Im's incentives for environmental exports and app. V for additional information on financing amounts for Ex-Im's Environmental Exports Program.)

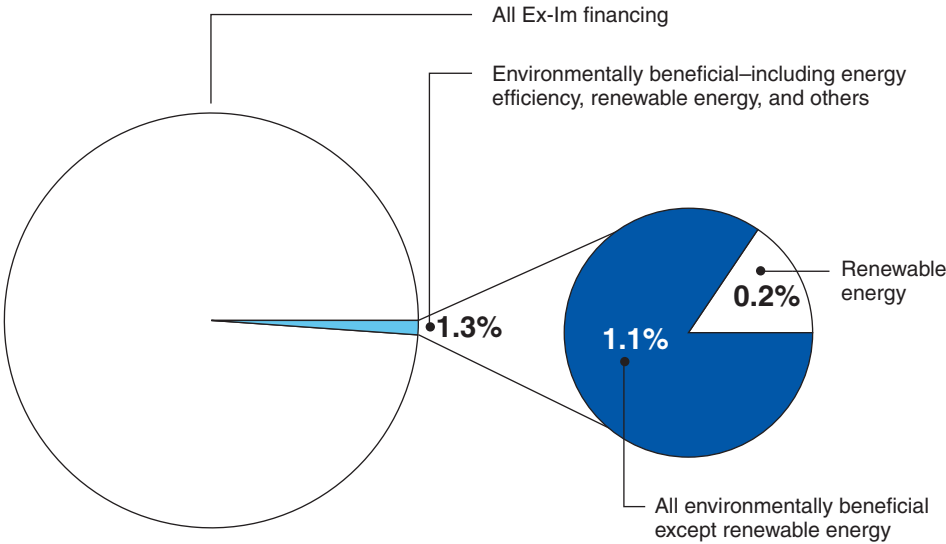
Since 2003, Environmentally Beneficial Exports Have Constituted 1.3 Percent of Ex-Im's Annual Financing

During fiscal year 2003 through the first half of fiscal year 2010, according to Ex-Im data, Ex-Im provided \$1.4 billion in financing for environmentally

¹⁷The carbon policy contains the following elements, among others: incentives for projects that reduce or mitigate carbon emissions, creation of a renewable energy loan guarantee facility of \$250 million, and affirmation of Ex-Im's encouragement of financing for products and projects related to energy efficiency. The policy does not prevent the board from approving coal projects. It provides for the board to have information about high carbon emission projects earlier in the application process and the board would have the option to decline a transaction at an early stage because of detrimental environmental effects. The due diligence process for high carbon intensity projects is described in app. III. The plan also requires that any projects with carbon emissions greater than 850 grams of carbon dioxide/kilowatt hour have verifiable offsets to reduce the project's carbon dioxide intensity to below that level. Ex-Im's Environmental Guidelines require that environmental impact assessments be conducted for certain international projects. See <http://www.exim.gov/products/policies/environment/envproc.cfm> and GAO, *Export Credit Agencies: Movement Toward Common Environmental Guidelines but National Differences Remain*, GAO-03-1093 (Washington, D.C.: Sept. 10, 2003).

beneficial exports, of which \$260 million was for renewable energy. Over that 7.5-year span, environmentally beneficial exports financing represented 1.3 percent of Ex-Im's total \$111 billion of financing. Renewable energy represented 0.23 percent of total Ex-Im-financed exports. (See fig. 1.) For information on how this financing is distributed across Ex-Im's three financing instruments, see app. VI.

Figure 1: Shares of Ex-Im Financing of Environmentally Beneficial Exports and Renewable Energy Exports, Relative to Ex-Im's Total Financing, Fiscal Year 2003–Second Quarter Fiscal Year 2010



Source: GAO analysis of Ex-Im Bank transaction data.

Ex-Im has not achieved the 10 percent environmental financing targets set by Congress in 2008-2010 (see above for details on these targets). Neither Ex-Im's financing of renewable energy and energy efficient end-use technologies nor the broader category of environmentally beneficial exports has approached 10 percent of total financing since 2003.¹⁸ As figure 2 shows, Ex-Im's financing for renewable energy has recently increased. Ex-Im's renewable energy financing in the first two quarters of fiscal year 2010 exceeded its renewable energy financing for all of fiscal

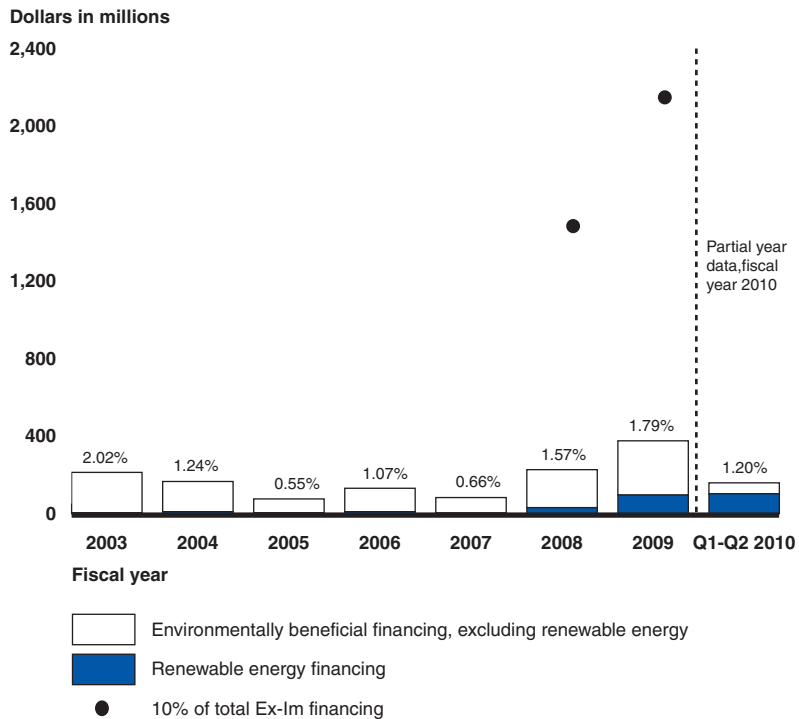
¹⁸Ex-Im financing data in this report are based on Ex-Im's current data collection and tracking system. Ex-Im used a different reporting system prior to 2003.

year 2009, which in turn represented an increase over fiscal year 2008.¹⁹ For reasons discussed below, Ex-Im did not track or report separately on energy efficient exports through fiscal year 2009. However, Ex-Im officials told us that they believed their financing of energy efficient end-use technology exports, which was specified in the 10 percent target beginning with fiscal year 2009, would have been minimal over the period.²⁰

¹⁹ According to Ex-Im data, one transaction authorized in November 2009, a wind power facility in Mexico, accounted for 79 percent of renewable energy financing in the first half of fiscal year 2010.

²⁰ As is discussed below, there is some overlap between two of Ex-Im's subcategories: renewable energy technologies and energy efficient end-use technologies. Thus, some exports that were categorized as renewable energy could have also been energy efficient end-use technologies. However, those would not increase Ex-Im's financing that would count toward meeting the fiscal year 2009 target.

Figure 2: Ex-Im's Annual Financing of Renewable Energy and Other Environmentally Beneficial Exports as Amounts and as Percentages of Ex-Im's Total Annual Financing, Fiscal Year 2003–Second Quarter Fiscal Year 2010, with Congressional Targets, 2008–2010



Source: GAO analysis of Ex-Im data.

Note: The 10 percent target did not exist before fiscal year 2008. For 2009, the target applies only to the subcategories of renewable energy and energy efficient end-use technologies, but the amount and percentage shown here are for all environmentally beneficial exports because Ex-Im did not separately track its financing for energy efficient end-use technologies over this period. From fiscal years 2003 through 2007, renewable energy financing was \$10 million or less per year.

Greater Clarity in Certain Ex-Im Definitions and More Detailed Reporting Could Facilitate Understanding of Its Environmental Exports Financing

Ex-Im's environmentally beneficial exports constitute an overarching category that includes renewable energy, energy efficient exports including energy efficient end-use technologies, and a mix of other products with beneficial effects on the environment. Ex-Im recently publicly provided examples for identifying energy efficiency exports, including energy efficient end-use exports, and began to track its financing for those exports in its internal data. Energy efficiency is inherently difficult to define because it depends on improvements relative to a moving baseline of efficiency standards across technologies. However, the examples Ex-Im released do not clearly distinguish between energy efficient end-use technologies and other energy efficiency technologies. Given the specific congressional interest in financing in this area, it is important that Ex-Im be as clear as possible in its application of terms, to facilitate communicating financing goals to potential exporters and others and communicating progress in meeting targets to Congress.

Composition of Ex-Im's Environmentally Beneficial Exports

Ex-Im's environmentally beneficial exports constitute an overarching category that encompasses the following subcategories, some of which Ex-Im had not separately identified until recently: (1) renewable energy products or services, (2) energy efficient end-use technologies, (3) other energy efficiency technologies, and (4) a number of technologies that improve the environment or mitigate various types of pollution, but are often not directly related to energy efficiency or carbon emissions.

Ex-Im engineers are responsible for determining whether export transactions are considered environmentally beneficial, and are consulted by Ex-Im staff in cases where the classification is not clear to nontechnical staff. Ex-Im officials said that in classifying exports, they examine the nature of the export or project, including its purpose, as well as the intent of the importer. In April of 2010, Ex-Im began identifying energy efficient end-use technologies as a separate category within its internal transactions data.²¹

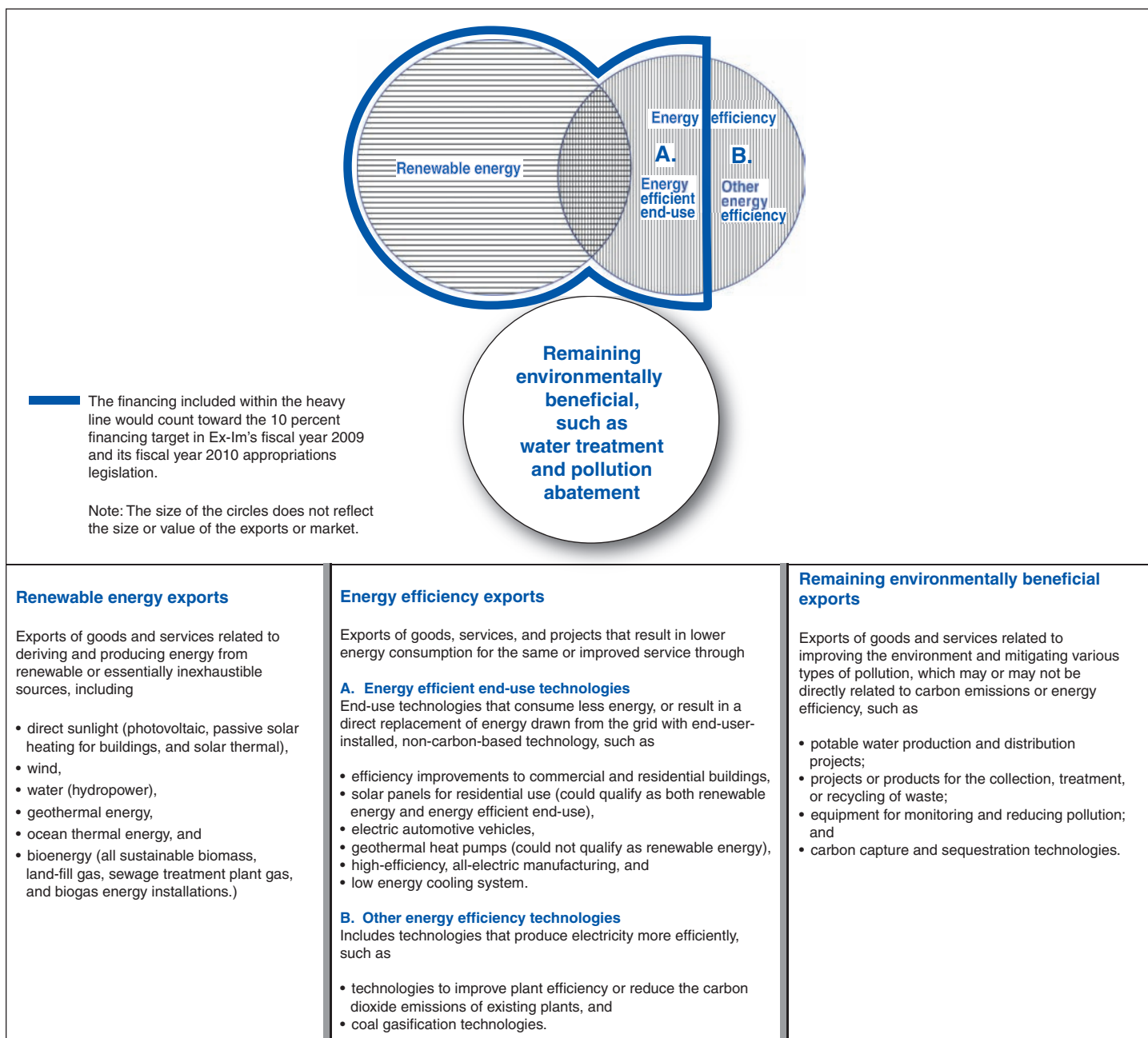
Figure 3 shows relationships among Ex-Im's subcategories of environmentally beneficial exports as of fiscal year 2010 and provides descriptions and examples of the subcategories, based on discussions with Ex-Im officials and review of Ex-Im documents. In the figure, the set

²¹Information on Ex-Im financing for energy efficient end-use technologies is not available for data prior to fiscal year 2010.

included by the heavy line would count toward Ex-Im's 10 percent financing target as laid out for both fiscal year 2009 and fiscal year 2010. There is some overlap between the renewable energy and the energy efficient end-use technology subcategories, according to how Ex-Im has classified its transactions. For example, recent Ex-Im transaction data show that three of the four transactions identified as energy efficient end-use authorized during the first two quarters of fiscal year 2010 were also renewable energy, because those transactions covered renewable energy exports (such as solar panels) destined for end-use applications.²²

²²These include, for example, solar panels on commercial buildings or systems for agricultural use.

Figure 3: Relationships among and Descriptions and Examples of Ex-Im's Subcategories of Environmentally Beneficial Exports, as of Fiscal Year 2010



Source: GAO analysis of Ex-Im documents and discussions with Ex-Im officials.

“Energy efficiency” is challenging to define, according to Ex-Im and other agency officials and experts we spoke with, because it requires a comparison with an often-improving conventional product or method. The threshold for what is an efficient product continually changes and there are no standard criteria for how much of an efficiency improvement is necessary. This issue is reflected in ongoing discussions concerning applying enhanced export credits terms to certain climate change technologies being carried out within the OECD. According to Ex-Im, one question the OECD is addressing is what technical standards could be used to determine energy efficiency technologies against a backdrop of multiple baselines that could be used to calculate efficiency gains.²³

Identifying energy efficient end-use technologies can involve particular challenges. According to Ex-Im, technologies that improve energy efficiency in the construction and other infrastructure sectors are difficult to identify and the end-use efficiency of a product can depend on how it is used. For example, Ex-Im said that the replacement of outdated thermostats in existing buildings with more efficient U.S.-manufactured thermostats would be considered an energy efficient end-use project, but if the developer’s purpose was simply to replace outdated thermostats, the transaction would not qualify. Ex-Im told us that, in certain cases, the determinations could appear to be inconsistent.

Ex-Im Has Not Clearly Communicated What It Considers to Be Energy Efficient End-Use Technologies

At its annual conference in March 2010, Ex-Im released a list of product and project examples that it labeled energy efficiency technologies and services. The list includes products and projects Ex-Im considers to be energy efficient end-use technologies, as well as other energy efficiency products and projects. However, Ex-Im’s original list did not distinguish between examples representing energy efficient end-use technologies and

²³ As a part of this process, the OECD is also discussing whether—from both a technical and political perspective—enhanced terms should be offered to technologies that are being developed and could foster or result in carbon dioxide emissions reduction, including certain clean coal technologies.

This evolution of technology can apply to other types of environmentally beneficial exports as well as energy efficiency. For example, Ex-Im stated that from 1997 to 2008, the bank considered certain combustion turbine power plants equipped with special burners that reduce the plants’ nitrous oxide emissions to specified low levels to be environmentally beneficial. (Such projects would be in the “remaining” category shown above). Ex-Im said that such burners are now required for virtually all combustion turbine power plants, so the projects would no longer be considered environmentally beneficial.

services and examples representing other energy efficiency technologies and services.

Although defining energy efficiency can be challenging, a clearer indication of what Ex-Im considers to be energy efficient end-use technologies is important because that subcategory, along with renewable energy, constitutes one of the two areas specified in the current congressional 10 percent financing target. In addition, as noted above, the conference report on Ex-Im's 2010 appropriation also directs Ex-Im to define energy efficient end-use technologies and to track its financing in that area.

Ex-Im identified for us the items on its list of energy efficiency examples that represent (1) energy efficient end-use technologies and services, (2) other energy efficiency technologies and services, and (3) technologies and services that could be either depending on the context of the transaction. We have reproduced Ex-Im's list below, formatted to show Ex-Im's identification of these items.

Examples of energy efficient end-use items are set in bold.

Examples of other energy efficiency items are italicized.

Examples that, according to Ex-Im, could be either energy efficient end-use items or other energy-efficiency items, depending on the specifics of a transaction, are left as regular text.

- **Buildings: design, engineering, or architectural services for new and existing buildings; energy audits; energy efficient insulation; building envelopes; solar-radiant barriers; advanced windows; energy efficient lighting; water heating; refrigeration technologies; and smart meters.**
- Industries: improvements in industrial design or process to reduce energy utilization, including *combined heating, cooling, and power (CHP); waste-heat recovery; preheating and efficient drives (motor, pump, compressors); and other technologies designed to reduce energy intensity.*
- Power generation facilities: *refurbishment and repowering (including hydropower), improved operations and maintenance practices, and better resource utilization (higher plant load factors and availability).*

-
- Reduced transmission and distribution losses: *high-voltage power lines, better-insulated conductors, capacitors, efficient and low-loss transformers, and improved metering systems and instrumentation.*
 - Smart grid technologies: **smart meters, remote sensors, energy-management systems, and energy storage devices.**
 - Transportation: **hybrid and electric vehicles; high miles-per-gallon vehicles; compressed natural-gas vehicles; and public transportation projects, including urban mass-transport systems, modal shifts to intercity and intracity rail and water transport, and improved fleet usage.**
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Ex-Im Recently Began Tracking Its Energy Efficient End-Use Financing and Has Not Publicly Reported That Information

Ex-Im began tracking its financing of energy efficient end-use technologies in April 2010. Before 2010, Ex-Im did not track or report its level of financing for energy efficient end-use technology exports. Annual reports through 2009 list financing for environmentally beneficial exports and the subcategory of exports that support renewable energy. Within Ex-Im's transaction data, there has not previously been a way to identify the total financing for other subcategories of environmentally beneficial exports, particularly energy efficient end-use technologies.

Definitions of Terms Used for Certain Categories of Environmental Goods and Services Vary across U.S. Agencies

U.S. agencies use a range of terms, sometimes differently, with respect to environmental goods and services, which makes it important for Ex-Im to clearly define the terms it uses. While Ex-Im uses the terms environmentally beneficial, renewable energy, and energy efficient, other agencies may use those as well as other terms to refer to environmental goods and services, including clean energy and climate-friendly. Agencies use and define these terms in certain ways that depend in part on their organizational needs and goals. For example, the Commerce Department is concerned with tracking the export of environmental goods, and the U.S. Trade Representative uses and defines terms as part of trade liberalization negotiations. Because U.S. agencies use a range of terms, sometimes differently, with respect to environmental goods and services, it is important that Ex-Im be as clear as it can in its own definitions so that Congress can understand the information Ex-Im reports relative to congressional financing targets.

Ex-Im Could Benefit from Greater Use of Strategic Planning Key Practices in Its Environmentally Beneficial Financing Efforts

While Ex-Im has taken steps to increase financing for environmentally beneficial exports, it could benefit from more consistently following strategic planning practices such as involving stakeholders, assessing the internal and external environments, and realigning resources. Ex-Im routinely shares information with stakeholders, but has not generally involved them in communicating goals or discussing strategies for achieving them. On the other hand, Ex-Im has taken some steps to assess factors that affect its financing of environmentally beneficial exports such as conducting analysis of the renewable energy market to identify the best sectoral and geographic opportunities for Ex-Im financing. Ex-Im has also considered reorganizing some staff into more focused teams to target priority industries and countries, but this effort has not included an analysis of the resources required to accomplish the goal of increasing certain types of environmentally beneficial exports.

Strategic Planning

GAO has identified a set of key steps for effectively managing for results.²⁴ There are three key steps: defining clear missions and desired outcomes, measuring performance to gauge progress, and using performance information as a basis for decision making. Within the first step, “define clear missions and desired outcomes,” there are three recommended practices:

- involving stakeholders in clarifying mission, priorities, and desired outcomes;
- assessing the external and internal environment; and
- realigning staff and resources to correspond with agency priorities.

These key practices can be applied to an organization’s strategic planning efforts and activities, as well as the process of creating a strategic plan.

Ex-Im has developed planning documents for its environmental exports activities, and has been engaged in a broader agencywide planning effort. Ex-Im presented a strategic plan for environmentally beneficial exports to Congress in April 2008. According to Ex-Im, this plan had been created using its annual business development plan for these exports, which is

²⁴For example, see GAO, *Executive Guide: Effectively Implementing the Government Performance and Results Act*, [GAO/GGD-96-118](#) (Washington, D.C.: June 1996).

developed by Ex-Im's Office of Renewable Energy and Environmental Exports and functions as a strategic plan for that office. Beginning in August 2009, Ex-Im has engaged in an agencywide strategic planning exercise, resulting in the creation of vision statements, strategic goals, and linked initiatives. Ex-Im provided these statements, goals, and initiatives, as well as a draft agencywide strategic plan to GAO.

Ex-Im Has Not Clearly Conveyed Its Goal of Substantially Increasing Environmentally Beneficial Financing to Stakeholders

While Ex-Im coordinates activities and shares information with stakeholders to some extent, it has not consistently worked with stakeholders to explain its goals, set priorities, and discuss strategies for increasing environmentally beneficial exports financing. Involving stakeholders effectively entails communicating with them about goals and soliciting their input when determining priorities and strategies. Ex-Im's stakeholders for environmentally beneficial exports financing include other U.S. government agencies, state-level trade promotion offices, members of the environmental industry, and lenders. Ex-Im shares information with these stakeholders but has not consistently communicated goals or discussed strategies with them for increasing environmentally beneficial exports financing. In addition, Ex-Im has also not involved stakeholders in the creation of strategic planning documents related to its environmentally beneficial exports financing. In general, stakeholders can be influential in whether programs succeed or fail, and their involvement is important to help agencies ensure that efforts are targeted at the highest priorities. For example, according to Ex-Im, Ex-Im's lenders play an important role in bringing Ex-Im's financing options to the attention of potential exporters who are not familiar with Ex-Im or with particular incentives the bank may offer.

Ex-Im officials working on environmentally beneficial export financing routinely share information with stakeholders about specific trade promotion activities and Ex-Im's incentives under the Environmental Exports Program. For example, Ex-Im coordinates with the Trade Promotion Coordinating Committee secretariat, Commerce Department, and the Small Business Administration to present information to potential exporters at conferences and seminars. These agencies also share information on trade opportunities. Ex-Im shares general information about its financing incentives with state-level trade promotion officials and other stakeholders by attending seminars, giving interviews to business publications, and working with these officials to provide information to industries and manufacturers in their states. Ex-Im conducts training sessions across the country with community bankers and larger lenders to discuss how Ex-Im financing can support exports.

However, while Ex-Im shares information with these stakeholders, it has not clearly and consistently communicated its strategic goal of substantially increasing financing for environmentally beneficial exports, including information on the target. While some U.S. government stakeholders were aware of Ex-Im's goals and target in this area, many were not aware of both. None of the state-level trade promotion agency officials we spoke with were aware that Ex-Im had a target that would require a substantial increase in financing for environmentally beneficial exports, although a prominent renewable energy association told us that Ex-Im does the best job among government agencies of outreach to the renewable energy industry through its organization. Ex-Im officials told us that the bank's designated lenders have been informed of the goal of increasing financing for environmentally beneficial exports. Of the members of the Ex-Im Advisory Committee with whom we spoke, most told us that they were aware that Ex-Im was focused on increasing environmentally beneficial exports but not all were aware of Ex-Im's target.

Ex-Im has not routinely discussed priorities, opportunities, or strategies for increasing financing for environmentally beneficial exports with stakeholders, including government agencies, state-level trade promotion agencies, members of the environmental industry, or lenders. Further, Ex-Im has not consulted these stakeholders in formulating strategic planning documents, such as its Office of Renewable Energy and Environmentally Beneficial Exports' Business Development Plans. Some U.S. government officials noted that these types of discussions have occurred between other trade promotion agencies, and one official in particular noted that this type of consultation would be helpful. Other government and industry stakeholders noted that their organizations could have market information or trade leads that would help Ex-Im to identify new customers.

Ex-Im Has Partially Assessed Factors Affecting Its Financing of Renewable Energy and Energy Efficient End-Use Technology Exports

Recognizing that achievement of an agency's goals can be affected by forces both outside and inside the agency, another best practice for strategic planning is for agencies to systematically assess the external and internal environments for their programs.

- Relevant external factors may include the following:
 1. sector and country market conditions for environmentally beneficial exports,
 2. firm conditions for producing those exports,
 3. capital market conditions for export financing, and

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4. international trade practices and regulations that govern foreign sales.

An example of an external factor would be that, while Ex-Im has some discretion in the financing terms it offers and in how it assesses risk for specific transactions, international agreements through the export credit group of the OECD, and the Department of the Treasury's (Treasury) role in implementing those agreements, can constrain its ability to offer more favorable terms unilaterally for certain types of products.

- Relevant internal factors may include the following:
 1. the degree to which Ex-Im's application and approval process is user-friendly,
 2. agency organization,
 3. the number of Ex-Im's staff promoting specific exports,
 4. the appropriateness of staff expertise,
 5. Ex-Im's risk tolerance, and
 6. Ex-Im's financing terms.

Ex-Im's strategic planning documents, some of which are being finalized, now contain some information on environmentally beneficial sector and country markets, capital and firm conditions, and policy considerations. Ex-Im's November 2009 business development plan for environmentally beneficial exports addresses market conditions and other external factors affecting its renewable energy export financing. Examples of specific findings from the plan on areas of growth and potential markets for U.S. exporters include the following:

- The best near-term opportunities for Ex-Im financing of renewable energy exports are in solar and wind, though the geothermal, small hydro, and biomass sectors may offer country-specific opportunities.
- The best country-specific opportunities are in those countries that have cost incentives based on feed-in tariffs,²⁵ or where ongoing capital constraints in the private sector limit activity, with specific mention of the European Union, Canada, and South Korea.

²⁵Feed-in tariffs require utilities to purchase renewable energy at a set price for a set term. The European Union (EU), for example, has mandated a 20 percent share of renewable energies in EU energy consumption by 2020.

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- Renewable energy export growth has been driven by new firms and small businesses, which often require additional assistance in structuring their financing.

(For more information on estimates of global markets for environmental goods and services, see app. VII.)

Ex-Im also cites other exporting countries' use of tied aid as an external factor that strongly affects market opportunities for renewable energy financing. Tied aid—government-to-government concessional financing of projects in developing countries linked to the procurement of goods and services from the donor country—is a tool that several countries have used to expand their renewable energy exports. Ex-Im concludes in the business development plan that despite opportunities for renewable energy exports to developing countries, without the availability of tied aid, U.S. exporters are unlikely to compete effectively with exporters from countries that provide it.²⁶

On the basis of this assessment, Ex-Im's planning documents identify several actions for promoting renewable energy export financing. The actions include, for example, more outreach to environmental exporters already using Ex-Im financing. They also include streamlined processing and greater risk tolerance for renewable energy transactions below \$10 million, such as through the Solar Fast Track initiative announced in March 2010.

Finally, Ex-Im's strategic planning for environmental exports could benefit from assessments of internal factors such as the adequacy of staff and resources to achieve its goals. Such assessments can provide a basis for taking steps to realign resources if needed, as discussed below. According

²⁶ An OECD agreement among member export credit agencies governs the use of tied aid. The rules do not allow tied aid for projects in higher-income countries or for projects that are commercially viable. Renewable energy projects have typically been considered eligible for tied aid under OECD rules and have received foreign tied aid support. In addition to the OECD rules, the U.S. government has long held a "no initiation policy" with respect to tied aid, and Ex-Im tied aid financing has been limited to matching foreign tied aid offers of other countries—rather than initiating tied aid for U.S. exports. Through the Tied Aid Credit Fund, Ex-Im may provide tied aid financing primarily to (1) support the negotiations and policing of OECD tied aid rules and (2) match foreign tied aid offers to level the playing field for U.S. exporters. Congress requires Ex-Im to comply with principles, processes and standards developed jointly by the Department of the Treasury and Ex-Im for approving the use of tied aid for specific projects, and Treasury can appeal a decision of the Ex-Im board to use tied aid to the President of the United States.

to GAO's analysis, the strategy for environmentally beneficial exports presented to Congress in April 2008 did not provide enough direction and priority to be able to realign staff and resources. Similarly, the draft strategic plan being developed since October 2009 does not discuss staff and other resources required to promote growth in environmentally beneficial export financing. The 2010 business plan for environmentally beneficial exports states that, on the basis of relationships staff have developed with industry associations, firms, and foreign buyers, Ex-Im has the necessary components in-house to successfully support renewable energy transactions. However, Ex-Im staff acknowledged that additional expertise and staff time may be required to provide counseling needed to support small business renewable energy exports. In addition, members of Ex-Im's advisory board told us that there are areas for potential improvement in the availability of resources to assist some renewable energy exporters with Ex-Im's application process.

Ex-Im Has Taken Some Internal Steps, but It Has Not Clearly Addressed the Resource Needs or Realignments for Increasing Environmental Exports Financing

Ex-Im has increased staff working directly on environmental exports and formed a new internal working group, but it has not fully identified resource realignments that may be needed. After assessing the internal organizational factors as part of a strategic planning effort, leading organizations then realign their resources, staff, and budget to match the priorities detailed within the strategic planning effort. On the basis of available information, Ex-Im's ongoing strategic planning initiative does not provide enough information to realign staff and resources to meet its current goals, including the 10 percent financing target for certain types of environmentally beneficial exports.

Following congressional direction, Ex-Im established the Office of Renewable Energy and Environmental Exports at the end of fiscal year 2007 with one staff person. After the target was established for fiscal year 2008, Ex-Im increased the number of officials working on renewable energy and environmental exports from one to three. These staff identify U.S. producers of environmentally beneficial goods and services, inform them of Ex-Im export financing assistance, encourage them to use Ex-Im financing, and help customers work through the bank's systems to obtain financing.

In addition, Ex-Im has convened a new Working Group on the Environment as an element of the November 2009 carbon policy. Although this working group is to focus on implementing the carbon policy, Ex-Im told us it also has some role, which is not yet clearly defined, in increasing financing for environmentally beneficial exports. This new working group

is different from the defunct Environmental Exports Team and tasked primarily to examine issues such as updating and reconciling the bank's environmental regulations and policies with the new carbon policy and the strategic planning initiative.²⁷ The Working Group on the Environment has eight staff from various offices specifically assigned to it, including staff from the offices of General Counsel, Policy and Planning, Congressional Affairs, Engineering and Environment, Structured Trade Finance, and Renewable Energy and Environmental Exports.

A senior Ex-Im official told us that organization charts do not effectively show the extent of Ex-Im's resource commitment to environmentally beneficial exports, and said that Ex-Im has sufficient staff assigned throughout the bank for environmental exports. In addition to the Office of Renewable Energy and Environmental Exports staff, the other staff members include attorneys, engineers, policy specialists, structured finance specialists, and others. However, their primary duties do not involve market development or looking for U.S. manufacturers who could export an environmentally beneficial product.

Ex-Im's response to a congressional financing mandate that is not directly related to environmental exports demonstrates that expansion of exports in a sector may involve the commitment of substantial resources within the bank. Ex-Im is mandated by Congress to make available not less than 20 percent of financing annually for the direct support of small business.²⁸

²⁷Ex-Im's charter requires the bank's board of directors to appoint a bank officer to promote renewable energy exports. The most recent board member in that role organized an intra-office group of Ex-Im officials, involved in and with some expertise in environmental export financing, called the Environmental Exports Team. The staff of the Office of Renewable Energy and Environmental Exports were part of this group as well as Ex-Im attorneys, engineers, project finance staff, policy planners, and credit and insurance underwriters. Most officials participating worked as needed on environmental exports transactions. The group met mainly to be briefed by staff on efforts to promote financing deals for renewable energy and environmentally beneficial exports. According to Ex-Im, the main achievement of the working group was to identify those in the bank with expertise on specific aspects of environmentally beneficial export transactions. When the board member left the bank in spring of 2009, the Environmental Exports Team ceased to meet regularly. The board position has been vacant since that time.

²⁸Related to Ex-Im's small business financing mandates are specific congressional directives concerning outreach activities to small businesses owned by socially and economically disadvantaged individuals and by women. In addition, there are mandates in other areas; for example, Ex-Im has been directed to take steps to expand its financial commitments in Sub-Saharan Africa. The Sub-Saharan Africa mandate does not have a specific financing goal. It has been assigned two staff.

Ex-Im has generally achieved the 20 percent small business mandate in recent years, and has allocated substantial resources to that effort. In addition to the 20 percent mandate, Congress, in Ex-Im's 2006 reauthorization, created a Small Business Division within Ex-Im. About 27 Ex-Im staff work directly to increase small business exports, most of them in Ex-Im regional offices.

Ex-Im's 2011 budget submission requests a funding increase for administrative expenses and additional staff positions, but does not specify where those positions would be added or whether any would be allocated specifically to environmental efforts. For fiscal year 2011, Ex-Im is requesting a 26 percent increase in its administrative budget, including staff, to \$105.6 million from \$83.9 million provided for fiscal year 2010. According to Ex-Im budget estimates, bank staff levels have decreased over 10 percent since fiscal year 2002 from some 401 full-time-equivalent staff to 358. The fiscal year 2011 administrative expense request includes \$5.2 million to address increased demand from U.S. exporters for Ex-Im financing by rebuilding staff levels, but does not specify the positions of the additional staff requested.

Conclusions

An increased focus on Ex-Im's financing of environmentally beneficial exports is reflected in recent congressional targets, beginning with the fiscal year 2008 target of 10 percent. Achieving that level of financing for environmentally beneficial exports overall could mean a more than fivefold increase by Ex-Im in such exports, since environmental goods and services represented just 1.3 percent of its overall financing in fiscal years 2003-2009. Moreover, Congress raised the bar for Ex-Im in its fiscal year 2009 appropriations when it modified the statutory target to focus more narrowly on financing of renewable energy technologies or energy efficient end-use technologies.

As Ex-Im seeks to achieve its environmental financing goal, it will likely face many challenges. Some may be to a large extent outside its control, such as financing incentives offered by other countries. Others are within the bank's control, including clearly communicating that its financing targets require substantial increases in certain areas, and determining how any additional resources could best be used to support potential exporters in this area. Ex-Im needs a clear strategy for meeting these challenges that is integrated into a broader strategy of the bank. We found that while Ex-Im has taken steps toward an environmental exports strategy, there are several ways in which its tracking, reporting, and planning could be improved.

By more clearly communicating what Ex-Im includes in its definition of certain environmentally beneficial exports—especially energy efficient end-use technologies—the bank could improve its ability to track and report on those exports and to provide information on its activities and goals, both within the bank and to other U.S. agencies, potential exporters, and Congress. Some terms are inherently difficult to define and have been used differently across U.S. government agencies. While Ex-Im has recently begun to track its energy efficient end-use financing internally, the energy efficiency technology examples it distributed publicly do not fully reflect the information that the bank uses in categorizing different types of energy efficiency exports. Congressional interest in this financing, along with terms that do not have consistent usage in general, make it important for Ex-Im to be clear with its own use of these terms.

With respect to the strategy itself, better communication of Ex-Im's environmental financing goals to the bank's stakeholders could enhance Ex-Im's efforts to achieve them. In addition, a full assessment of the adequacy of the bank's resources with respect to substantially increasing financing in this area is important for identifying gaps and moving to fill them. Ex-Im has not shown whether the increase in dedicated staff from one person to three since 2008 is sufficient for greatly expanded financing, or where current constraints or bottlenecks, if any, exist. The bank's fiscal year 2011 budget request asks for approval for an increased administrative budget to fund more staff positions. To effectively prioritize resources to increase certain environmentally beneficial exports requires a clear assessment of needs.

Increasing the share of Ex-Im's financing for renewable energy and energy efficient end-use exports to congressionally established target levels would represent a substantial increase in the bank's funding for those areas. How difficult it will be for Ex-Im to meet congressional targets with the resources within its control remains to be seen. However, by planning and using resources as effectively as it can to meet this challenge, Ex-Im can provide valuable information for this discussion with Congress and key stakeholders.

Recommendations for Executive Action

To improve the planning and reporting of its activities related to environmental exports, we recommend that the Chairman of the Export-Import Bank take the following steps:

- Develop and provide clear definitions for its subcategories of environmentally beneficial exports—especially energy efficient end-use

technologies—and report annually on the level of financing for each of the subcategories. These definitions should be developed in conjunction with other agencies as appropriate.

- Consistently implement key practices for effective strategic planning, including the following:
 - clearly communicating the bank’s priorities for increasing financing of renewable energy and energy efficient end-use technologies to both internal and external stakeholders, and soliciting input on how to do so;
 - demonstrating in the bank’s strategic planning documents a more complete and systematic assessment of external and internal factors affecting environmentally beneficial exports financing, such as market information for energy efficiency exports and the availability of needed Ex-Im services for exporters; and
 - using these assessments to determine the resources required and realign resources if needed.

Agency Comments and Our Evaluation

We provided a copy of this report to the Export-Import Bank. The bank provided written comments, agreeing with our findings and stating it will strive to implement our recommendations promptly. The bank also provided technical comments, which we included as appropriate.

We will send copies of this report to the appropriate congressional committees as well as the Chairman of the Export-Import Bank; the Secretaries of Agriculture, Commerce, Energy, and State; the Chairman of the U.S. International Trade Commission; the Office of the U.S. Trade Representative; and the Administrator of the Small Business Administration. If you or your staff have any questions about this report or need additional information, please contact me at (202) 512-4347 or yagerl@gao.gov. Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. GAO staff who made major contributions to this report are listed in appendix IX.

A handwritten signature in black ink, appearing to read "Loren Yager". The signature is fluid and cursive, with the first name "Loren" and last name "Yager" clearly distinguishable.

Loren Yager
Director, International Affairs and Trade

Appendix I: Objective, Scope, and Methodology

The objectives of this review were to examine (1) the extent of Ex-Im's financing in recent years of renewable energy, energy efficient end-use technologies, and other environmentally beneficial exports; (2) Ex-Im's definitions for, and its reporting on, renewable energy, energy efficient end-use technologies, and other environmentally beneficial exports; and (3) the extent to which Ex-Im has followed strategic planning key practices in its planning efforts in these areas.

To determine the extent of Ex-Im's recent financing for environmentally beneficial exports, including renewable energy and energy efficient end-use technology exports, we obtained financing and transaction data for fiscal year 2003 through fiscal year 2009 from Ex-Im. We used data from this period because significant changes to Ex-Im's data collection systems were introduced in 2003. We assessed the reliability of these data by comparing the data with Ex-Im's reported annual financing, examining individual transactions for consistency, reviewing data documentation, and interviewing officials responsible for collecting and analyzing the data. We found the data to be sufficiently reliable to report Ex-Im's total annual financing, and financing by instrument, for environmentally beneficial and renewable energy exports for fiscal years 2003 through 2009. To update financing information for the first two quarters of fiscal year 2010, we obtained transaction-level data for environmentally beneficial financing for these two quarters. In addition to the renewable energy subcategory information, these data included information on which exports were energy efficient end-use. We found these fiscal year 2010 financing data to be sufficiently reliable to report total annual financing, and financing by instrument, for environmentally beneficial, renewable energy, and energy efficient end-use exports.

For background and contextual purposes, we reported on Ex-Im's financing through the Environmental Exports Program (Appendix V) and the level and composition of Ex-Im's energy sector financing (Appendix II). To determine the extent of Ex-Im's financing under the enhanced incentives of Ex-Im's Environmental Exports Program, we obtained annual financing data for fiscal years 2003 through 2009 for environmentally beneficial exports and renewable energy exports that took advantage of the Environmental Exports Program. For the first half of 2010, the transaction-level environmentally beneficial financing data identified which transactions used the Environmental Exports Program enhancements. We assessed the reliability of this data by interviewing officials responsible for collecting and analyzing the data. To determine the level and composition of Ex-Im's energy financing, we obtained annual financing amounts for fiscal years 2003 through second quarter 2010 for

(1) fossil fuel extraction, transport and processing, (2) nuclear power production; and (3) fossil fuel production. We assessed the reliability of this data by performing consistency checks and comparing data to Ex-Im's reported annual financing. We found the above data to be sufficiently reliable to report Ex-Im's total annual financing through the Environmental Exports Program (appendix V) and Ex-Im's total annual energy financing (appendix II).

To determine how Ex-Im defines environmentally beneficial exports, renewable energy exports, and energy efficient end-use technology exports, we examined Ex-Im documents that demonstrate the types of exports that qualify as environmentally beneficial exports, renewable energy exports, or energy efficient end-use technology exports. We interviewed Ex-Im engineers and other officials involved with identifying and reporting the bank's environmentally beneficial export financing. We also interviewed officials from other U.S. government agencies, including the Departments of Agriculture, Commerce, Energy, State, and the Treasury; the International Trade Commission; the Overseas Private Investment Corporation; the Small Business Administration; the U.S. Trade and Development Agency; and the U.S. Trade Representative, to determine which terms they used to refer to environmental goods and services and how they defined those terms. In addition, we reviewed relevant legislation concerning climate change and U.S. energy policy which contained definitions or examples of terms for various environmental technologies.

To determine the extent to which Ex-Im followed strategic planning key practices, we consulted GAO work related to the Government Performance and Results Act (GPRA) of 1993, to identify strategic planning key practices.¹ This work identifies three steps for effectively managing for results: (1) defining clear missions and desired outcomes, (2) measuring performance to gauge progress, and (3) using performance information as a basis for decision making. We focused on the first step, defining clear missions and desired outcomes, because completion of this step is a prerequisite for completing the subsequent steps. There are three recommended key practices associated with the first step:

¹GAO, *Executive Guide: Effectively Implementing the Government Performance and Results Act*, [GAO/GGD-96-118](#) (Washington, D.C.: June 1996).

- Involving stakeholders in clarifying mission, priorities, and desired outcomes;
- Assessing the external and internal environment; and
- Realigning staff and resources to correspond with agency priorities.

We evaluated Ex-Im's strategic planning efforts and activities, including strategic planning documents such as the 2008 strategy for environmentally beneficial exports submitted to Congress, the Ex-Im fiscal years 2009 and 2010 Business Development Plans, and materials related to the draft 2010 Strategic Plan of the Export-Import Bank, to determine the extent to which they reflected these three key practices.

To determine the extent to which Ex-Im involved stakeholders in clarifying mission, priorities and desired outcomes, we first identified stakeholders such as other U.S. government agencies, state-level trade promotion offices, members of the environmental industry, and lenders. We selected specific stakeholders to interview based on the following criteria. For U.S. government agencies, we interviewed agencies that were either key members of the Trade Promotion Coordinating Committee (TPCC), had specific programs or initiatives related to renewable energy or energy efficiency, or had export-financing functions similar to those of Ex-Im. These government agencies included the Departments of Agriculture, Commerce, Energy and State; the Office of the U. S. Trade Representative; the Trade and Development Agency; the Overseas Private Investment Corporation; the Small Business Administration; and the International Trade Commission. We also spoke with the TPCC Secretariat. For state-level trade promotion offices, we interviewed several states, which we identified through discussion with the State International Development Organizations (SIDO), based, in part, on whether environmental exports were part of a state's export strategy. For environmental industry perspectives, we interviewed industry associations, as well as past and current members of the Ex-Im Advisory Committee who represented the environmental industry. For lenders, we interviewed current members of the Ex-Im Advisory Committee that represent the financial industry.

To determine the extent to which Ex-Im assessed the external and internal environment, we reviewed the 2008 strategy for environmentally beneficial exports submitted to Congress, the Ex-Im fiscal years 2009 and 2010 Business Development Plans, and materials related to the draft 2010 Strategic Plan of the Export-Import Bank to determine whether they

included (1) assessments of environmentally beneficial sector and country markets, capital and firm conditions, and policy considerations, and (2) internal organizational factors affecting overall financing. We also interviewed Ex-Im officials to determine the extent to which they conducted such assessments or obtained such assessments from other organizations. To assess the accuracy and completeness of information used by Ex-Im for strategic planning purposes, we interviewed several industry experts and private sector representatives; attended industry conferences, such as RETECH 2010 and the Environmental Industry Summit 2010; and reviewed key industry studies and data from, among others, the Department of Commerce and U.S. International Trade Commission; the Organisation for Economic Cooperation and Development; the World Bank; Environmental Business International, Inc.; and the American Council on Renewable Energy.

For contextual information on broad trends in production and trade in relevant industries and markets, we provided information in appendix VII and referred to it in the objective on assessing the internal and external environment. We obtained the production data from Environmental Business International, Inc. (EBI), which compiles the data through surveys of companies, models, and interviews. We discussed these data with EBI and Commerce and reviewed relevant documents describing the data. According to a Commerce official, the EBI production data is considered the most reliable available and Commerce uses it to indicate broad trends. However, due in part to challenges in industry and trade data classifications, the information should be considered estimates, indicative of broad themes and trends.

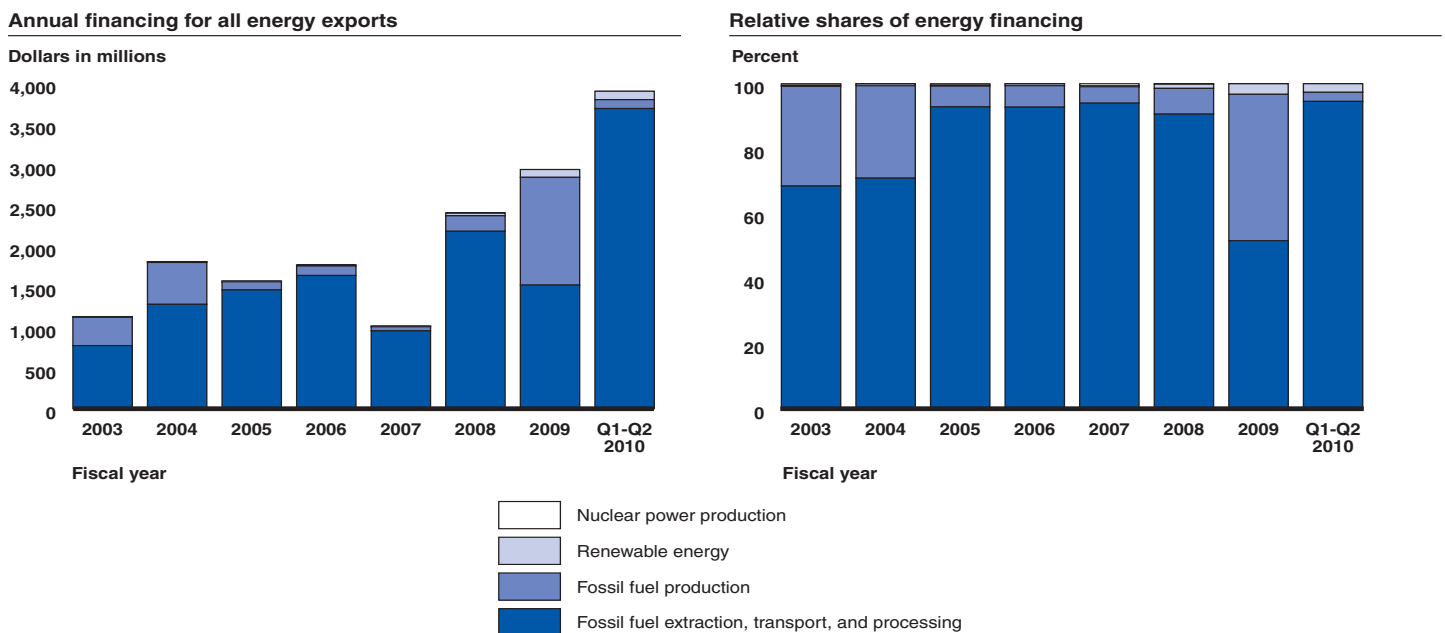
To determine the extent to which Ex-Im realigned staff and resources to correspond with agency priorities, we interviewed Ex-Im officials to determine the level of resources devoted to finding and processing transactions related to environmentally beneficial exports and how these resources have changed over time. We analyzed Ex-Im strategic planning documents, including the 2008 strategy for environmentally beneficial exports submitted to Congress, the Ex-Im fiscal year 2010 Business Development Plans, and materials related to the draft 2010 Strategic Plan of the Export-Import Bank, to determine the extent to which Ex-Im discussed realigning resources to respond to environmentally beneficial financing resource needs. We also reviewed Ex-Im's fiscal year 2011 budget request to assess whether Ex-Im was requesting new resources and whether it provided information on how the new resources would be utilized.

We conducted our audit work from August 2009 to July 2010 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe the evidence obtained provides a reasonable basis for our findings, conclusions and recommendations.

Appendix II: Ex-Im Energy Financing Levels and Composition

The level and composition of Ex-Im's overall energy financing, including the portion of the financing for renewable energy, has varied in recent years. The figure below shows the level of annual Ex-Im financing for energy exports, as well as the relative shares of fossil fuel production; fossil fuel extraction, transport, and processing; nuclear; and renewable energy in energy financing. In terms of total financing, fossil fuel-related exports averaged 13.0 percent of total Ex-Im financing for 2003-2009.

Figure 4: Ex-Im's Annual Energy Financing and Shares by Energy Type, Fiscal Year 2003 through the Second Quarter of Fiscal Year 2010



Source: GAO analysis of Ex-Im data.

Appendix III: Ex-Im's Description of Its Enhanced Due Diligence Process for High Carbon Intensity Projects

Ex-Im's Carbon Policy Implementation Plan includes a description of its enhanced due diligence process: The description is reproduced below. This appendix also includes information, provided by Ex-Im, on typical carbon dioxide emissions from thermal power plants.

Enhanced Due Diligence Process for High Carbon Intensity Projects

Ex-Im Bank will adopt a rigorous Enhanced Due Diligence Process to evaluate the environmental and climate change issues raised by high carbon intensity projects. The Bank recognizes that some projects may not be able to meet the environmental requirements set forth below and would be declined. Ex-Im Bank will approve an addendum to its Environmental Procedures and Guidelines setting forth the technical requirements for the Enhanced Due Diligence Process for all high carbon intensity projects. The Enhanced Due Diligence Process described below will apply to applications received after, or pending as of, March 9, 2010.

7. Fossil Fuel Projects Grouped by Carbon Intensity.

Ex-Im Bank's Engineering and Environment Division will calculate the estimated carbon intensity of all pending fossil fuel projects. Projects will be categorized based on their carbon intensity levels: Low, High, and Highest. The Bank will treat projects in each of the three categories differently.

Table 1: Ex-Im's Categories for Carbon Intensity and Bank Treatment

Category	Applicable Technologies	Ex-Im Bank Treatment
Group 1: Low Less than ~700 grams of CO ₂ /kWh ^a	<ul style="list-style-type: none"> IGCC (coal gasification) and IGCC-equipped as CCS-ready (Carbon Capture and Sequestration) Gas-fired power plants (simple cycle and combined cycle) Most oil-fueled power plants 	Standard review (e.g., no additional requirements)
Group 2: High Between ~700 and ~850 grams of CO ₂ /kWh ^a	<ul style="list-style-type: none"> Most coal and some inefficient oil-fueled power plants This includes some subcritical and most supercritical coal-fired power plants. It also includes some less efficient IGCC (coal gasification) power plants. 	Enhanced Due Diligence Process: <ul style="list-style-type: none"> Early Board review of CO₂ issues Alternatives Analysis Project must use the Best Appropriate Technology Project must fit within the country's approved Carbon Growth Strategy Discretionary imposition of additional requirements Preliminary environmental review fee assessed
Group 3: Highest More than ~850 grams of CO ₂ /kWh ^a	Includes the most inefficient coal-fired power plants (e.g., subcritical boiler plants)	Ex-Im Bank will require verifiable offsets reduce the project's CO ₂ intensity to a level that would fit within Group 2.

Source: Ex-Im Bank.

^aThese are representative benchmarks for fossil fuel power plants based on data from the Environmental Protection Agency and other sources. Emissions from most other industrial sectors fall below the carbon intensity limits for power production and are therefore not affected. Certain intensity benchmarks for other sectors such as cement plants will be developed within 6 months.

CO₂ is carbon dioxide. kWh is kilowatt hour. IGCC is integrated gasification combined cycle.

8. Enhanced Due Diligence Process for all High Carbon Intensity Projects

A. Early Board Review of Climate Issues:

As detailed below, staff will prepare an Enhanced Due Diligence Memorandum to the Board of Directors regarding a project's carbon dioxide intensity and issues related to climate change and the environment. Consistent with Section 11 of the Bank's Charter, the Board will either direct staff to proceed with processing the transaction or decline it for environmental considerations. This approach provides the Bank with a flexible, transparent process to review the environmental issues associated with high carbon intensity projects and, if appropriate, decline a transaction at an early stage due to its detrimental environmental effects. This process will commence after receipt of an application and all

necessary information set forth in Annex G of the Environmental Procedures and Guidelines. This review would precede the standard credit, legal and environmental reviews.

B. Requirements:

At a minimum, to be recommended to the Board of Directors, a high carbon intensity project must satisfactorily address the following requirements set forth in Annex G of the Environmental Procedures and Guidelines:

- Alternatives Analysis. The project must provide a satisfactory analysis of alternatives showing that the buyer considered a range of alternatives and chose the proposed project technology and fuel as the least cost alternative available.
- Best Appropriate Technology. The project must employ the best appropriate technology, taking into account the buyer and the country.¹ This analysis will include comparisons to other sources of power production in the country/region and the relative efficiency of selected technology.
- Low Carbon Growth Strategy. The host country shall have developed a Low Carbon Growth Strategy and the project must be consistent with the results and objectives of that strategy.²

C. Due Diligence Memorandum:

In addition to an analysis of the above requirements, the Enhanced Due Diligence Memorandum will include the following:

- Other Relevant Factors: An analysis of the following: the project's CO2 intensity as well as its annual and lifecycle CO2 emissions; discussion of CO2 and climate change issues relevant to the project; the existence of any carbon mitigation plan to reduce or offset emissions; evaluation of possible mitigation actions or offsets, and their costs; the potential impact for the exporter if the transaction is declined; financial considerations such as projections about regulation and compliance costs that could

¹This standard is more flexible than "best available technology," which may not be feasible from an economic, resource, or technological perspective in developing countries.

²This requirement relates to the World Bank initiative to assist countries in developing a framework for strategic, sustainable, and cost-effective low carbon growth the limits climate impacts.

affect the project's profitability; estimates of the social cost of carbon (using the U.S. government standards); brief overview of Ex-Im Bank portfolio of projects that emit CO₂; and other factors that would argue in favor of the project or against the project. It would also summarize any comments received from outside stakeholders, including non-governmental organizations.

- Options to Impose Additional Requirements. As part of the early Board review process, the Board will have the discretion to impose as a condition of its environmental approval (a) a fee increase or term reduction to increase the cost of Bank financing for the project, or (b) some degree of widely-accepted offset or mitigation measures to reduce the carbon intensity of the project. The Enhanced Due Diligence Memorandum will outline those options, and include an estimate of costs and other relevant factors.
- Staff Recommendations. The Due Diligence Memorandum will conclude with staff recommendations to the Board of Directors. This will include the Engineering and Environment Division's technical evaluation of the degree to which the project met the requirements set forth in Annex G of the Environmental Procedures and Guidelines and any additional requirements staff recommends the Board impose on the project as a condition of its approval.

D. Environmental Review Fee of 0.1%:

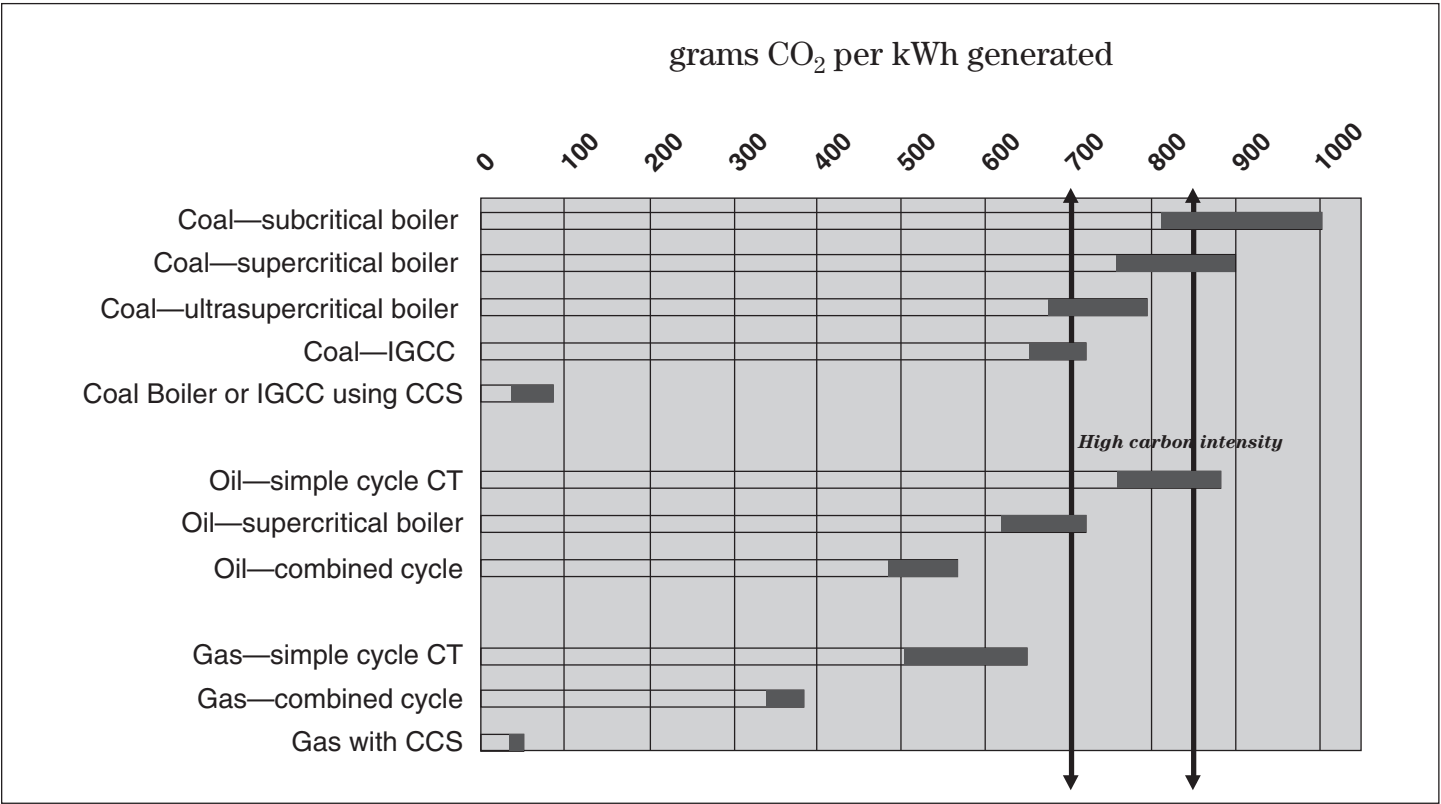
All high intensity carbon projects would be charged a preliminary environmental review fee of 0.1 %, up to \$25,000, to cover the cost associated with the Enhanced Due Diligence Process. If the Board directs staff to proceed with the transaction and later issues a final approval, the fee would be rebated. The amount of the fee and its treatment would be identical to those presently used for preliminary commitments.

E. Additional Mandatory Offset Requirement for Group III (Highest Carbon Intensity Projects):

The Bank will require verifiable offsets satisfactory to Ex-Im Bank of sufficient impact to reduce the CO₂ intensity of the transaction to a level that would fit within Group II. Ex-Im Bank will provide guidance on the scope of acceptable offsets, which could include retrofitting inefficient boilers, efficiency improvements, and renewable energy projects. The Enhanced Due Diligence Memorandum will include the Engineering and Environment Division's determination as to whether the buyer meets the offset requirement.

Ex-Im provided us a graphical depiction of the intensity of carbon dioxide emissions for different types of thermal power plants relative to the benchmarks in the Carbon Policy Implementation Plan. See fig. 5.

Figure 5: Typical Carbon Dioxide Emissions from Thermal Power Plants with Proposed Benchmarks for Carbon Dioxide Intensity



Source: Ex-Im's Engineering and Environment Division estimates compiled from World Bank, U.S. Environmental Protection Agency, and supplier data.

Note: CO₂ is carbon dioxide. kWh is kilowatt hour. IGCC is integrated gasification combined cycle. CCS is carbon capture and storage. CT is combustion turbine.

Appendix IV: Ex-Im Bank Incentives for Environmental Exports

Under its Environmental Exports Program, Ex-Im offers enhanced financing terms for environmentally beneficial goods and services. The specific elements of the enhanced terms under the Environmental Exports Program reflect in part international negotiations on terms for export credits, carried out in the OECD. For example, renewable energy and water treatment exports are eligible for up to 18-year repayment terms, in contrast to the maximum 10-12 years available for standard equipment sales or non-nuclear power plants, respectively, under normal Ex-Im financing. Renewable energy and water exports had been eligible for up to 15-year repayment terms since July 2005. In July 2009, the OECD approved extending terms for these exports to up to 18 years, in an effort to increase the utility of the enhanced financing. Further, negotiations are underway to apply the enhanced terms to a group of exports characterized as "climate change technologies."

According to U.S. officials, the OECD is currently working to resolve (1) which technologies warrant enhanced terms—both from a political and from a technical perspective—and (2) what standards could be used to determine eligibility. On-going discussions are addressing: (1) whether such support should be offered to technologies that are being developed to reduce carbon emissions, such as two technologies related to coal: integrated gasified combined cycle, and carbon capture and storage and (2) what technical standards could be used to determine energy efficient technologies against a backdrop of multiple baselines that could be used to calculate efficiency gains.

In March 2010, Ex-Im announced three additional incentives for renewable energy exports as part of its Carbon Policy Implementation Plan (see below).

- A "Solar Express" program to provide special, expedited consideration and approval to small solar export deals that are valued between \$3 million and \$10 million. Ex-Im is implementing the program in response to increased application volume for these small solar export projects.
- The option to pay exposure fees over time, as part of the interest margin paid on the loan, instead of up front, for renewable energy projects.¹ According to Ex-Im, this option will reduce the financing burden for exporters taking advantage of long loan terms. This will help their ability

¹The exposure fee is Ex-Im's charge for a transaction that covers the risk associated with financing. It varies by, among other factors, the importing country, the length of the repayment terms, and the loan coverage.

to compete in markets with high exposure fee rates. Typically, exposure fees are collected by Ex-Im up front and can subsequently be folded into the financing amount of the loan. For long-term loans in high-risk markets, these exposure fees can become prohibitively costly, so borrowers would see a very high fee to be paid up front. According to Ex-Im, most other export credit agencies already allow buyers to pay the fee as part of the interest margin and avoid the sticker shock of having to pay the fee up front.

- Allow qualifying renewable energy exporters flexibility to lock the Commercial Interest Reference Rates (CIRR) at the time of Ex-Im Board approval, rather than disbursement.² According to Ex-Im, locking the rate at approval rather than the time of disbursement will increase exporter certainty regarding the financing cost of the transaction.

See table 2 below.

²The CIRR is the official lending interest rate for export credit agencies. For the United States, the CIRR is based on the treasury bond rate.

Table 2: Environmental Exports Program Enhancements of the Standard Ex-Im Financing Options

Ex-Im financial product	Standard	Environmental Exports Program
Loan and Guarantee Program Maximum repayment terms	Depends on size of the transaction (dollar value) and nature of export, with maximum of: 10 years for all technologies 12 years for energy producing	Up to 18 years for potable water and renewable energy Standard terms for all other categories of environmentally beneficial exports
Loan and Guarantee Program Special features	Not available	For renewable energy transactions (introduced as part of the Carbon Policy Implementation Plan): Option for exposure fee to be paid over the entire repayment period (e.g., as part of the interest margin) For direct loans, option to fix CIRR rate at approval “Solar Express” program for small structured photovoltaic deals (lowers transaction costs as compared with standard project finance)
Local cost coverage	Thirty percent of the U.S. contract price (automatic for medical equipment, products related to U.S. transportation security or foreign transportation security projects and project finance transactions; but any project can apply). There are eligibility criteria that must be met.	Thirty percent of the US contract price (automatic)
Capitalization of interest during construction	Yes, but not automatic unless project finance.	Yes (automatic)
Working Capital Guarantee	Working Capital Guarantee loans are commercial bank loans to allow U.S. exporters to purchase finished products for export; pay for raw materials, equipment, supplies, labor, and overhead to produce goods and/or provide services for export; cover standby letters of credit serving as bid bonds, performance bonds, or payment guarantees; or finance foreign receivables. Coverage: typically 90 percent. Terms: from 1 up to 3 years. Collateral: export-related accounts receivable and inventory (including work-in-process) tied to an export order.	Working Capital Guarantee loans are commercial bank loans to allow U.S. exporters to purchase finished products for export; pay for raw materials, equipment, supplies, labor, and overhead to produce goods and/or provide services for export; cover standby letters of credit serving as bid bonds, performance bonds, or payment guarantees; or finance foreign receivables. Coverage: typically 90 percent. Terms: from 1 up to 3 years. Collateral: export-related accounts receivable and inventory (including work-in-process) tied to an export order.

**Appendix IV: Ex-Im Bank Incentives for
Environmental Exports**

Ex-Im financial product	Standard	Environmental Exports Program
Short-Term Insurance Coverage	Typically 95% of principal.	Typically 95% of principal.
Short-term Insurance Special features	Standard Short-Term Multi-Buyer Policy: Not available	Environmental Small Business (ENV) Short-Term Multi-Buyer Policy: No deductible Enhanced assignment of receivables ENV policyholders do not “graduate” from the program even if their export credit sales exceed \$7.5 million.
Medium-Term Insurance Coverage	100 percent of principal for political and commercial risk.	100 percent of principal for political and commercial risk Can offer extended insurance tenors (in theory, up to 18 years) that are not available under the standard programs. (Ex-Im Bank does not offer a long-term insurance program.)

Source: GAO analysis of Ex-Im documents and discussions.

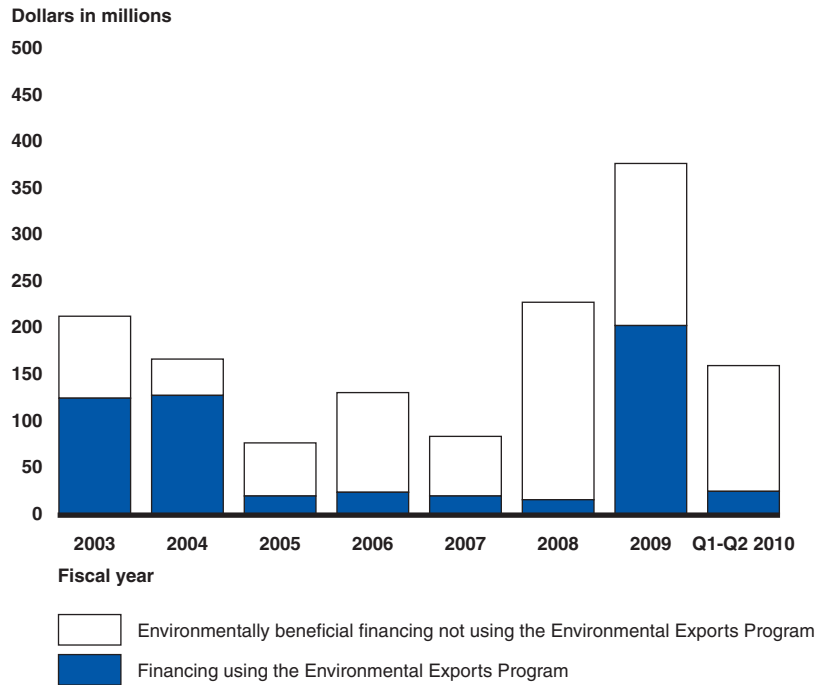
Appendix V: Data on Usage of Ex-Im's Financing under Its Environmental Exports Program

According to Ex-Im data, 39 percent of financing that it classified as environmentally beneficial from fiscal year 2003 through the second quarter of fiscal year 2010 used incentives under Ex-Im's Environmental Exports Program. Ex-Im's Environmental Exports Program includes a number of enhanced incentives depending on the financing instruments.

The enhancements under the program are not all applicable across all types of Ex-Im financing instruments. For example, the enhancements apply only to loans and guarantees for international buyers, and to insurance for small businesses. Beyond the special features for renewable energy in Ex-Im's 2010 Carbon Implementation plan, there are no enhancements for working capital, or insurance to medium and large exporters.

For exports that qualify for enhanced incentives, the individual exporter decides whether to accept the Environmental Exports Program enhanced financing terms. Some customers choose not to take advantage of the Environmental Exports Program enhancements. This could be the case, for example, with exports to some developing countries, because the longer financing terms that the program offers would result in higher exposure fees, under Ex-Im's risk-based exposure fee system. According to Ex-Im, recent enhancements that can delay the payment of fees may mitigate these higher exposure fees in some cases. Figure 6 shows the share of the financing that Ex-Im has classified as environmentally beneficial that has made use of the enhanced financing terms under Ex-Im's Environmental Exports Program.

Figure 6: Annual Financing under Ex-Im's Environmental Exports Program as a Share of Ex-Im's Total Annual Environmentally Beneficial Financing, Fiscal Year 2003–Second Quarter Fiscal Year 2010



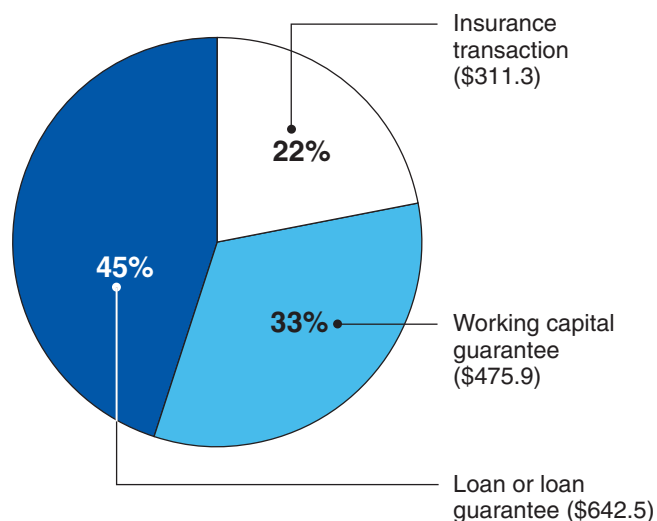
Source: GAO analysis of Ex-Im Bank data.

Appendix VI: Additional Detail on Financing Instruments Used for Ex-Im's Environmentally Beneficial Exports

Ex-Im uses three financial instruments to finance environmentally beneficial and renewable energy exports: loan guarantees, insurance, and working capital. The relative size and volume of transactions that Ex-Im completes vary by instrument. While Ex-Im has authorized 41 loan guarantees between 2003 and the second quarter of 2010, these transactions represent 45 percent of Ex-Im's environmentally beneficial financing. Over the same period, Ex-Im financed 100 working capital guarantees, representing 33 percent of environmentally beneficial export financing. The average size of an export insurance transaction is relatively small. Insurance represents 22 percent of financing in the case of both the environmentally beneficial category and the renewable energy subcategory, but over half of Ex-Im's financing transactions for each group. (See fig. 7.)

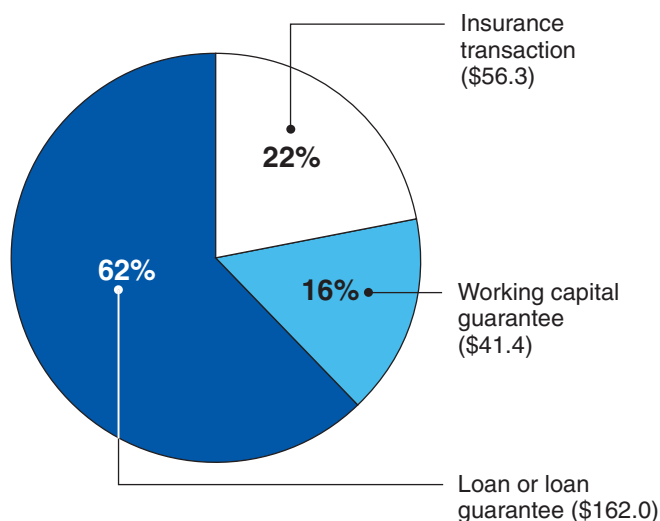
Figure 7: Ex-Im Environmentally Beneficial Financing and Renewable Energy Financing by Instrument, Fiscal Year 2003–Second Quarter, Fiscal Year 2010

Environmentally beneficial exports



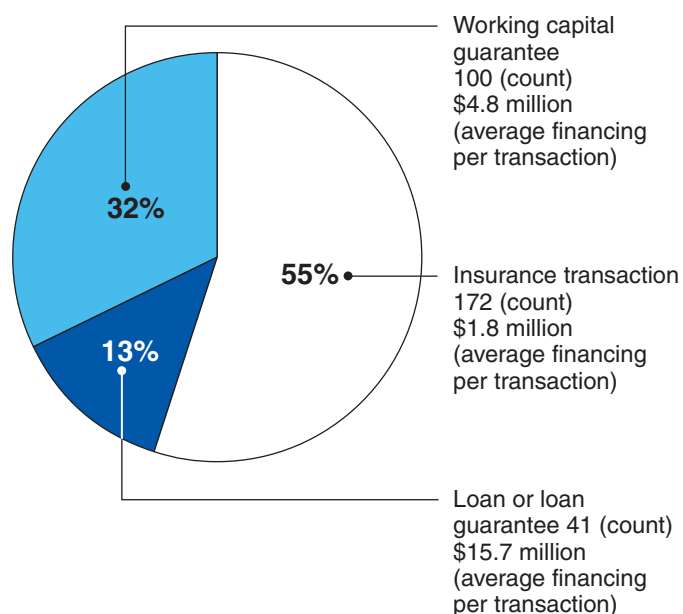
Total financing (dollars in millions)

Renewable energy exports

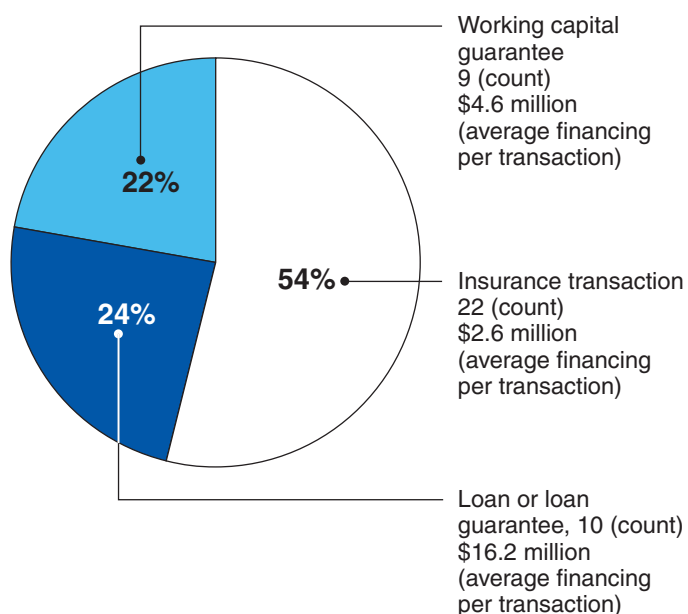


Total financing (dollars in millions)

Environmentally beneficial exports transaction count



Renewable energy exports transaction count



Source: GAO analysis of Ex-Im Bank data.

Appendix VII: Additional Market Information on Environmentally Beneficial Production and Trade

Analyses of global markets indicate that production and trade in environmentally beneficial goods and services are growing worldwide. Increasing global energy demand is an important driver of this growth. According to estimates from the International Energy Agency, an additional \$26 trillion in new global investment will be needed to meet current energy demand until 2030, of which a rising portion will likely be in renewable energy and energy efficient products and services. Export opportunities may grow further as a result of liberalization of trade through bilateral and regional free trade agreements.

Measurements of production and trade trends in environmentally beneficial goods and services depend on what products are included. One market estimate of production and trade that has been used by the Department of Commerce is the estimate of “environmental technologies” based on data from Environmental Business International, Inc. (EBI). EBI measures the size of the environmental industry as all revenues earned from the sale of equipment, services, and resources associated with environmental protection assessment, compliance with environmental regulations, pollution control, waste management, remediation of contaminated property, and the provision and delivery of environmental resources.¹ A few studies have also referred to market estimates of “environmental goods,” based on efforts within the World Trade Organization to reach consensus on a list of environmental products.² Such consensus has not yet been reached. In April 2007, a group of member countries submitted a list of 153 environmental goods for discussion, and in December 2007, the United States and the European Union proposed a smaller list of 43 products that had been identified by the World Bank as climate friendly. More recently, the Department of Commerce has published a study estimating the value of the U.S. green economy based on 2007 census data, with a product or service considered green if it conserves energy or natural resources or reduces pollution.

¹EBI generates its estimates by adding revenues generated by entities within 14 segments of the environmental industry that it has identified. EBI relies on information from company databases it has constructed, proprietary survey instruments, market models, and editorial research. EBI’s categorizations and market estimates of the environmental industry are used by the Department of Commerce and, according to EBI officials, have been used or adapted by the Organisation for Economic Cooperation and Development, the European Union, and numerous other government and private sector sources.

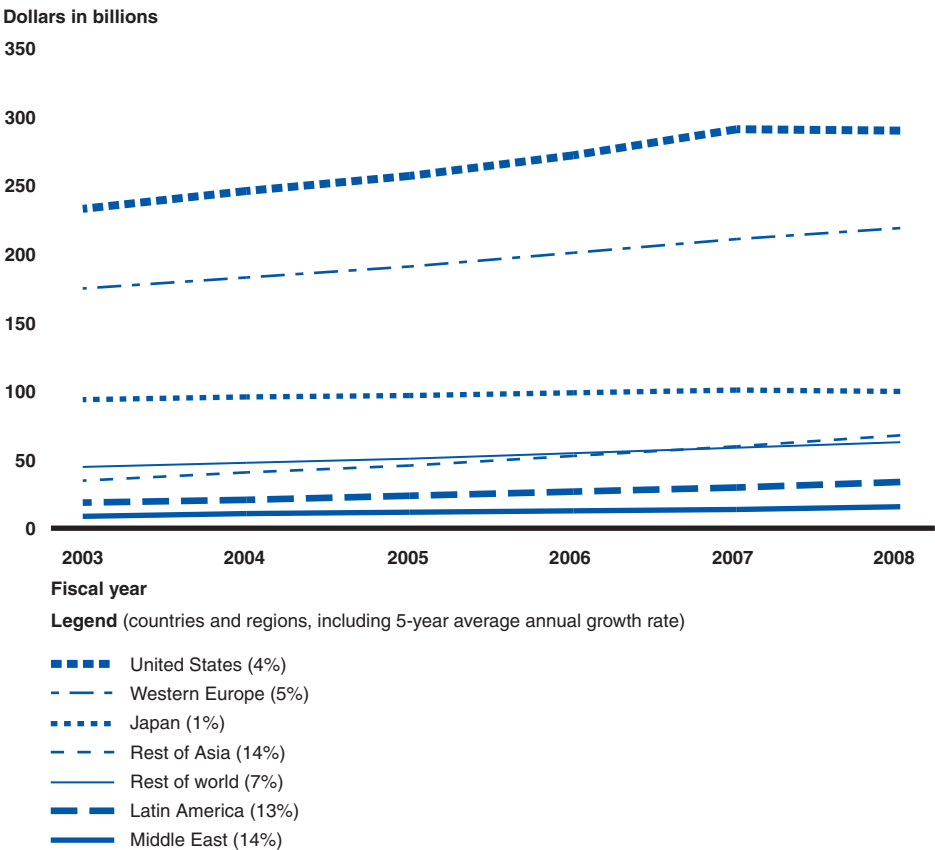
²One example is the U.S. Senate Special Report, “Major Opportunities and Challenges to U.S. Exports of Environmental Goods,” Senator Ron Wyden, Washington, D.C.: December 9, 2009.

Given the lack of consensus on the definition of environmental goods and the availability of multiyear environmental data, the information that follows is based on Commerce's definition of environmental technologies using data from EBI. However, given definitional uncertainties discussed in the body of this report, and resulting limitations with industry and trade data classifications, the information in this appendix should be considered as estimates that can be indicative of broad trends. Additional data and greater understanding of the definitions of environmentally beneficial exports would be helpful not only for Ex-Im and the banks that are conducting outreach to industry, but also to Congress and other policy makers who may be considering other actions to encourage U.S. production or exports of these products and services.

U.S. Production of Environmental Technologies Is Estimated at about \$290 Billion

According to EBI industry data, global production of environmental technologies in 2008 was estimated at around \$780 billion. The United States was estimated to be the largest producer worldwide, with production in 2008 at around \$290 billion. While Western Europe and Japan were also large producers, the fastest growing regions for production were in the rest of Asia, Latin America, and the Middle East. (See fig. 8)

Figure 8: Estimated Environmental Technology Production by Country and Region, 2003-2008



Source: GAO analysis of environmental industry data from Environmental Business International, Inc.

Note: Production estimates are based on industry revenues associated with environmental protection, assessment, compliance with environmental regulations, pollution control, waste management, remediation of contaminated property, and the provision and delivery of environmental resources.

Production differences across countries are widely considered to reflect in part effects of national incentives promoting environmental technologies. For example, the presence of environmental regulations that require investments in goods and services that prevent, remediate, or alleviate environmental degradation encourage environmental technology production. According to Commerce, the United States has a relatively strong regulatory environmental regime with domestic laws that include, for example, the Clean Air Act and the Clean Water Act. Commerce notes, however, that there has been some weakening of these two acts over the past few years. Another key factor is the existence of renewable energy

incentives such as feed-in tariffs and renewable portfolio standards.³ In the United States, GAO has found that production incentives and tax credits for renewable energy have been instituted at the state and federal levels, but their impact has varied depending on the amount and certainty of initiatives. Lack of consistency and stability in U.S. renewable energy incentives required for long-term investment is a constraint that has been commonly identified by experts and industry studies. Experts have also observed that, compared with those in the United States, foreign country incentives targeting renewable energy may often be more robust. For example, the European Union has mandated that utilities source 20 percent of their energy from renewable sources by the year 2020, and the Chinese government has spent an estimated \$1.5 billion promoting the competitiveness of its solar industry.

U.S. Water and Waste Sector Production Accounts for over 60 Percent of Estimated U.S. Environmental Production

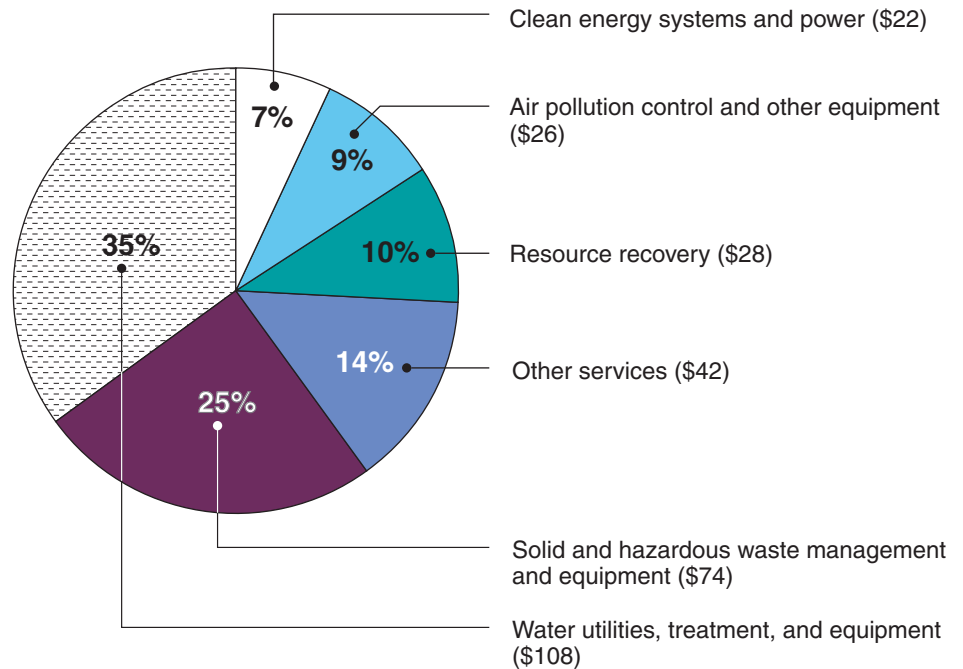
According to EBI industry data, the largest sources of U.S. production of environmental technologies in 2008 were goods and services for water utilities, treatment, and equipment and for solid and hazardous waste management and equipment. At a value of over \$180 billion, production in these two areas accounts for over 60 percent of total U.S. output of estimated environmental technology goods and services. (See fig. 9.) Renewable energy and energy efficient goods production estimates are included within the slice entitled “Clean energy systems and power.” At a value of \$22 billion, these products and services account for about 7 percent of total U.S. production.⁴

³Feed-in tariffs allow owners of renewable energy technologies to sign long-term contracts for the sale of the power they produce back to utilities.

⁴Ex-Im’s 2010 Business Development Plan for Environmentally Beneficial Exports indicates that global renewable energy production grew significantly from 2005 to 2008, with grid-connected solar photovoltaic capacity increasing by 600 percent to 13 gigawatts and wind power capacity increasing 250 percent to 121 gigawatts.

Figure 9: Estimated U.S. Environmental Technology Production, 2008

Dollars in billions



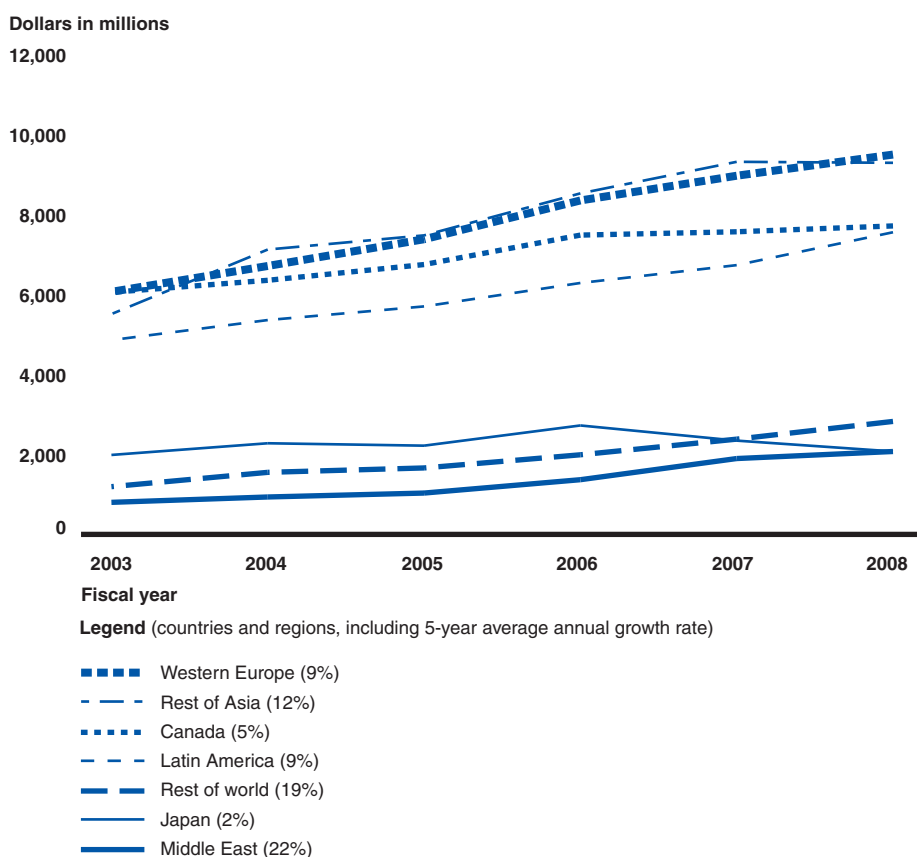
Source: GAO analysis of environmental industry data from Environmental Business International, Inc.

Note: U.S. production estimates are derived from revenues generated by U.S. companies worldwide. Resource recovery is defined as selling materials recovered and converted from industrial byproducts or postconsumer waste. Clean energy systems and power is defined as selling power and systems in solar, wind, geothermal, small-scale hydro, energy efficiency, demand response, and smart-grid systems.

U.S. Environmental Technology Exports Are Growing, Particularly to Markets in Asia and Latin America

Official U.S. data suggest that the United States exported just over \$40 billion in environmental technologies in 2008, a value equal to about 14 percent of total U.S. environmental technology production. In 2008, the largest country markets by share of U.S. exports were Canada (19 percent), Mexico (12 percent), China (8 percent) and Germany (7 percent). Regionally, two of the larger and faster emerging growing market areas are Asia (outside of Japan) and Latin America. Over a 5-year period, for example, export growth was estimated to be 23 percent to China, 29 percent to India, 25 percent to Brazil, and 40 percent to Venezuela. Other large and fast-growing markets include those in Australia, Russia, Saudi Arabia, and the United Arab Emirates. (See fig. 10.)

Figure 10: Estimated U.S. Environmental Technology Exports by Country and Region, 2003-2008



Sources: GAO analysis of data from the U.S. Department of Commerce and the United States International Trade Commission.

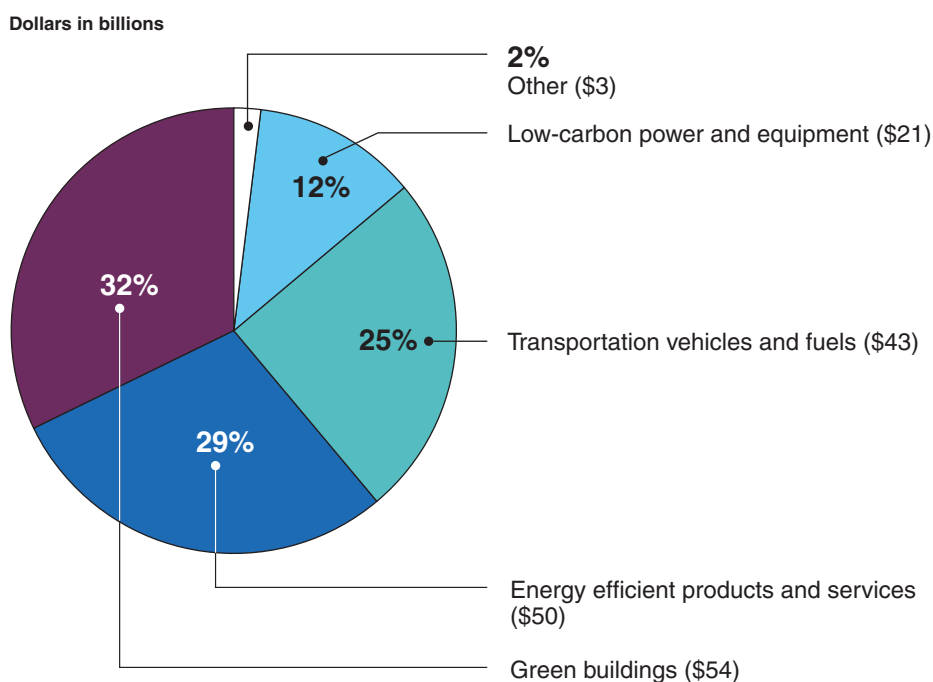
Compared with the United States, several foreign competitors export a larger share of their environmental technology production. For example, estimated exports as a share of production exceed 20 percent for each of Japan, Germany, France, and the United Kingdom. While Commerce officials emphasize that opportunities for growth in U.S. exports exist, particularly to developing countries, several challenges persist:

- *Trade tariffs:* Trade in environmental technologies is governed by relatively high trade tariffs—averaging 15 percent to 20 percent—in some major emerging markets. In some key markets, trade tariffs can be as high as 40 percent.
- *Nontariff barriers:* Trade in environmental technologies is also governed by numerous nontariff barriers, including restrictive technical standards, packaging, and documentation requirements; nontransparent government procurement; and restrictions on investment and ownership. China, for example, requires that wind and other energy efficient projects use 80 percent locally produced content.
- *Tied aid:* Trade in environmental technologies often occurs under tied-aid arrangements, which are government-to-government concessional financing of projects in developing countries that are linked to the procurement of goods and services from donor countries. Commerce officials report that the United States has had a disadvantage competing with member states of the European Union, Japan, and Australia, for example, which provide significant tied aid in environmental technologies. The OECD reports that from July 2005 to June 2008, there was a total of \$2.15 billion in tied aid provided for renewable energy projects.

U.S. Climate Change Production Is Estimated at About \$170 Billion

In addition to providing data on the environmental industry, EBI has recently issued an estimate of the 2008 value of U.S. climate change production. EBI defines climate change industry as products and services for green building design and development, energy efficient products and services, low-carbon power and equipment, consulting, engineering and other services, and other products supporting carbon capture and storage, energy storage, and adaptation. According to EBI, the United States produced \$170 billion worth of goods and services, primarily in the green buildings sector, energy efficiency, and transportation vehicles and fuels. Renewable energies would be included within the segment entitled “Low-carbon power and equipment,” with a total estimated value of around \$21 billion in 2008. (See fig. 11.)

Figure 11: Estimated U.S. Climate Change Industry Production by Sector, 2008



Source: GAO analysis of data from Environmental Business International, Inc.

Note: Green buildings includes building design, construction and contracting, development and materials, as well as devices for energy efficiency and water conservation. Energy efficient products and services includes systems, equipment and appliances, and energy audits and studies to support energy efficiency and demand response. Low carbon power and equipment includes renewable and conventional equipment and power sales, project design, and project development. Other includes carbon capture and storage, energy storage, adaptation, carbon market services, and other consulting, engineering, and research services.

Sector Example: Solar Photovoltaics

Global solar energy production is a fast-growing sector that is expected to continue to expand into the future. Two solar power technologies widely employed today include solar photovoltaic (PV) and solar thermal.⁵ In its latest environmental business development plan, Ex-Im emphasizes that solar PV, in particular, is the world's fastest-growing energy source and

⁵Solar photovoltaic technologies convert sunlight into electricity through arrays of semiconductor devices called solar cells. Solar thermal technologies (concentrated solar power systems) use highly reflective sun tracking mirrors to produce high-temperature thermal energy.

that PV panel production has been doubling every 2 years from 2002 to 2008. According to a recent industry estimate for 2009, the solar PV industry generated an estimated \$38 billion in global revenues and PV cell production reached 9.34 gigawatts, a 36 percent increase over the 6.85 gigawatts produced in 2008. Of that amount, 18 percent was for thin-film cell production, a new generation of potentially lower-cost technologies.

According to Ex-Im's business development plan and industry sources, China was the largest producer of solar PV cells in 2008, followed by Germany, Japan, Taiwan, and the United States. China and Taiwan continued to build market share and now account for nearly half of global PV cell production. China also now exports about 98 percent of what it produces.

Although U.S. production of all solar PV cells ranked fifth overall, its production of thin-film solar cells was the largest, and thin-film technologies are beginning to meet a greater share of global demand. According to industry estimates, while the United States currently accounts for about 10 percent of world PV cell production, this share could reach 20 percent to 25 percent by 2013 in part because of the employment of new PV technologies.

As with other renewable energy technologies, PV cell production trends in part reflect the presence of strong production incentives. Industry estimates suggest that 60 percent to 70 percent of world PV cell production is expected to occur in China, in part because of significant domestic incentives that are part of a "comprehensive" policy of tax rebates, financial incentives, and strong targets. Experts estimate that the Chinese government has spent \$1.5 billion to promote the competitiveness of its solar industry. In the United States, incentives at the state level have also been important for encouraging production. Commerce also notes the potential for clean energy cooperation between the United States and China, with efforts in the area of training and capacity building.

Appendix VIII: Comments from the Export-Import Bank



EXPORT-IMPORT BANK
OF THE UNITED STATES

FRED P. HOCHBERG

CHAIRMAN & PRESIDENT

June 11, 2010

Loren Yager
Director, International Affairs and Trade
U.S. Government Accountability Office
Washington, DC 20548

Dear Mr. Yager:

Thank you for providing the Export-Import Bank of the United States ("Ex-Im Bank") with the opportunity to comment on GAO's June 2010 draft report entitled "Export-Import Bank: Reaching New Targets for Environmentally Beneficial Exports Presents Clear Challenges for Bank." I appreciate the time and effort GAO put into developing the report, and the Bank will strive to implement GAO's recommendations promptly.

Ex-Im Bank is committed to promoting the export of renewable energy and energy efficiency end-use technologies, as well as other environmentally beneficial goods and services, thereby growing and sustaining green jobs in the U.S.

The Bank's efforts to promote renewable energy exports produced more than \$100 million in support for renewable energy exports in FY2009, more than triple the amount authorized in FY2008 for this sector. During FY2010, Ex-Im Bank has already approved \$82 million for wind and solar power exports, and is currently reviewing twelve renewable energy transactions with export values ranging from \$280,000 to \$195 million.

Ex-Im Bank is also proud to be the first export credit agency to approve a Carbon Policy addressing global climate change. The policy establishes financial incentives for renewable energy transactions, aims to reduce CO2 emissions by encouraging energy efficiency exports, and requires enhanced due diligence for high carbon intensity projects. Ex-Im Bank was the first – and remains the only – export credit agency to track and publically report the CO2 emissions associated with the projects it supports. In March 2010, Ex-Im Bank launched the Solar Express program to expedite solar-power transactions valued between \$3-\$10 million.

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EXPORT-IMPORT BANK
OF THE UNITED STATES

FRED P. HOCHBERG

CHAIRMAN & PRESIDENT

As the report makes clear, external factors pose a significant challenge to U.S. exporters of environmentally beneficial goods and services, which affects Ex-Im Bank's ability to meet its 10% goal for renewable energy and energy efficiency end-use technology authorizations. Ex-Im Bank is a demand-driven institution, and demand for U.S. exports and Ex-Im Bank financing is primarily a function of cost. As noted in the report, many countries protect their markets through tariff and non-tariff barriers and provide incentives and subsidies to domestic industries; an imbalance which cannot be addressed by Ex-Im Bank. Ex-Im Bank is also at a disadvantage with respect to competing against countries offering concessional or subsidized financing for renewable energy exports (also known as "tied aid"). Lastly, renewable energy technologies continue to have an inherent disadvantage compared to fossil fuel-based projects based on the cost of power production.

Nonetheless, Ex-Im Bank is confident that its efforts to increase support for renewable energy and energy efficiency end-use technology exports will result in a corresponding increase in FY2010, moving closer to the 10% target. Ex-Im Bank commits to expanding its efforts through developing and implementing operational efficiencies to better focus on the needs of the renewable energy sector. The Bank will continue to improve its outreach to renewable energy and energy efficiency exporters, buyers and lenders; increase its coordination with other trade promotion agencies at both the national and state level, including the Trade Promotion Coordination Committee's Clean Energy Working Group; expand its engagement with stakeholders, including environmental non-governmental organizations; develop new programs and incentives for renewable energy and energy efficiency exports; and increase Ex-Im Bank's resources dedicated to these efforts.

Sincerely,

A handwritten signature in dark ink, reading "Fred P. Hochberg". The signature is fluid and cursive, with the first letters of the first and last names being capitalized and prominent.

Fred P. Hochberg
President and Chairman

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Appendix IX: GAO Contact and Staff Acknowledgments

GAO Contact

Loren Yager (202) 512-4347 or yagerl@gao.gov

Staff Acknowledgments

In addition to the contact named above, Celia Thomas (Assistant Director), Eugene Beye, Adam Cowles, David Dornisch, Kendall Helm, Ernie Jackson, Giulia McHenry, and Jennifer Young made key contributions, and Karen Deans, Etana Finkler, and Armetha Liles provided technical support.

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