

Five-Year
Strategic Plan
of the
Clean Energy
Technology Exports
Initiative

Table of Contents

<i>Executive Summary</i>	.....	i
<i>CETE Strategic Plan</i>	.....	1
I. Introduction	.....	1
II. Definitions	.....	2
III. Mission	.....	2
IV. Vision	.....	2
V. Challenges	.....	3
VI. Current Needs and Resources	.....	5
VII. Objectives	.....	8
VIII. Strategies	.....	8
IX. Program Elements and Project Criteria	.....	9
X. Measuring Progress	.....	10
XI. Implementation	.....	11
<i>Appendices</i>	.....	13
A. Industry Meetings	.....	13
B. Perspective	.....	15
C. Dimensions of CETE	.....	17
D. Illustrative CETE Activities	.....	18
E. USAID Report	.....	25
F. Acronyms	.....	27
G. Reference Documents	.....	28

EXECUTIVE SUMMARY

CETE Strategic Plan

The FY 2001 Report of the U.S. Senate Appropriations Committee on the Energy and Water Development Bill, directed the formation of an interagency Working Group to improve the federal government's role in promoting exports of clean energy technologies, working in collaboration with U.S. industry (see Box 1). The Administration expressed support for this initiative in its National Energy Policy report (see Box 2 on next page).

The Senate Report requested the preparation of a five-year strategic plan for a clean energy technology exports (CETE) program and annual status reports. Accordingly, this strategic plan outlines a program to increase U.S. clean energy technology exports to international markets through increased coordination among federal agency programs and between these programs and the private sector. Within existing resources, CETE will help to catalyze, facilitate, and support an expansion of clean energy technology use in developing countries and countries in transition while increasing the value of U.S. clean energy technology exports to these markets. Increased application of these clean energy technologies will also assist countries in addressing climate change.

Box 1. The Report of the FY 2001 U.S. Senate Appropriations Committee on the Energy and Water Development Bill:

“The Administration should improve the Federal Government’s role in the national and international development, demonstration, and deployment of advanced clean energy technologies by establishing an interagency working group jointly chaired by the Departments of Energy and Commerce and the U.S. Agency for International Development. This working group should also include representation from the Departments of State and Treasury, Environmental Protection Agency, Export-Import Bank, Overseas Private Investment Corporation, Trade and Development Agency, and other departments and agencies, as appropriate. The Administration should also consult with the private sector and other interest groups on the export and deployment of clean energy technologies through the establishment of an advisory panel. Progress on the international deployment of clean energy technologies should be reported annually to Congress by March 1. The Administration should analyze technology, policy, and market opportunities for further international clean energy program development and provide Congress a 5-year strategic plan by June 1, 2001. This plan should be developed in consultation with the advisory panel.”

The CETE vision addresses three major challenges in U.S. global energy policy: competition in developing markets, environmental sustainability, and energy security. CETE will help the United States increase its market share for energy technologies where that share is now low, and maintain market share and increase market size where the current U.S. share is high. By encouraging the adoption of clean energy technologies in developing countries, CETE can encourage environmentally sustainable growth in these markets, which can help address local pollution levels and reduce the emission of greenhouse gases. U.S. exports of clean energy technologies will also improve U.S. energy security by increasing global energy supply, diversifying energy sources, and reducing global consumption through more efficient technologies.

In addressing these challenges, the mission of CETE is to increase U.S. clean energy technology exports. Its objectives are to strengthen the institutional foundations for clean energy technologies in international markets, to accelerate the use of clean energy technologies in those markets, and to substantially increase U.S. market shares in growing clean energy technology markets in ways that minimize cost and risk to U.S. taxpayers. The performance of the program will be measured by metrics developed by the CETE Working Group, such as percent increase in the dollar value of clean energy exports per Federal dollar invested, increase in the U.S. share in selected global clean energy technology markets per Federal dollar invested, and increase in the proportion of energy provided by clean energy technologies in selected key developing countries per Federal dollar invested.

Box 2. The Report of the National Energy Policy Development Group, May 2001 – Recommendation 8-15:

“The National Energy Policy Development Group recommends that the President direct the Secretaries of Commerce, State, and Energy to promote market-based solutions to environmental concerns; support exports of U.S. clean energy technologies and encourage their overseas development; engage bilaterally and multilaterally to promote best practices; explore collaborative international basic research and development in energy alternatives and energy efficient technologies; and explore innovative programs to support the global adoption of these technologies.”

CETE represents a multi-agency, senior-level partnership that combines the resources of the U.S. federal government and the capabilities of the U.S. private sector to facilitate the export of clean energy technologies abroad. It includes three categories of action: (1) establishing effective structures for collaboration; (2) assisting host governments in establishing the investment frameworks that will be more receptive to clean energy technologies; and (3) enhancing the competitiveness of U.S. technologies and services in international clean energy technology markets.

Responding to input from industry representatives, CETE will include three major categories of program elements: (1) timely assistance to industry in solving problems with current clean energy technology projects in developing countries; one of the mechanisms used will be a Project Assistance Team; (2) “fast track” mechanisms for facilitating and assisting industry with new projects where a federal government partnership is requested, such as in financial packaging; and (3) multi-agency CETE “signature initiatives” originated by the CETE agencies, in consultation with industry and other affected parties.

CETE will be implemented by the interagency Working Group at a high level of agency leadership, which will approve CETE program activities, approve the framework for assessing program performance, commit agency support of CETE, and submit an annual report to Congress. The Working Group will be assisted by an external Federal Advisory Committee (FAC), which will advise the Working Group regarding the appropriateness of the portfolio of activities for achieving program objectives, assist in assuring effective linkages with U.S. nongovernmental partners, annually evaluate the progress of the CETE program, and produce a publicly available annual report to the Working Group.

CETE Strategic Plan

I. Introduction

The Report of the FY 2001 U.S. Senate Appropriations Committee on the Energy and Water Development Bill directs the formation of an interagency Working Group, jointly chaired by the Departments of Energy (DOE) and Commerce (DOC) and the United States Agency for International Development (USAID). This interagency Working Group is responsible for improving the federal government's role in promoting the export of clean energy technologies. Other agencies represented on the Working Group include the Departments of State and Treasury, the Environmental Protection Agency (EPA), the Export-Import Bank (Ex-Im), the Overseas Private Investment Corporation (OPIC), and the Trade and Development Agency (TDA). The Senate Report requests the preparation of a five-year strategic plan for a clean energy technology exports (CETE) program and annual status reports.

As required by the Senate Report, the three co-chairs of the CETE interagency Working Group submitted the first annual report to Congress in April 2001. This annual report describes current efforts by the CETE Working Group agencies to facilitate clean energy technology exports, and indicates progress being made toward complying with the Senate Report's mandates.

Since the submission of the annual report, other official statements by the Office of the President and several bills proposed in the U.S. Congress have called for U.S. national initiatives to promote the export and use of clean, climate-friendly energy technologies, especially in developing countries and countries in transition. The President's *National Energy Policy* report, released in May 2001, recommended that the strategic plan being developed by the CETE Working Group be utilized as a road map for U.S. clean energy technology exports. Soon afterward, *The Climate Change Review – Initial Report*, announced on June 11, 2001, called for activities to deploy and adapt climate-friendly energy technologies for developing countries. This report also cited the strategic plan being developed by the CETE Working Group as the guide for exploring ways “to help countries in the Western Hemisphere and throughout the world build the technical and policy foundations for a cleaner energy future.”

The success of a U.S. commitment to exporting clean energy technologies, however, is not solely dependent on U.S. government spending. CETE must emphasize activities that leverage the resources of multilateral development banks and other international organizations, private industry, private sector financial institutions, other nongovernmental institutions, and foreign governments.

II. Definitions

For the purposes of this strategic plan, “clean energy technology” is defined as an energy supply or end-use technology that, compared with technologies already in commercial use in developing countries, countries in transition, and other partner countries for similar purposes, emits substantially lower levels of greenhouse gases and other pollutants over its lifecycle and may generate substantially smaller or less-toxic volumes of solid or liquid wastes. “Exports” are defined as U.S. goods and services which are marketed to foreign countries.

III. Mission

The mission of CETE is to increase U.S. clean energy technology exports.

Through a multi-agency, multi-party approach, CETE will combine the particular strengths of different government agencies to facilitate a more cohesive effort, in harmony with industry and other nongovernmental institutions, to transform energy technology markets in developing countries. This effort should increase the adoption of U.S. clean energy products and services by responding to existing demand, stimulating international markets, and encouraging providers and users of energy technologies to choose cleaner alternatives while enhancing the attractiveness of U.S. clean energy technologies in these markets.

IV. Vision

CETE envisions a world where the value of U.S. clean energy technology exports and clean energy technology use in developing countries is increasing substantially.

CETE hopes to achieve a future where well-functioning markets in developing countries attract an improved combination of clean energy technologies to meet energy needs by transforming economic and social needs into market demand. This optimal combination will differ among regions and countries of the world, depending on the mix of energy resources and end uses in each particular circumstance. The resulting combination of technologies will support each host country or region’s social and economic priorities while protecting the local and global environment. In this future, a rich portfolio of appropriate U.S. clean energy products and services, effectively transferred through U.S. industry-government partnerships, will be a major contributor to meeting local energy needs.

V. Challenges

The U.S. faces three major challenges in its global energy policy: market competition, environmental sustainability, and energy security. Although CETE was initially intended to address the global trade challenge, policy developments during calendar year 2001 transformed CETE into a broader initiative. White House references to CETE in connection with energy security issues (National Energy Policy, May 2001) and environmental sustainability issues (President's Initiative on Climate Change, June 2001) expanded the initiative to include environmental and energy security concerns. Although the mission of CETE is focused on exports, exports of clean energy technologies can also have a positive effect in several areas of global energy policy.

Market Competition

Globalization is increasing economic competition throughout the world, including the market for energy technologies. To enhance its own economic prosperity, the United States must increase its market share for energy technologies where that share is now low, and maintain market share and increase market size where the current U.S. share is high. The number of clean energy technology providers competing in emerging markets, such as China and India, is increasing dramatically. As the economies in these developing countries grow, such countries will also become competitors in the global market.

Currently, U.S. industries feel that it is challenging to export clean energy technologies because these industries are often competing against foreign companies that receive a higher level of export promotion support from their government. For instance, in 1998, Germany spent 17 cents per thousand U.S. dollars of GDP on export promotion and France spent 16 cents. By contrast, the United States spent only half of one cent. Many countries use their foreign aid resources to influence major projects by tying their aid to procurement of domestic technologies. U.S. aid policy does not currently support capital projects which, industry believes, puts them at a competitive disadvantage. U.S. firms are also at a disadvantage due to lack of dialogue between U.S. vendors and U.S. overseas developers and bankers. With respect to foreign competition, the vendor, developer, and banker may all be owned by the same conglomerate, thus enhancing their competitive edge.

U.S. industries also indicated that they are constrained in some cases by government regulation. Policies such as complex tax rules and trade sanctions against foreign countries often reduce the competitiveness of U.S. industries in foreign markets. Although trade sanctions are important U.S. foreign policy tools, competitors often fill the void in these markets, thereby expanding their market share at the expense of U.S. companies.

CETE can improve the United States' ability to respond to international competition, stimulated by market demand, by leveraging the resources of federal agencies effectively and efficiently and by raising policy issues that may hamper the export of U.S. technologies abroad. Because the United States is a leader in clean energy technology,

expanding the global markets for clean energy technology and encouraging open competition for these new markets will result in substantially greater gains for U.S. exports. By addressing these issues, CETE may help the U.S. improve its trade balance and enhance our economic well-being.

Environmental Sustainability

Developing countries as a whole will increasingly dominate the global picture of greenhouse gas emissions and pollution. For example, China and India are already the second and fifth largest emitters respectively of greenhouse gases in the world. The use of current energy technologies in developing countries causes severe pollution through emissions of nitrous oxides, sulfur oxides, carbon monoxide, particulate matter, and other toxic chemicals and metals. At a local level, these pollutants can pose a significant threat to the local environment and the general population. At a global scale, climate change resulting from the emission of greenhouse gases such as carbon dioxide (CO₂) could substantially alter and damage the long-term health and viability of the Earth's ecosystems. Although the National Academy of Sciences noted in the 2001 "Climate Change Science" report to the President that considerable uncertainty remains, climate change and global pollution levels must be addressed. By encouraging the adoption of clean energy technologies in developing countries, CETE can encourage environmentally sustainable growth in these markets, which can help address local pollution levels and reduce the emission of greenhouse gases.

Energy Security

U.S. energy security is linked to the future growth of world energy demand. The world energy market will be impacted significantly by the energy choices made by developing countries over the course of the next two decades. Developing countries and countries in transition will require a significant increase in energy capacity in order to continue their rapid economic growth. As developing economies grow, they will increase demand on the world oil supply, which directly influences the health of the U.S. economy.

CETE can play a role in reducing the developing world's future demand for oil by widening the availability of clean energy alternatives to developing countries and assisting in optimizing the use of indigenous resources. U.S. exports of clean energy technologies will also improve U.S. energy security by diversifying energy sources and reducing global consumption through efficient technologies. The adoption of clean energy technologies in the developing world will help maintain affordable energy prices for consumers in the United States.

VI. Current Needs and Resources

CETE represents a partnership that combines the resources of the U.S. federal government and the capabilities of the U.S. private sector to facilitate the export of clean energy technologies abroad.

What Industry Needs from Government

Consultations with private sector representatives over the past several months indicate that the U.S. private sector has identified areas where the U.S. Government can help accelerate clean energy technology. These areas include:

- Assistance to developing countries in implementing a policy, legal, and regulatory framework that will be more receptive to clean energy technologies and foreign investors
- Assistance in financial packaging so that developing countries find U.S. clean energy technologies as inexpensive as alternatives being offered by competing countries
- Access to government risk-sharing partnerships in promising but uncertain markets, including financial and technical assistance
- Assistance in removing barriers to the completion of specific field projects where U.S. government intervention may enable closure
- Participation in discussions with regard to the application of government funds in support of export promotion programs

In some cases, the relative importance of these different areas of support may differ between larger and smaller firms.

What Government Can Offer to Industry

Operating within current frameworks prior to the direction provided in the Senate Report, the nine CETE member agencies were already individually engaged in a number of activities that supported the export of clean energy technologies (e.g., the Department of Commerce's International Clean Energy Initiative). Many of these agencies' roles (Box 3) can be enhanced by the senior-level, multi-technology, multi-agency CETE Working Group once it is established. Through coordination of the agencies activities, U.S. government efforts can be expanded and made more effective. In summary, the CETE Working Group can enhance the following roles that are offered by the nine U.S. federal agencies involved in the CETE initiative:

- Assistance with preparing international markets in selected countries and regions to be more receptive of clean energy technologies: policy dialogue, capacity building, and information dissemination
- Assistance with financial risk-sharing under specific conditions
- Assistance with technology adaptation and adoption through partnerships with industry
- Assistance with strengthening U.S.-foreign partner relationships through trade missions and other activities to put industry representatives in direct contact with prospective customers in foreign markets

CETE is not only a partnership among federal government agencies and between agencies and the private sector; it is also a partnership between the CETE member agencies and the U.S. Congress. Both agency roles and industry activities are carried out within a framework of existing national legislation and policies. One function of CETE will be to identify possible legislative additions or changes that would facilitate clean energy technology exports, based on industry inputs.

**BOX 3. U.S. GOVERNMENT AGENCY ROLES AND ACTIVITIES RELATED
TO CLEAN ENERGY TECHNOLOGY EXPORTS
(Based on CETE Status Report to Congress, April 2001)**

Agency	Agency Role	International Initiatives/Activities
DOE (Co-chair)	Technology development and innovation; multilateral and bilateral agreements	Numerous activities throughout all regions of the world; agreements signed with 46 countries
USAID (Co-chair)	Advancing long-term and equitable economic growth in the developing world while furthering America's foreign policy interests in expanding democracy and free markets	Technical assistance, partnerships, and training to increase institutional capacity and to improve policy, legal, and regulatory frameworks; to improve the ability of public and private institutions to provide energy services; to increase public understanding of, and participation in decisions regarding energy service delivery; and to develop and catalyze innovative financing mechanisms
DOC (Co-chair)	Trade policy and development through the International Trade Administration	International Clean Energy Initiative (ICEI) to promote sales of U.S. products and services overseas; develop policy that will encourage foreign government officials to open markets and enforce trade laws
State	Implements U.S. foreign policy, including economic prosperity and environmental sustainability goals	Activities help open overseas markets, improve investment climate in foreign markets, enhance economic growth, and promote U.S. exports; promotes science and technology cooperation with foreign governments
Treasury	Formulates and executes U.S. international economic and financial policies	International Trade Data System (ITDS) helps facilitate trade information for U.S. businesses
Ex-Im	Helps finance the overseas sales of U.S. goods and services	Environmental Exports Program increases level of support for environmentally beneficial exports
EPA	Promotion of environmentally sound technologies and policies; technical assistance and training	Capacity building and market conditioning in select countries to help "level the playing field"; clean technology assessment
OPIC	Insures and finances overseas projects that include substantial U.S. participation, are financially sound, and promise significant benefits to the social and economic development of the host country	Programs support clean and efficient energy projects that rely primarily on natural gas and renewable hydroelectric and geothermal resources rather than coal and oil
TDA	Helps develop commercial opportunities in emerging markets	Numerous energy and power-related projects throughout the world

VII. Objectives

CETE's objectives are to:

- Strengthen the institutional mechanisms within the U.S. government for supporting the export of clean energy technologies
- Accelerate the use of clean energy technologies in those markets
- Substantially increase U.S. market shares in growing clean energy technology markets while minimizing cost and risk to Federal taxpayers

VIII. Strategies

CETE's overarching strategy is to establish an effective structure for collaboration within the U.S. government and between government and industry in order to achieve the above objectives within existing resources. CETE's strategies include three categories of action. The first focuses on effective multi-party collaboration. The other two reflect the fact that increasing clean energy technology exports requires both improving the readiness of international markets to receive and use such products and services and also improving our national capacity to take full advantage of growing export market opportunities where they exist.

Establishing Effective Structures for Collaboration

CETE will coordinate federal agency roles and activities related to clean energy technology export promotion, establish a Federal Advisory Committee (FAC) to assure private sector participation in the CETE program design and implementation, and advise Congress on any barriers to collaboration that might be addressed by legislation.

Conditioning International Markets to Be More Receptive to Clean Energy Technologies

It is difficult to accelerate the use of clean energy technologies in markets that discourage them. CETE will work to condition markets by facilitating policy dialogue with partner countries and multilateral development banks, building capacity in partner countries, by creating public-private partnerships, disseminating information, demonstrating technology, and conducting reverse trade missions to expand awareness of clean energy technology potentials. CETE will cooperate with developed nations to create conditions that will benefit the world.

Enhancing the Competitiveness of U.S. Technologies and Services in International Clean Energy Technology Markets

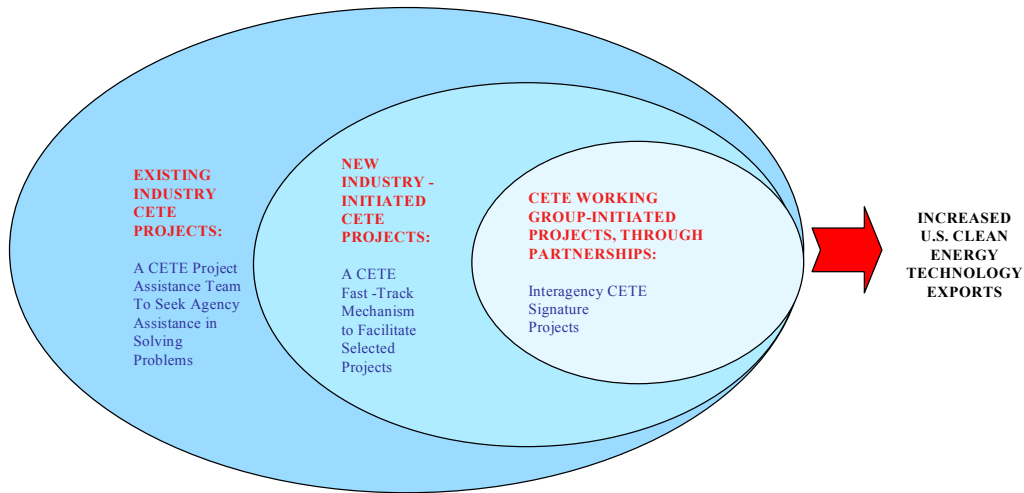
With assistance from industry in identifying trade barriers, CETE will disseminate information to the private sector about market opportunities and conditions, improve the coupling of clean energy technology projects with financial assistance and other risk-sharing programs, collaborate with industry in developing and adapting technologies to compete in developing country markets, and utilize trade missions and other tools to build long-term relationships between U.S. firms and institutions with local buyers and counterparts. In addition, CETE representatives will identify process improvements associated with resource allocation, interagency coordination and program implementation.

IX. Program Elements and Project Criteria

Responding to input from industry representatives, CETE will include three major categories of program elements (Figure 1):

- a. On-going industry CETE projects. The CETE initiative will offer timely assistance to industry in solving problems with current clean energy technology projects in developing countries. Among the possible mechanisms will be a one-stop CETE Project Assistance Team that, when contacted, will contact appropriate agencies and be advocates for quick agency action, with the assistance of the agency CETE representatives: policy intervention, financial assistance, technical assistance, and capacity strengthening, as appropriate. CETE will complement established interagency processes that provide advocacy, trade compliance, and investment dispute support to the business community.
- b. New industry-initiated CETE projects. For new projects being started by industry, where a federal government partnership is requested, the CETE Working Group will establish a mechanism to put selected projects on a “fast track” for facilitation and assistance. This mechanism will be designed to be efficient, relatively simple, and inexpensive to use, and it will be developed and implemented in consultation with industry.
- c. CETE “signature initiatives.” The CETE Working Group will also establish initiatives under the CETE Working Group umbrella that respond to industry’s longer-term, less project-specific, export needs. In developing its initiatives in consultation with industry and state agencies, the Working Group will pay special attention to activities that will improve “processes” within which industry works: e.g., market conditioning, capacity building, and technology adaptation and adoption.

FIGURE 1: CETE PROGRAM ELEMENTS



In the latter two cases, the principal criteria for project selection will be (1) the activity satisfies the CETE definition of clean energy technologies; (2) the activity involves collaboration among two or more federal agencies; (3) the activity is driven by strong industry interest and support; and (4) the activity has the potential for significant impact relative to the objectives of CETE.

X. Measuring Progress

The CETE program will include elements designed to track and periodically evaluate program progress, utilizing measures selected in consultation with industry. Once the CETE Working Group is established, specific performance measures will be delineated for projects. Each of these metrics will be measured per Federal dollar invested. Examples of quantitative measures that will be considered for CETE are:

- increase in global or national market share,
- percent increase in the dollar value of exports,
- number of U.S. jobs created,
- increase in the quantity or proportion of energy provided by clean energy technologies in other countries,
- level of foreign direct investment,
- quantity of emissions reduced, and
- private-sector participation in government-initiated projects.

XI. Implementation

CETE faces a formidable challenge in making effective interagency integration and effective public-private sector partnerships a reality. If it is to succeed, it must address issues of mechanisms and incentives for integration that go far beyond just establishing an interagency Working Group in support of the process and forming an external advisory committee, although these are critically important steps along the way.

Initially, CETE needs to establish its Working Group at a high level of leadership, preferably at the Deputy or Under Secretary level (or equivalent). This group will approve CETE program activities, approve the framework for assessing program performance, commit agency roles in support of CETE, and submit an annual report to Congress.

Once the CETE Working Group has been established, specific CETE projects will be selected by the Working Group for implementation. The Working Group will outline the most effective manner for carrying out the designated activities and establish a detailed timeline for the achievement of project goals and for project completion. Illustrative examples of possible CETE projects and time horizons are outlined in Appendix D.

In addition to this interagency Working Group, an external CETE advisory committee will be formed under the provisions of the Federal Advisory Committee Act (FACA), drawing participants from the private sector, state agencies, and other interest groups. The advisory committee is expected to be in place in calendar year 2002. The advisory committee will advise the Working Group regarding the appropriateness of the portfolio of activities for achieving program objectives, assist in assuring effective linkages with U.S. nongovernmental partners, annually evaluate the progress of the CETE program, and produce a publicly available annual report to the Working Group.

CETE will take advantage of current resources, technical expertise, and decision-making authority of its federal agency members. Complementary rather than competitive roles will be emphasized. For instance, among the three lead agencies, the Department of Commerce will assist with market characterization and financial packaging. The U.S. Agency for International Development will assist with market conditioning and energy policy development. The Department of Energy will assist with technology adaptation and demonstration and with energy policy dialogues (Box 4). In consultation with the advisory committee, the CETE interagency Working Group will develop and use a structure for day-to-day program operation that assures coordination, offers incentives for collaboration, and is adaptive so that it can be fine-tuned through CETE experience.

As indicated earlier, the Senate Report asks the CETE interagency Working Group to submit an annual status report to Congress describing technology, policy, and market opportunities for international development, demonstration, and deployment of clean energy technology. The Senate Report also asks that the CETE annual report to include any policy recommendations to improve the expansion of clean energy markets and U.S. clean energy technology exports.

BOX 4. AGENCY ROLES IN RESPONDING TO CLEAN ENERGY EXPORT CHALLENGES (ILLUSTRATIVE)

Export Challenge	Government Program	Responsible Agencies
Product development & innovation	R&D for technology innovation and product development	DOE
Technological sophistication of trading partners	Technology cooperation between U.S. labs and universities and trading partners' labs and universities	DOE with some support from USAID
Economic & political viability of trading partners, including the ability of legal, regulatory, and governance structures, and of business and finance sectors, to support trade	Development assistance	USAID with support from DOE, Commerce, State, and other CETE members.
Marketing and market share	Trade promotion	Commerce, State and DOE, with some support from USAID
Project identification and development	Deal/project specific assistance (contacts, feasibility studies, finance mechanisms, etc.)	Commerce, DOE, State, USAID, TDA, OPIC, Ex-Im
Conformance of trading partners' trade rules with U.S. and WTO requirements	Trade diplomacy and compliance	U.S. Trade Representative and Commerce with support from DOE, State, and USAID
Promoting domestic products and services	Deal/project specific assistance of U.S. vendors	Senior levels of Commerce, DOE, and State

The CETE Working Group plans to use these annual reports as an additional opportunity to update its strategic plan. These updates will include the addition of any new information that will help the CETE Working Group to better coordinate its efforts to promote U.S. exports of clean energy technology. Additionally, these updates will incorporate information that results from any new technology, market, or policy changes that occur.

Appendix A: Industry Meetings

Senate Report 106-395 directs the interagency Working Group to consult with the private sector on the export and development of clean energy technologies and on the development of the 5-year strategic plan, through an advisory panel. Pending the formation of the advisory panel, the Working Group held two meetings with industry, non-governmental organizations, and trade group representatives, one in July 2001 and a second in January 2002 in order to solicit input for this strategic plan. The participants and agenda for each of these meetings are summarized below.

July 2001 Meeting

Date: July 18, 2001

Location: Washington, DC

Sponsorship: United States Energy Association

Participants:

- Industry: MBIA Clean Fuels Corporation, Wisconsin Energy, Westinghouse Electric Company, Delphos International, Design Fuels, Resource Mobilization Advisors, EOP Group, Ford Motor Company, Global Solar Energy, Inc., Bechtel Power Corporation, General Electric, Siemens Westinghouse Power Corporation, K&M Engineering and Consulting Group, Plug Power, Inc., Texaco, Inc., Black & Veatch, CLI Corporation, and various professional services and consulting companies
- Government: DOE, DOC, EPA, Ex-Im, USAID, Argonne National Laboratory, Brookhaven National Laboratory, Oak Ridge National Laboratory, Los Alamos National Laboratory, National Energy Technology Laboratory
- Trade and Non-Profit Organizations: USEA, Export Council for Energy Efficiency, Solar Energy Industries Association, Nuclear Energy Institute, National Mining Association, World Environment Center, Winrock International, U.S. Hydropower Council, National Association of Manufacturers, Joint Institute for Energy and Environment, Energy Services Coalition, Integrity Research Institute
- States: Oklahoma, Public Utilities Commission of Ohio

Discussion Topics:

- Origin of the CETE Initiative
- The April 25, 2001 Annual report to Congress. “Status Report to Congress on Current and Proposed Activities Under the Clean Energy Technology Exports Initiative”
- Overview of the proposed CETE five-year strategic plan
- Open discussion of various topics
- Additional steps

January 2002 Meeting

Date: January 15, 2002

Sponsorship: United States Agency for International Development

Location: Washington, DC

Participants:

- Industry Trade Representatives: AFL-CIO, Alliance to Save Energy, American Society of Heating, Refrigeration, and Air-Conditioning Engineers, American Wind Energy Association, Coal Utilization Research Council, Export Council for Energy Efficiency, Geothermal Energy Association, Geothermal Heat Pump Consortium, Institute of Electrical and Electronics Engineers, Interstate Natural Gas Association of America, National Mining Association, Natural Gas Supply Association, Nuclear Energy Institute, Service Employees International Union, Solar Energy Industries Association, Solar Energy Research and Education Foundation, United States Council for International Business, United States Energy Association, United States Hydropower Council for International Development, Winrock International
- Government: DOE, DOC, USAID, Ex-Im, TDA, OPIC, Representatives from the Offices of Senator Robert C. Byrd and Senator Max Baucus

Discussion Topics:

- Background, meeting objectives, and industry input process
- Mission of the Clean Energy Technology Exports (CETE) Initiative
- Approach to accomplish the mission
- How to measure success
- Criteria to select CETE activities and projects
- Overview of current federal clean energy technology export promotion activities
- Specific actions to be taken by the federal government
- Closing statements and next steps

Appendix B: A Market-Pull/Supply-Push Perspective

There is broad agreement that the CETE challenge calls for the establishment of a comprehensive national program to deal with both the market-pull and supply-push aspects of increasing U.S. clean energy technology exports. There is also widespread agreement that, although this strategic plan considers a five-year time horizon, it is aimed at a ten to twenty-year time horizon, because achieving the goals of CETE requires a sustained effort over a long term. Not only will many of the impacts of activities over the next five years emerge fully in later years, but many of the activities -- from market transformation to technology improvement -- are specifically designed to pay off over the next two decades. For example, promoting more widespread use of clean energy technologies involves two kinds of technology-oriented initiatives. One type of initiative seeks to push technology applications closer to the current technology frontier: closer to what is optimal based on current commercially-proven technology. A second type of initiative seeks to push the technology frontier outward: to improve the characteristics of clean energy technologies to be offered for commercial application in the future. A balanced Clean Energy Technology Export program must include both.

One important aspect of CETE is to focus on (a) improving the market acceptance of clean energy technologies in target countries and regions by increasing local understanding of the merits of CETE use and encouraging and assisting energy sector policy reform, building in part on continuing US government efforts to promote policies favorable to foreign direct investment, and (b) combining such an enhanced “market pull” for clean energy technologies with an enhanced “supply push,” enhancing the market competitiveness of U.S. clean energy technology products and services in developing country contexts. In both cases, clean energy technologies include both supply-side and demand-side alternatives.

Market pull initiatives emphasize:

- Policy/regulatory initiatives to promote a decision-making climate favorable to clean energy trade and clean energy technology use, including working with key stakeholders to highlight the benefits of clean energy technologies in terms of their development and environmental objectives
- Information initiatives to promote local empowerment in making CETE decisions, including supporting trade development programs, partnerships, and the provision of tools and methods for partners to conduct their own evaluations of alternatives and their implications
- Institutional capacity building initiatives to strengthen local institutional capabilities to analyze, implement, and support CETE options, including local technical capabilities

Supply push initiatives emphasize:

- Financial initiatives to provide innovative public-private sector collaborations in risk-sharing and other financing approaches, as consistent with U.S. trade policy, to enable U.S. providers of products and services to compete on a level playing field with counterparts from other countries, leveraging limited U.S. financial resources to make much larger resources available to support U.S. projects
- Improved information about developing country market conditions and realities to inform technology adaptation (e.g., to down-size for smaller applications, to increase robustness, and/or to reduce costs)
- Technology initiatives such as collaborative R&D and pilot or demonstration projects designed to promote local understanding and adaptability of technology options, to enhance local technical capabilities, and as appropriate to establish the applicability of U.S. clean energy technology technologies under local conditions
- Better institutional linkages between U.S. clean energy technology parties and counterparts in key developing country markets

Appendix C: Dimensions of CETE

When discussing clean energy technology use in developing countries and countries in transition, there are many dimensions that need to be considered. For instance, each U.S. government agency performs a particular role or function, and thus has different needs and requirements. This is also true for each country or particular region of the world. The needs and requirements in Latin America will be different than China or Africa. The box below highlights the dimensions that were considered during development of the strategic plan.

The dimensions of the CETE challenge

- Regional and national differences: e.g., Asia, Latin America, EE/FSU, Africa
- Clean energy technology markets: e.g., clean coal, nuclear, renewable energy sources, efficiency improvement, cross-cutting categories such as materials and controls -- including construction, technologies, and components
- Different time horizons: e.g., different elements of a strategic plan aimed at near, mid, and long terms
- Different components of market transformation: e.g., developing and adapting technologies, opening doors, closing the deal
- Different mechanisms: e.g., policy dialogue, financial packaging, and technology demonstrations
- Different roles of different contributors:
 - The different but complementary roles of government, the private sector, and non-governmental organizations -- including different needs and perspectives within U.S. industry, e.g., between large and smaller firms
 - The complementary roles of different U.S. government agencies, each with a vital role to play
 - Complementary roles of different financial and development institutions, especially multilateral development banks and international private investment institutions, which may be leveraged by U.S. government assistance with technology demonstrations and project design and, in the case of the multilateral development banks, may be influenced by U.S. policy advocacy as an important member

Appendix D: Illustrative CETE Activities

The focus of this appendix is to illustrate the potential scope of CETE by indicating possible activities of the CETE Working Group. The activities outlined below are organized in relation to the three CETE strategies: establishing effective structures for collaboration, conditioning international markets to be more receptive to clean energy technologies, and enhancing the competitiveness of U.S. technologies and services in international clean energy technology markets. In most cases, activities include initial steps, efforts aimed at nearer-term payoffs, and efforts concerned more with the longer term.

A. **Strategy 1:** Establishing Effective Structures for Collaboration

Initial steps could include some or many of the following activities:

- In collaboration with the CETE Advisory Panel, a review of U.S. experience with clean energy technology exports to identify lessons learned and priorities for foundation-building
- Targeted workshops in a limited number of key countries and/or regions to explore CETE directions, priorities, and challenges, involving nongovernmental partners and, as appropriate, representatives of multilateral development agencies: candidates include China, India, Mexico, and Russia
- Development of CETE Joint Action Plans with selected countries and/or regions, building from current agreements and from experience with such previous efforts as the Country Studies Program and the Technology Cooperation Agreement Pilot Project (TCAPP)
- Investigation of potential linkages between CETE and such multilateral initiatives as the IEA Committee on Energy Research and Technology (CERT), the Asia Pacific Economic Cooperation (APEC) forum, the Free Trade Area of Americas (FTAA) initiative, WTO Energy Services Negotiations, the International Atomic Energy Agency, the Nuclear Energy Agency, and other OECD programs

Illustrative Actions for the CETE Strategy Concerning Effective Structure for Collaboration

- Development of CETE Joint Action Plans with selected countries, building on current agreements
- Encouragement of regional energy cooperation in the Western Hemisphere
- Collaboration with Multilateral Development Banks and other international partners to assure that energy-sector assistance strategies are emphasizing clean energy technologies

- Active discussions with multilateral development banks (MDBs) and other lenders and international partners to assure that energy-sector assistance strategies are emphasizing clean energy technologies
- Review of statutory, policy-based or informal barriers to the use of nuclear energy as a clean technology, which includes the application of nuclear technology in programs administered by USAID, Department of Commerce, Export-Import Bank, Overseas Private Investment Corporation, and the Trade and Development Agency
- Linking CETE with other aspects of the President’s climate change initiative concerned with improving indigenous capacities for emission monitoring and mitigation and with improving capacities for regional climate change forecasting and impact assessment
- A review of potentials for cross-boundary and shared resources for energy development, along with potential benefit-sharing and potentials for conflict (e.g., the South Asia Regional Initiative for energy)

For *nearer term* payoffs, activities could focus on:

- Strategic planning and international collaboration to address national and regional energy security issues, such as the U.S.-Japan energy policy dialogue (which is increasingly concerned with energy security in Asia)
- Encouragement of regional energy cooperation to resolve major issues and concerns, e.g., in the Western Hemisphere
- Collaboration with MDBs and other international partners to assure that assistance strategies are consistent and mutually reinforcing with regard to energy security issues

B. Strategy 2: Conditioning International Markets to Be More Receptive to Clean Energy Technologies

Initial steps related to this objective could include:

Illustrative Actions for the CETE Strategy Concerning Market Conditioning

- Develop action plans for natural gas infrastructure improvement in selected countries and regions
- Demonstrate a model distributed electricity system, integrating a variety of supply sources and efficiencies, in a selected country
- Assist three key partners in developing government practices that emphasize purchases of clean energy technologies and increasing efficiency in government operations
- Demonstrate models of residential and commercial building efficiency in three key countries, utilizing U.S. equipment and expertise
- Collaborations between U.S. R&D institutions and counterparts to enhance local technical capacity

- Reviewing available information about energy needs for development in key developing countries and countries in transition, emphasizing energy services needed for economic development and improvements in the quality of life, with special attention to (a) growing urban concentrations and (b) rural areas not presently served by modern energy infrastructures
- Reviewing infrastructure needs to provide adequate, reliable, and affordable energy services in key countries for the long term
- Improving information systems and data bases for estimating potentials for emission reductions in key countries and regions, in collaboration with local counterparts, and in systems for monitoring trends in emissions

For the *nearer term*, this objective could be focused on:

- Improving policy foundations for clean energy choice and use in key countries and regions, including attention to energy pricing, energy sector restructuring, emission standards and other environmental requirements, and import and international partnership policies
- Improving technical foundations for clean energy choice and use in key countries and regions, including attention to endogenous capacities for clean energy technology adaptation and testing, infrastructures for clean energy technology maintenance and problem-solving, demonstration projects involving local counterparts (see later objectives), study missions and seminars, and associated technical assistance
- Improving human resources and institutional capacities for clean energy choice and use in key countries and regions, including attention to strengthening local centers of expertise, improving tools and information systems for integrated analyses of energy choices, and professional exchanges
- Cooperating with potential customer countries to develop innovative approaches to resolving financing, pricing, and revenue collection issues that might inhibit a decision to deploy new plants that use clean energy technology
- Increasing the emphasis on clean energy technologies in bilateral commercial, environmental, and energy consultations
- Promoting and supporting policies that encourage and enable distributed electric and thermal energy production from local renewable energy resources, including independent power production agreements with electric utilities
- Promoting and supporting clean fossil-fueled power plant construction and rehabilitation

- Developing initiatives to diversify sources of oil and gas as clean energy alternatives, e.g.: policy dialogue to improve the investment climate in FSU, natural gas infrastructure development, oil spill response readiness, best practices in exploration and production
- Pursuing opportunities to switch from oil use in industry and electricity generation to clean coal technology use and natural gas
- Pursuing opportunities to improve transportation and industrial sector efficiency
- Promoting increased natural gas use for power generation and industrial facilities, including infrastructure development
- Supporting field application of innovative technologies for nuclear plant design, fabrication, construction, operation and maintenance. Industry anticipates using these methods in new domestic nuclear plants, which will result in lower capital costs, shorter construction schedules, and more certainty for the financial world providing an opportunity for further collaboration
- Encompassing system-wide efficiency improvements, including electricity system efficiency improvements, electricity end-use efficiency standards, transportation sector efficiency improvements and emission reduction policies and practices, industrial emission reduction through clean energy technology use, and buildings energy efficiency improvements emphasizing new commercial, governmental, and residential building complexes
- Encouraging clean energy use by governments, including efficiency improvements in government buildings and transportation fleets, government purchase policies promoting efficient supply streams, and effective collaborations with industry to encourage efficiency improvements
- Developing financial mechanisms to accelerate clean energy technology use (including clean energy technology cost buy-downs and leveraging, including relationships with existing and emerging FCCC flexibility mechanisms as appropriate and as consistent with U.S. policy), identification of candidate clean technology deals, policy dialogue, and steps toward deal-making
- Assisting developing countries in the establishment of a nuclear safeguards program
- Assisting developing countries in establishing the infrastructure necessary to deploy new nuclear plants as part of “capacity building” plans in targeted economies.
- Supporting studies for emission-free production of hydrogen for fuel cells

- As appropriate in responding to global and national security priorities, targeting efforts to improve energy security in flash-point areas of concern to U.S. national security. Candidate areas might include Afghanistan, the Middle East and the countries of the former Yugoslavia

For the *longer term*, activities would emphasize technology adaptation and demonstration, policy dialogue, technical assistance, and leveraging other sources of project financing, with a particular concern for improving energy services in growing urban areas in key countries. More specifically, in consultation with U.S. nongovernmental parties and the international development assistance community, CETE could explore the feasibility of developing an energy sector equivalent of the Marshall Plan for key developing countries: analyzing costs, benefits, pathways, and potentials for international cost-sharing. Illustrations of other types of activities include:

- Promoting activities to emphasize cooperative R&D, capacity building and technical assistance
- Taking steps toward a transition to regionally appropriate renewable and hybrid energy systems for electricity supply, industrial production, and transportation
- Identifying potentials for fuel cells in distributed energy generation systems
- Exploring potentials for nontraditional alternative sources of oil and/or oil substitutes, such as methane clathrate hydrates
- Exploring potentials for alternative energy sources for transportation end uses, such as fuel cells and hybrid systems for highway vehicles
- Exploring appropriate mass transit system design and development
- Promoting international standardization on NRC regulatory requirements – so that a nuclear power plant design licensed in the U.S. can be easily licensed in another country.
- Linking CETE to results of R&D to make carbon sequestration economically competitive

C. **Strategy 3:** Enhancing the Competitiveness of U.S. Technologies and Services in International Clean Energy Technology Markets

Initial steps in this direction could include:

- Identifying market opportunities and drivers, with the assistance of in-country U.S. government offices, focusing especially on bundling financial and technology packages to enhance competitiveness
- Assisting in developing innovative approaches to resolving financing and liability issues that may inhibit positive decisions to deploy nuclear plants

Illustrative Actions for the CETE Strategy on Enhancing Competitiveness

- In consultation with U.S. industry and U.S. trade associations, identify six high priority large CETE proposed exports and conclude three of them within two years
- Based on competitive proposals, provide cost buy-down assistance to selected innovative clean energy technologies that, once introduced into growing markets, are likely to represent sizeable exports
- In three key countries, aggressively expand marketing of industrial scale biomass energy
- Assess the modular pebble-bed nuclear reactor, evaluating safety requirements and developing standards as appropriate

For the *nearer term*, this objective of CETE could focus on:

- Promoting available technologies by expediting transactions and by targeted problem-solving to resolve obstacles in countries and regions with particular promise for increasing U.S. clean energy technology sales in the next five years
- Opening doors through careful development of successful demonstration projects with strong commercial potential, focused on market segments showing rapid growth and needing further U.S. public-private sector collaboration
- Focusing on a short list of possible projects to pursue, selected in consultation with U.S. industry and Ex-Im, TDA, and OPIC; strategies might include financial packaging, risk-sharing, and policy dialogue. Other activities would consist of demonstration projects, study missions and seminars, transfers of recognized expertise (e.g., U.S. hydroelectric expertise to Central Asia), and mechanisms for information exchange and networking, such as trade missions and workshops
- Transferring of U.S. expertise and experience to key partner countries through business to business, utility to utility, etc. interactions, including promotion of environmental best practices in exploration and production

For the *longer term* CETE envisions that, over the next several decades, clean energy technology choice and use will shift from current commercial technologies to emerging technologies that are cleaner, more efficient, and lower-cost. CETE could complement programmatic RD&D on clean energy technologies to keep the technology pipeline filled. In many cases, technology innovation will be a key to market penetration. Activities could focus on:

- Promoting policies and actions to accelerate clean energy technology use in developing countries and countries in transition by providing U.S. clean energy technology options that are attractive under local market conditions. This would include attention to market segments showing rapid growth potential but needing U.S. public-private sector collaboration to improve technologies and open doors for major market growth, ranging from renewable energy alternatives to nuclear energy, cleaner highway vehicles, industrial pollution prevention, and building envelope efficiency improvement.
- Identifying a few market segments likely to be very large and important in the long run but in which (a) U.S. shares are small because our technologies, often developed for our domestic market conditions, are not competitive or (b) current markets are small but are likely to grow rapidly under anticipated changes in market conditions.
- Promoting RD&D to develop and/or adapt U.S. clean energy technologies to better meet partner country needs and to be competitive under anticipated market conditions
- Emphasizing cooperative RD&D -- government/nongovernment and U.S./partner country -- to continue improving the portfolio of appropriate clean energy technologies available to meet developing country needs (also see Objective 2).
- Promoting RD&D on clean, high-efficiency electric power systems
- Conducting nuclear technology assessments of promising alternatives for international application, such as the modular pebble-bed reactor, with special attention to safety requirements
- Continuing support of the Generation IV Nuclear Energy Systems Initiative, that will identify and develop advanced nuclear designs offering advantages in the areas of economics, safety, proliferation-resistance, waste-minimization and sustainability

Appendix E: USAID Report: “Establishment and Operations of the Clean Energy Technology Exports Working Group – Findings and Recommendations”

To inform the preparation for the CETEWG, USAID’s Office of Energy, Environment and Technology, contracted with PA Consulting in the Summer of 2001 to produce a lessons-learned report. To accomplish this task, interviews were conducted by PA Consulting with people associated with past interagency trade promotion groups. On August 2, 2001, USAID presented the report titled “Establishment and Operations of the Clean Energy Technology Exports Working Group – Findings and Recommendations” to the working-level CETE team. Highlights of this report include recommendations in the following areas:

Mission	<p>Clear and Focused Mission. The CETEWG, with industry and congressional participation, should develop a clear and focused mission statement.</p> <p>Strategy and Participation. The strategy and activities of CETEWG should be sharply focused and driven by meaningful private sector involvement.</p> <p>Measure Success. The indicators to measure success must be derived from the mission statement, defined at the outset and periodically reported.</p>
Leadership	<p>Congressional Support and Legislative Authority. CETEWG should secure additional legislative authority that includes the requirement to obtain industry input and cultivate strong congressional support.</p> <p>Sustained Commitment and Clear Responsibilities. Representatives of the three co-chair agencies should be top level managers who are able to sustain their commitment to CETEWG’s success. These representatives should produce a charter, which spells out each of their responsibilities in achieving CETEWG’s mission.</p>
Operations	<p>Field-Driven Activities. CETEWG should organize itself and conduct its affairs to provide for headquarters coordination of field driven activities, focused on the needs of U.S. exporting companies and on host country opportunities.</p> <p>Focus Integrated Actions on Mission. CETEWG should ensure that all headquarters and field activities are focused on the mission and are designed to result in a successful export deal or in a measurable improvement in market operations in the host country.</p> <p>Decision-Making Structure. CETEWG should organize itself as a decision making body similar to a Board of Directors with members at the highest level, with an Executive Committee of mid- and high-level staff at the headquarters and field levels and sub-committees appropriate to fulfill its mission.</p> <p>Periodic Meetings. Senior-level CETEWG meetings should be held periodically with involved agencies and chaired by the most senior sponsor, such as a representative from the White House or a Secretarial Officer.</p>

Existing Organizations. CETEWG should consider including existing interagency organizations with similar but more limited missions, such as COEECT and TCAPP, taking care not to interfere with activities performed within the participating agencies and other related interagency groups such as TPCC and those administered by the USTR.

Focus. All activities should be focused on the mission and should be packaged to solve specific problems or remove specific barriers.

Appendix F: Acronyms

CETE – Clean Energy Technology Exports
CO₂ – Carbon Dioxide
DOC – Department of Commerce
DOE – Department of Energy
EET – USAID Office of Energy, Environment, and Technology
EIA – Energy Information Administration
EPA – Environmental Protection Agency
Ex-Im – Export-Import Bank
FAC – Federal Advisory Committee
FACA – Federal Advisory Committee Act
FY – Fiscal year
GDP – Gross Domestic Product
ICEI – International Clean Energy Initiative
OPIC – Overseas Private Investment Corporation
R&D – Research and Development
TDA – United States Trade and Development Agency
USAID – United States Agency for International Development
WTO – World Trade Organization

Appendix G: Reference Documents

1. National Energy Policy. National Energy Policy Development Group. May 2001.
2. The Climate Change Review – Initial Report. Office of the President. June 2001.
3. Status Report to Congress: Current and Proposed Activities Under the Clean Energy Technology Exports (CETE) Initiative. CETE Working Group. April 2001.
4. Toward an International Energy Trade and Development Strategy. United States Energy Association. October 2001.
5. The Establishment and Operations of the Clean Energy Technology Export Working Group: Findings and Recommendations. United States Agency for International Development. August 2001.
6. 1991/1992 National Energy Strategy Technical Annex 5: Analysis of Options to Increase Exports of U.S. Energy Technology. U.S. Department of Energy. 1992.