

Eco-Industrial Park

Workshop Proceedings

October 17-18, 1996
Cape Charles, Virginia

Co-Sponsored by
Northhampton County and the Town of Cape Charles, VA

February 1997

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Forward

The President's Council on Sustainable Development was established by President Clinton on June 29, 1993. Its purpose was to develop and recommend to the President a national sustainable development action strategy that will foster economic vitality and raise public awareness of sustainable development issues and participation in opportunities for sustainable development.

The Council adopted the definition of sustainable development as stated in the original Brundtland Commission report: development that meets the needs of the present without compromising the ability of future generations to meet their own needs. The Council is a groundbreaking partnership drawing leaders from industry, government, and environmental, labor and civil rights organizations, and is charged with developing bold, new approaches to integrate economic, environmental and social policies.

The Council transmitted its report to the President on March 7, 1996. The report is entitled *Sustainable America: A New Consensus* and has been hailed by leaders from the business, environmental, labor, civil rights, and government communities, as the first time in which consensus has been reached on critical economic, environmental, and social equity issues. At President Clinton's press conference in March at which he accepted the Council's report, he stated "...When I first appointed the Council almost three years ago, some of them knew each other only as adversaries. But with this report, they have shown us the power of partnership. They have demonstrated that when business, environmentalists, and government work together in good faith we can pursue simultaneously the goals of economic prosperity, social equity, and environmental quality."

At the heart of the Council's recommendations is the conviction that economic, environmental, and social equity issues are inextricably linked and must be considered together, and, that to achieve sustainability, institutions and individuals must adopt this new way of thinking. Eco-Industrial development is part of this new thinking.

The Council has now completed its first eight months of implementation, and will be continuing its work during the Clinton Administration's second term. For more information about the Council, its upcoming work, or to let us know about interesting work going on in your community, please contact the PCSD at (202) 408-5296. PCSD documents may be ordered toll-free at (800) 363-3732. The PCSD homepage, now being updated, may be found at www.whitehouse.gov/PCSD.

Acknowledgments

Many people were responsible for the success of this Eco-Industrial Park workshop. Special thanks go to Donald Clarke and Tom Harris from the Town of Cape Charles, and Timothy Hayes from Northhampton County for their co-sponsorship of the workshop. Thank you for inviting us to visit the beautiful Delmarva peninsula and for your splendid hospitality. Special appreciation also goes to the Eco-Industrial Park working group of the President's Council on Sustainable Development for its diligent efforts in planning the meeting. In particular, the Council is grateful for the leadership provided by Council member Dianne Dillon-Ridgley and Council liaison John Bullard, as well as the all-purpose support provided by Christine Eustis. Ed Cohen-Rosenthal

and Susanne Giannini-Spohn also deserve special recognition for their contributions before, during and after the workshop. Appreciation also goes to the remaining members of the planning committee for their guidance and insights: Ramon Alvarez, Scott Bernstein, Timothy Hayes, Jerry Kotas, Rick Luna, Amy Manheim, Jerry McNeil, Natalie Mills, and Harriett Tregoning. Other contributors include Bruce Fabens, Laurice Jones and Tad McGalliard.

The workshop involved many presentations and break out sessions. The Council wishes to thank all of the community presenters. We learned a great deal about Eco-Industrial Parks and your communities, and commend you for leading the way to a new paradigm for economic and community development.

Unlike most workshops that take place in hotels and conference centers, this workshop was truly hosted by the community. Great appreciation goes out to Barbara Schwenk for all her help with logistics, to Trinity United Methodist Church and the Kiptopeke Elementary school for allowing us to use your facilities, to the Northampton High School Chorus and Ms. Jo Ann Spady for providing entertainment and inspiration at the EIP Expo, and to Virginia's Center for Innovative Technology for its financial support of the EIP Expo.

Martin A. Spitzer, J.D., Ph.D.
Executive Director,
President's Council on Sustainable Development

I. Workshop Agenda

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| October 17: 11:30 a.m. Noon-1:00 p.m. | Arrival and Registration Lunch (Hosted by Cape Charles) |
| 1:00 p.m. | Welcome/Agenda Review/Introductions/Expectations (Marty Spitzer, PCSD) |
| 1:20 p.m. | Introduction to Cape Charles (EIP) (Tim Hayes, Director of Sustainable Development, National Oceanic and Atmospheric Administration) |
| 1.45 p.m. | Moderator: John K. Bullard, Director of the Office of Sustainable Development, National Oceanic and Atmospheric Administration Presentations by EIP Sites (10 minutes each) Baltimore, MD (Michael Palumbo, Fairfield EIP Site Manager and Larisa Salamacha, Senior Development Officer, Baltimore Development Corporation) Brownsville, TX (David A. Cobb and Michel A. Thomet, Bechtel Corporation) Burlington, VT (Mayor Peter Clavelle, Bruce Seifer, Assistant Director, Community and Economic Development Office and Judith Bell, Consultant, Burlington Electric Department) Burnside EIP, Nova Scotia (Wayne Barchard, Environment Canada) Civano EIP, Tucson, AZ (Tres English, Tucson Environmental Council) East Shore EIP, San Francisco Bay (Ernest Lowe, Indigo Development) Volunteer Site, Chattanooga, TN (David Daugherty, ICI Americas Inc.) |
| 3:00-3:15 p.m. | <i>Break</i> |
| 3:15 p.m. | Presentations by EIP Sites (10 minutes each) The Green Institute, Minneapolis, MN (Michael Krause, Interim Executive Director and Sabrina Lau) Plattsburgh, NY (Bruce Steadman and Mark L. Barie, Plattsburgh Airbase Redevelopment Corporation) Raymond, WA (Rebecca Chaffee, City Engineer, Jim Neva, Port of Willapa Harbor, Jim Lowery, Pacific County Economic Development Council and Lorraine Wrona, City of Raymond) Skagit County, WA (Kevin Morse and Don Wick, Economic Development Association of Skagit County) Shady Side, MD (Joe Abe, Business Ecology Network) Stonyfield Farm, Londonderry, NH (Peter Lowitt and Nancy Hirshberg, Stonyfield Farm, Inc.) Trenton, NJ (Jill Hallie Edwards, Division of Economic Development, City of Trenton) |
| 4:30-4:45 p.m. | Break |

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| 4:45-6:30 p.m. | Ground breaking Ceremony for Port of Cape Charles Sustainable Technologies Industrial Park |
| 6:30-8:00 p.m. | Reception and Dinner |
| 8:00-10:00 p.m. | Public Session, EIP Expo Keynote Speaker, Mayor Peter Clavelle, City of Burlington, VT |
| 10:00 p.m. | Adjourn |
| October 18: 8:00-8:15 a.m. | Problems and Solutions Introduction to the Day's Topics (John K. Bullard, Director of the Office of Sustainable Development, National Oceanic and Atmospheric Administration) |
| 8:15-9:15 a.m. | Plenary Presentations on 6 Topic Areas (6 speakers will each have ten minutes to outline the issues and set the tone for the entire group before dividing into 6 break-out sessions.) Track 1: Crafting Industrial Ecosystems Ernest Lowe, Indigo Development Track 2: Recruiting New Firms and Retaining Existing Companies Ed Cohen-Rosenthal, Work & Environment Initiative, Cornell University Track 3: Governance and Management Structures Peter C. Lowitt, Stonyfield Farm, Inc. Track 4: Strategies for Successful Community Involvement Michael Krause, Interim Executive Director, The Green Institute Track 5: Finance Chester Straub, Deputy Assistant Secretary for Program Operations, Economic Development Administration, U.S. Department of Commerce Track 6: Setting and Maintaining Performance Standards: The Project XL Example Maryann Froehlich, Director, Office of Policy Development, U.S. Environmental Protection Agency |
| 9:15-9:30 a.m. | Break (Divide into Break Out Groups) |
| 9:30-11 a.m. | 6 Break Out Sessions On Topic Areas Track 1: Forming an Industrial Ecosystem Moderator: David A. Cobb, Bechtel Corporation 10-minute presentation by Richard D. Pirrotta, Concurrent Technologies 10-minute presentation by David A. Cobb and Michel A. Thomet, Bechtel Corp. Track 2: Recruiting New Firms and Retaining Existing Firms Moderator: Larisa Salamacha, Baltimore Development Corporation Track 3: Governance and Management Structures |

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| | <p>Moderator: Jill Hallie Edwards, Division of Economic Development, City of Trenton, NJ</p> <p>Track 4: Strategies for Successful Community Involvement Moderator: Tim Hayes, Director of Sustainable Development, Northampton County, VA</p> <p>Track 5: Finance Moderator: Jeff Telego, Environmental Bankers Association</p> <p>Track 6: Setting and Maintaining Performance Standards Moderator: Jerry Kotas, U.S. Department of Energy</p> |
| 11:00-11:15 a.m. | Break (Divide into Assigned Break Out Groups) |
| 11:15-12:30 p.m. | 6 Assigned Break Out Session to Discuss Critical Questions and Next Steps |
| 12:30-1:15 p.m. | Reconvene to Summarize Discussion |
| 1:15-1:30 p.m. | Wrap up and Adjourn (John K. Bullard, Director of the Office of Sustainable Development, National Oceanic and Atmospheric Administration) |
| 1:30 p.m. | Lunch (Hosted by Cape Charles) |

II. Executive Summary

A. Introduction

In its report, *Sustainable America*, the President's Council on Sustainable Development (PCSD) recommended that "Federal and state agencies assist communities that want to create eco-industrial parks... [as] new models of industrial efficiency, cooperation and environmental responsibility" (p. 104). Broadly defined, an eco-industrial park (EIP) is a community of businesses that cooperate with each other and with the local community to efficiently share resources (information, materials, water, energy, infrastructure and natural habitat), leading to economic gains, improved environmental quality, and equitable enhancement of human resources for business and local community.

Case Studies Presented

Baltimore, MD
Brownsville, TX
Burlington, VT
Burnside, Nova Scotia
Cape Charles, VA
Tucson, AZ
Chattanooga, TN
East Shore EIP, CA
Minneapolis, MN
Plattsburgh, NY
Raymond, WA
Skagit County, WA
Shadyside, MD
Londonderry, NH
Trenton, NJ

This new approach to economic development provides a unique opportunity for communities to create jobs and protect the environment in a way that respects basic community values. Although the PCSD's recommendation grows out of its support of four demonstration projects, many other communities around the country are also working on eco-industrial development. Because all the communities face significant challenges to move EIPs from theory into practice, the PCSD's New National Opportunities Task Force, in conjunction with the Innovative State, Local and Regional Approaches Task Force, convened a workshop of practitioners working on EIPs. The workshop was designed to (1) provide a status report on eco-industrial projects around the country, (2) increase the potential for success for all EIP efforts, (3) identify key issues and how communities are addressing them, and (4) discuss strategies for marshaling the necessary resources, expertise, and investment to move forward.

Co-sponsored by the PCSD, the Town of Cape Charles and Northampton County, Virginia, the workshop brought together representatives from 15 communities, businesses, resource organizations and federal, state and local governments (See community list inset and more detailed descriptions starting on page 10). The workshop was held in conjunction with the ground breaking for the *Port of Cape Charles Sustainable Technologies Industrial Park*.

B. Findings

Eco-industrial development is a new model of economic development only recently being tested in communities around the nation. From the experiences of communities represented at the workshop, it is clear that long term progress will require the steadfast leadership, commitment and resources of governments, communities, and businesses (including the financial community). In addition, progress will require demonstrable benefits to business, quantifiable environmental results, as well as education, partnerships and community involvement. While it will take years, if not decades, to know whether society is making real progress in changing to this more sustainable model of economic development, it also is important to track short run progress to maintain momentum.

Workshop participants offered many excellent observations and suggestions for advancing eco-industrial development, which will be detailed in a subsequent proceedings document. Key findings and recommendations are summarized here:

PCSD interest and leadership have legitimized a new way of looking at economic development that balances a community's economic, environmental and equity needs.

According to workshop participants, PCSD has begun to meet its goal of building bridges among competing interests but has not yet completed the task.

There are different models of eco-industrial development. Examples from the workshop varied widely: (1) a zero-emissions eco-industrial park, where businesses locate at the same site, (2) a virtual eco-industrial park, where businesses form a loose affiliation or network of related regional companies, and (3) eco-development, where nonindustrial establishments apply industrial ecology principles. The examples also show that eco-industrial development may be driven by a community, a local government, a nonprofit organization or by business. Whatever the model or driver, participants generally agreed that eco-industrial development requires broad support and will benefit from collaborative strategies.

The role of the community has been important in nearly every case study. Public involvement has been central for most communities in developing a vision and plan, although in several communities local government, businesses and/or consultants have played a more central role. Those projects that have involved citizens early in the process have been able to rally the community around a common objective -- creating jobs, protecting the environment and preserving community social values. In general, however, communities lack the technical expertise or resources needed to develop their site's industrial ecology, design their baseline study, attract businesses and successfully manage an EIP. For this reason, they have looked to federal, state, and local resources to help launch their projects. In doing so, they have welcomed federal support, but would prefer that federal and/or state resources were consolidated to reduce transaction costs. Participants also suggest that political and community support has been needed to provide visibility and credibility to their planning and fundraising efforts.

EIPs need to attract a variety of tenants. Workshop participants recognize that EIPs will need to attract and nurture small businesses, incubator companies, local enterprises and environmental technology firms, in addition to any large corporate tenants they can attract.

Key Steps For Every Eco-industrial Park:

Forming an Industrial Ecosystem. An EIP must develop, at a minimum, an industrial ecosystem that reflects the linkage among the community's natural resources, existing & potential businesses, the transportation infrastructure, and material flows through the local and regional economy.

Attracting Tenants. An EIP needs to attract businesses that are compatible with the goals of the EIP and community, as well as create incentives for existing businesses to remain.

Management Structure. Managing a site involves many steps and can be approached in a variety of ways.

Financing. Private financing is critical to move projects beyond start up and for EIPs to become a common approach for economic development.

Performance Standards. Performance standards need to be developed and agreed upon during the design of the park.

Private financing has been difficult to obtain because financial institutions are not familiar with the potential for EIPs to lower risk and increase rates of return. Institutionalizing EIPs as a new paradigm for economic development will require (1) financing that can be provided by private sector financial markets, (2) development that can be done by firms now viewed as conventional developers, and (3) business profits that are comparable to, if not greater than, traditional business investments. Since this will take some time to accomplish, in the short term, governments, communities, and progressive businesses have an important role in helping launch, pilot and nurture eco-industrial development so it can eventually be financed and managed through market mechanisms.

Some environmental regulations discourage businesses from co-locating or partnering. Removing barriers to waste exchanges and allowing air emissions bubbling and trading at a particular site or within a region were two issues specifically identified by participants.

Although not yet proven in practice, workshop participants strongly believe business can improve performance and save money (i.e., eco-efficiency) by participating in eco-industrial parks. The belief is based on the promise of synergies, economies of scale, and potential reductions in risk and liability offered by EIPs.

Communication among practitioners should occur regularly and the exchange of information made easy. Participants agreed that sharing challenges, strategies and successes is critical to further progress.

C. Recommended Next Steps

Workshop participants identified many ideas for continuing development of EIPs. The list of recommendations is not exhaustive, but distills some important next steps and issues.

Step 1) PCSD should maintain a leadership role. Participants believe that PCSD serves a unique role that no other current organization can easily fill, namely, the ability to bring all stakeholders to the table as equal partners.

Step 2) Formalize the network of people working on eco-industrial development. Create an EIP association to continue building networks of current and potential EIP communities, provide technical support, and develop outreach to businesses and the financial community.

Step 3) A clearinghouse for information on eco-industrial development should be established. The clearinghouse could be a central location for literature and a World Wide Web Site. PCSD would be important to helping it get started, but would not itself need to host the clearinghouse.

Step 4) Easy community access to government-provided information and startup capital is critical. Attendees strongly recommend that the federal government coordinate with state and local governments and provide a one-stop resource center that more efficiently meet community needs. Funds for the one stop center could be drawn from a variety of supporting agencies.

Step 5) The financial services industry, in partnership with business, government and others, should develop a toolkit of financing strategies for use by communities.

Step 6) The PCSD should involve its own business members and other business representatives in creating support for EIPs. Businesses should be involved in (1) helping the financial community ensure that loans are available for all stages in the development of EIPs, including design, startup and strategic planning; (2) developing a dialogue with the financial services community about the safety and benefits of EIPs, Brownfields and Sustainable Communities as investment opportunities, and (3) providing data from existing pollution prevention and waste exchange efforts to estimate cost savings of an industrial ecosystem approach versus a traditional development approach.

Step 7) EPA, with support of PCSD, should identify and overcome regulatory barriers to hazardous waste exchanges. This could be done by creating a demonstration project for needed regulatory flexibility under the Resource Conservation and Recovery Act or Clean Air Act. The demonstration could be part of an existing Brownfield, enterprise zone, or Community XL project.

Step 8) A strong applied research program is needed to support EIPs and industrial ecology generally.

Step 9) Eco-industrial parks should be an important component of Brownfields redevelopment strategies and future legislation.

Step 10) The Joint Center for Sustainable Communities, in cooperation with PCSD, should educate local and state political leaders about the opportunities provided by the eco-industrial development paradigm.

Step 11) Hold another workshop on Eco-industrial parks in the Spring to continue the process begun at Cape Charles. Work with Brownsville, Texas to hold a follow up conference in March 1997. Brownsville is planning to hold a workshop for businesses that can either locate or support their eco-industrial development. PCSD should support this effort.

III. Introduction

In its report, Sustainable America, the President's Council on Sustainable Development (PCSD) recommended that "Federal and state agencies assist communities that want to create eco-industrial parks... [as] new models of industrial efficiency, cooperation and environmental responsibility" (p. 104). Broadly defined, an eco-industrial park (EIP) is a community of businesses that cooperate with each other and with the local community to efficiently share resources (information, materials, water, energy, infrastructure and natural habitat), leading to economic gains, improved environmental quality, and equitable enhancement of human resources for business and local community.

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Trenton, NJ

This new approach to economic development provides a unique opportunity for communities to create jobs and protect the environment in a way that respects basic community values. Although the PCSD's recommendation grows out of its support of four demonstration projects, many other communities around the country are also working on eco-industrial development. Because all the communities face significant challenges to move EIPs from theory into practice, the PCSD's New National Opportunities Task Force, in conjunction with the Innovative State, Local and Regional Approaches Task Force, convened a workshop of practitioners working on EIPs. The workshop was designed to (1) provide a status report on eco-industrial projects around the country, (2) increase the potential for success for all EIP efforts, (3) identify key issues and how

communities are addressing them, and (4) discuss strategies for marshaling the necessary resources, expertise, and investment to move forward.

Co-sponsored by the PCSD, the Town of Cape Charles and Northampton County, Virginia, the workshop brought together representatives from 15 communities, and various businesses, resource organizations and federal, state and local governments (See community list inset and more detailed descriptions starting on page 10). The workshop was held in conjunction with the ground breaking for the Port of Cape Charles Sustainable Technologies Industrial Park.

The purposes of the workshop were to: (1) summarize and provide a status report on eco-industrial projects around the country, (2) increase support and the potential for success for all EIP efforts, (3) identify key issues and how communities are addressing them, and (4) discuss strategies for marshaling the necessary resources, expertise, and investment to move forward.

The workshop included short presentations from 15 communities that are at some stage of eco-industrial development. Presentations and group discussions were also held on (1) Forming an Industrial Ecosystem, (2) Recruiting new Firms and Retaining Existing Firms, (3) Governance and Management Structures, (4) Strategies for Successful Community Involvement, (5) Finance, and (6) Setting and Maintaining Performance Standards. Finally, participants discussed critical questions and next steps for promoting sustainable eco-industrial development.

IV. Eco-Industrial Park Definitions

The PCSD's Eco-Efficiency Task Force Report (1996) described the eco-industrial park concept as an outgrowth of industrial ecology principles in which industrial activities are interconnected with one another and their supporting ecological systems. The report, moreover, suggests the potential environmental, economic and societal benefits that individual companies may reap by working collaboratively in an eco-industrial park. Because the concept was so new and only recently being piloted in communities around the country, the Task Force did not define the term "eco-industrial park."

To advance the dialogue about eco-industrial parks, workshop participants were asked to help generate a list of possible definitions of an "eco-industrial park." Following the workshop, participants were given an opportunity to vote on their first and second choice for a definition. Two definitions stood out in the voting of the 42 votes cast.

Receiving 15 first place votes and 19 total votes was:

"A community of businesses that cooperate with each other and with the local community to efficiently share resources (information, materials, water, energy, infrastructure and natural habitat), leading to economic gains, gains in environmental quality, and equitable enhancement of human resources for the business and local community."

Receiving 11 first place votes and 19 total votes was:

"An industrial system of planned materials and energy exchanges that seeks to minimize energy and raw materials use, minimize waste, and build sustainable economic, ecological and social relationships."

V. Eco-Industrial Park Profiles

A. Summaries

Fairfield Ecological Industrial Park -- Baltimore, Maryland. The Fairfield EIP encompasses over 1300 heavy industrial zoned acres and approximately 60 operating companies located in the South Baltimore Empowerment Zone. The site's superior port, rail, and interstate access will be used to maximize the intermodal transit of raw materials and waste streams, which will facilitate the creation of an industrial "closed loop" production process. The Fairfield EIP strives to demonstrate superior environmental and industrial results through: expanding pollution prevention programs; integrating innovative environmental technologies; engaging in creative Brownfields redevelopment; expanding business networks; streamlining State and City permitting processes; and in implementing an extensive master planning and fiscal impact analyses. Moreover, the Baltimore Development Corporation, along with a diverse pool of business, government, academic, union, and community stakeholders, is designing a new regulatory framework through the EPA's Project XL for Communities. Early successes at the EIP include: securing funds and initiating plans for the demolition and site preparation of a vital 30 acre industrial site; initiating a state sponsored pollution prevention mentoring program; "jump starting" Port of Baltimore expansion at Masonville; implementing a land swap and ordinance process; initiating new road and rail construction; and revitalizing a series of abandoned sites through new building and industrial redevelopment projects.

Brownsville Eco-Industrial Park -- Brownsville, Texas. The Brownsville project is based on a regional approach to materials exchange that will include connections to small businesses and agriculture. One key element is the design of an industrial process database to help in identifying potential linkages among existing and potential new companies.

Riverside Eco-Park -- Burlington, Vermont. The Riverside Eco-Park is an "ecological-industrial park" whose mission is to demonstrate and promote the commercialization of technologies that effectively utilize indigenous renewable resources that may be transferred to other communities that are interested in sustainable and ecologically sound development. The focus is on biomass energy production integrated with living systems and urban agriculture technologies on the principle of maximizing the utilization of renewable resources to provide electricity and heat applied to living systems that add value to wastes and expand the ability to grow food and flowers locally. Projects integrating biomass energy, living technologies and urban agriculture can be applied to many sites throughout the world to retain existing or to develop new businesses that are challenged with issues of economical energy supply, food production, and waste disposal. Thus, technology transfer will be a very important feature of the Eco-Park.

Burnside Eco-Industrial Park -- Halifax, Nova Scotia, Canada. This is a six-year multi-disciplinary, multi-institutional action research and education project involving an existing

industrial park with cooperative partnerships among academic, government, owners, developers, and tenants.

Port of Cape Charles Sustainable Technologies Industrial Park -- Cape Charles, Virginia. Managed by the Joint Industrial Development Authority of Northampton, the Park was designed as part of a comprehensive Sustainable Development Action Strategy. The EIP will incorporate industrial ecology linkages such as recycled water and by-product exchanges. Solar Building Systems, a manufacturer of photovoltaic panels that convert sunlight to electricity is the first tenant to locate.

Civano Environmental Technologies Park -- Tucson, Arizona. An eighty-acre commercial-industrial campus located within Civano, a 1,147 acre integrated development in Tucson's east side, is a private/public effort of Case Enterprises and the City of Tucson. The community will be the first major development in North America to unite Sustainable and New-Urban concepts in village planning. Civano will offer 3,000 homes in a full range of housing types and prices, extensive recreation and activities centers, a golf course, and green belts providing scenic pathways from homes to recreation and employment centers. The Environmental Technologies Park, which is planned as a center for sustainable technologies and practices, has begun construction for its first industrial tenant, Global Solar, a photo-voltaic cell manufacturer. All buildings in the park will be built to exacting "green" construction standards. Other firms currently in negotiation for relocation into the park include manufacturers of electric cars, wastewater/water purification systems, and passive solar water heaters.

Chattanooga, Tennessee -- The Volunteer Site. The site is 7,000 acres of land that was formerly a TNT manufacturing plant. Individual sites of up to 2,000 acres are available for use. ICI Americas Inc. has managed the site since 1953 and is interested in developing an eco-industrial park on the site. Targeted partners include warehouse/distribution companies, heavy and light manufacturers, companies that focus on environmental services, and other industries that re-manufacture and re-use existing products. The overall goal is to create over 10,000 jobs at the site by the year 2020 and create economic benefits by opening access through the plant and allowing local governments to use the facilities to provide services. ICI Americas is using the "clusters" approach to identify businesses that could share wastes as a way to attract and select tenants for the site. They have created a Business Development Center to assist in the recruitment of new businesses and plan to develop utility cost data to demonstrate how the eco-industrial park concept is cost competitive with other locations.

East Shore Eco-Industrial Park -- Oakland, California. The anchor for this EIP will be a resource recovery cluster encompassing reuse, recycling, remanufacturing, and composting companies. With this foundation, recruitment will target other tenants manufacturing from recycled feedstocks and renewable materials; firms making renewable energy equipment and systems; and environmental services ventures. The multi-county Economic Development Alliance for Business is sponsoring a project feasibility study to start in early 1997.

Green Institute Eco-Industrial Park -- Minneapolis, Minnesota. This small EIP is undertaking a baseline study of more than 600 industrial companies in the vicinity of its 3.5 acre site. The baseline study will be used to promote material and energy exchanges among these existing companies and to focus the tenant recruitment and business development efforts of the Green Institute's incubator program. The Green Institute project is also unique as a grassroots

neighborhood effort that incorporates environmental education and youth participation into many aspects of its programs.

Plattsburgh Eco-Industrial Park -- Plattsburgh, New York. With the assistance of Cornell University and U.S. Facilities Management, Inc., the Plattsburgh Airbase Redevelopment Corporation is designing an EIP for the 3500 acres of the decommissioned Air Force facility. The project emphasizes continuous improvement in economic and environmental performance through resource sharing, by-product exchanges, and an environmental management system conforming to ISO 14001. Elements of the EIP will include new development by manufacturers and transportation firms; ecological, cultural, and heritage tourism; environmental technologies; biomass generators; multi-modal distribution; and several "environmental enhancements" connected to the regional eco-system between Adirondack Park and Lake Champlain.

Raymond Green Eco-Industrial Park -- Raymond, Washington. The Raymond Green Industrial Park will be developed within a second growth coastal forest that will continue to be selectively harvested. The site encompasses the entire upper drainage basin of Butte Creek, thus the water quality within the site can be uniquely managed. Targeted firms include those that can make use of local natural resources and have low impact manufacturing processes.

Skagit County Environmental Industrial Park -- Skagit County, Washington. In the Fall of 1995, a feasibility study for the EIP was completed that identified potential sites, potential tenants, the projects economic prospects, and components of the EIP. It is expected that the park will include a recovery center built with energy efficient recycled content materials, manufacturing center, a community building, sales and marketing space, environmental businesses, and a closed loop system with minimal effluent and emissions.

Shady Side Eco-Business Park -- Shady Side, Maryland. Key features for this park include the renovation of an existing facility in an underemployed and under served community; integration of successful community-based tools and approaches; and the demonstration of Business Ecology Round tables. The Round tables are an innovative series of workshops and tools designed to help business and community leaders integrate economic, social and environmental goals. Possible tenants include a micro brewery, fish and shellfish aquaculture, marine exploration and technology, oil recycling, water reclamation, solar and renewable energy, and composting.

Stonyfield / Londonderry Eco-Industrial Park -- Londonderry, New Hampshire. Planners for the park are interested in using covenants to assure that industrial ecology is the model for future development. Using community and business input, Stonyfield Farms Inc. and the Town of Londonderry are working to develop the project.

Trenton Eco-Industrial Complex -- Trenton, New Jersey. Trenton's EIP will not necessarily be a physical place, but likely a network of businesses with numerous opportunities for linkages. The Eco-Industrial Roundtable - a multi stakeholder steering committee guides the activities of the project. Cornell University is conducting a baseline assessment to determine possible linkages between existing and future businesses.

B. Detailed Descriptions

Prior to the workshop, each community was asked to prepare responses to the following questions:

- What are your EIP's key features?
- What constitutes success?
- What are your EIP's linkages?
- What is your recruiting process?
- What resources do you have available?
- What is your strategy to continue progressing?
- What is missing?
- What are your goals for the upcoming workshop?

Their responses follow.

1. FAIRFIELD ECOLOGICAL INDUSTRIAL PARK

Baltimore, MD

Address: 36 S. Charles Street 16th Floor, Baltimore, MD 21201

Managing Entity: Baltimore Development Corporation

Contact Person's Name: Michael J. Palumbo

Phone: (410) 837-9310 ext. 341

Fax: (410) 837-6363

E-mail: MJPIII@aol.com

Alternate Contact Person: Larisa Salamacha

Phone: (410) 837-9310 ext. 340

Fax: (410) 837-6363

E-mail: N/A

EIP's key features.

- More than 1300 acres zoned for heavy industrial development. Approximately 60 businesses already operate within the ecological industrial park's primary boundary.
- Represents the only Empowerment Zone City grantee with a designed ecological industrial park.
- Pursuing a process to redefine the area's regulatory framework through EPA Project XL for Communities.
- Inter-modal transportation opportunities and mass transit commuting options which are intimately tied to economy redevelopment.
- Establishing business information networks within the park to expand collaborative efforts and material reuse opportunities.
- Playing a more active role in identifying industry education and training skill requirements and in establishing or coordinating linkages with training providers.
- Provides the State of Maryland to model a new voluntary compliance approach to Brownfields redevelopment.

- Completing a master planning exercise which will produce site ownership and environmental quality matrices, electric and natural gas line grids, inter-modal transportation and commuter alternatives, and infrastructure suggestions and priorities tied to promoting sustainable business practices.

What constitutes success?

- Demonstrate that environmentally motivated business networking leads to greater productive efficiency by lowering direct and indirect operational costs, while improving the cross-media environmental conditions of the site
- Preserve critical areas and decrease cross-media emissions and environmental impacts, improving the quality of living for neighboring residents.
- Create 2500 new jobs with above average wage scales over the next 5-10 years.

EIP linkages.

Hold multi-stakeholder contact and conferences, for example, to consider detailed input/output information for consideration in a material reuse exchange. Explore connections to targeted waste exchanges and to recruit potential environmentally technology oriented firms which may be able to use the existing waste streams and/or provides the raw material feedstock. We also are exploring the possibility of joint treatment facilities to improve the economics of scale related to these types of investments.

Recruiting process.

The recruitment and redevelopment strategy for Fairfield provides a unique focus and allows for considerably more opportunities to leverage State and Federal funds than more traditional development approaches. In addition to the obvious benefits associated with the Empowerment Zone, The Ecological Industrial Park targets its recruitment toward three specific company types. As a complement to the recruitment plan, BDC also had instituted an active existing business expansion and infrastructure improvement program. It is this combination of approaches that truly delineates the Eco-Industrial Park concept. The types of businesses being recruited or targeted for expansion include:

- Clean Manufacturing or Commercial Uses Which Practice Environmental Responsibility and Leadership: 1-3 significant size companies (350-500 employees) to expand the industrial/ commercial base of the area.
- Environmental Technology Providers: 8-10 environmental technology providers (50-100 employees) to expand the pollution prevention, business networking, and closed loop capabilities associated with the Eco-park.
- "The Multipliers" or Service and Other Environmental/Recycling Companies: 10+ small service oriented company's (10-50 employees) to fill in strategic needs created by the increased markets and demand generated through the Business expansion.
- Expanding Existing Employers: improve the regulatory environmental and operational conditions to help stimulate business expansion of existing firms, especially among those firms which possess excess property.

Resources available.

We currently receive direct funding through the Empower Baltimore Management Corporation which distributes funds from the HUD Empowerment Zone Grant. The Fairfield EIP also received funds through the Baltimore Development Corporation. Outstanding funding proposals

for specific activities outlined in the EIP Strategic Plan have been or will soon be submitted to the Economic Development Administration, the Environmental Protection Agency, and Maryland Department of Economic and Business Development, the Maryland Department of the Environment, and the Department of Energy. In addition, private funding is being pursued through local and national lending institutions, social investment and venture capital funds, local foundations, and EIP membership obligations.

Strategy to continue progressing.

Our comprehensive redevelopment strategy is illustrated by the attached exhibit.

What is missing?

Assistance is needed in the following areas:

- Secure and reliable site assessment information and support for Phase I site assessments.
- Information related to cost or efficiency improvements associated with environmental technology or pollution prevention integration.
- Creating significant and meaningful incentives to motivate firms to operate in a manner that would stimulate sustainable practice, i.e. market driven advantages for "green" or environmentally conscious manufacturing processes and products such as "preferable products" designation or public sector purchasing targets.
- Provide technical assistance or funding that would support the integration of pollution prevention, environmental technology, and material reuse integration, i.e. detailed input/output analyses which expose innovative ways to reuse resources.
- Provide collective waste water treatment, energy co-generation, and emission reduction models or strategies, analyses, or information.
- Provide funding for the creation of an eco-manufacturing research facility including education and training provisions to prepare workers for new occupational growth in environmental industries.

Goals for the upcoming workshop.

- To share ideas about conducting a wide variety of support activities which promote business expansion, job creation, and community redevelopment, while implementing the characteristics of an ecological industrial park.
- To share ideas and successes to demonstrate that economic growth can occur without having a greater negative impact on the environment.
- To build partnerships to ensure that the ecological industrial park concept becomes a traditional way of doing business in the 21st century.

2. BROWNSVILLE ECO-INDUSTRIAL PARK

Brownsville, TX

Address: 1205 N. Expressway, Brownsville, TX 78520

Managing Entity: Brownsville Economic Development Council

Contact Person' Name: Rick Luna, Director of Communications/Research

Phone: (210) 541-1183

Fax: (210) 546-3938

E-Mail: broedc@aol.com

Alternate Contact Person: Jackie Lockett, Brownsville Information & Solutions Network
Phone: (210) 546-1161
Fax: (210) 982-1876
E-Mail: bisn@triplesoft.com

EIP's key features:

The Brownsville project is based on a regional approach to materials exchange (regional "industrial symbiosis" (IS). Establishment of a defined "eco-industrial park" is considered as one possible component of regional IS, but not the driving force. Brownsville IS also is inclusive of small businesses and agriculture.

What constitutes success?

Project will yield an industrial IS "road map" identifying opportunities to increase the operating efficiencies of existing industries and opportunities for recruitment of new industry in the Brownsville region.

EIP linkages:

We have developed an industrial process data base both of companies existing in Brownsville and Matamoros, Mexico and in industries elsewhere in the U.S. Our consultant has developed analytical procedures to identify potential materials exchange linkages among these industries for both existing and new companies.

Recruiting process:

Planning tools developed for the Brownsville project identify potential firms likely to benefit from participation in regional industrial symbiosis. Tools also quantify and value materials for exchanges. Then potential firms, new or existing, are contacted to discuss opportunities for cost savings.

Resources available?

U.S. Department of Commerce
Brownsville Economic Development Council
City of Brownsville, Port of Brownsville

Strategy to continue progressing.

1. Cost data need to be added to materials flow data base (consultant)
2. Marketing plan is to be developed for strategy to evaluate and contact IS participants (BEDC)

What is missing?

1. Additional process detail (input, output, utilities flows will increase rigor of planning tools)
2. Cost data are yet to be developed
3. A more efficient method of identifying "new" industry opportunities will speed process

Goals for the upcoming workshop.

1. Brief other projects on status of Brownsville project.

2. Demonstration of uniqueness of our approach.

3. RIVERSIDE ECO-PARK

Burlington, VT

Address: The Intervale, Burlington, VT 05401

Managing Entity: Burlington Electric Department (interim)

Contact Person's Name: Steve Burroughs, General Manager

Phone: (802) 865-7406

Fax: (802) 865-7400

E-mail: gmatbed @ aol.com

Alternate Contact Person: Robert Skiff

Phone: (802) 656-3833

Fax: (802) 656-8678

E-mail: N/A

EIP's key features.

The Riverside Eco-Park is an Agricultural-Industrial Park in an Urban setting. Its focus is two-fold:

- Bio-Energy - green electricity generated using bio-mass fuels
- Living System - living machines, which capture available thermal energy for commercial greenhouse production of fish, organic vegetables, and water purification.

What constitutes success?

Success will be the integration of these two existing but separate emerging technologies systems into one closed loop demonstration project which is transferable to the communities.

Measurements for a positive outcome are qualitative and quantitative

- reduced dispersion of generating station "waste" heat into the air and water
- improved environmental condition - soil and water quality, recycling volume increases
- increased self-sufficiency for the community in percent of food produced locally
- creation of sustainable jobs and training programs appropriate to our region
- increase of recreational and educational opportunities for area residents

EIP linkages.

The two emerging technology systems of bio-energy and living systems have been analyzed for compatibility through the process of a feasibility study. This study took input and outflow data from both systems, as well as current procurement practices and waste dispersion, and matched them to achieve theoretical improvement in efficiencies for both systems, joined in closed-loop.

Our next step will be the schematic engineering and cost analyses of this system, followed by an urban farm demonstration project to test and fine-tune viability.

Recruiting process.

Our EIP has identified a unique geographic area, and established its existing natural and economic resource strengths. The McNeil Generating Station, Living Technologies, Gardener's Supply Company, and the Intervale Foundation are located on a fertile tract of 680 acres of underutilized urban agricultural land. Additional companies will be added or recruited as the patterns, strengths, and weaknesses of the first demonstration project unfold.

Our ultimate hope is to take our two base systems of bio-energy and living systems from research and development, through commercialization, to spin-off industry creation at this site. The creative products of this process will then be fed back to our eco-park structure for expansion, as well as to other sites, and the creation of other eco-industrial structures.

Resources available.

Sources for funding to date for our feasibility study are:

- Community development Block Grant - \$9500
- Burlington Electric Department - \$9800
- Department of Public Works - \$5000
- In-kind contributions for
 - GIS CADD data base drawings and planning
 - Waste heat data analysis
 - Project administration

Applications have been made to EPA and DOE for Phase 2 funding.

Strategy to continue progressing.

A multi-agency collaborative approach to funding and support is critical and sensible. We are working with the Department of Energy to design a process for federal agencies to cooperate on projects such as ours that cross the lines of Departments of Energy, Commerce, EPA, and USDA or others as examples.

What is missing?

Information and tools that would help us implement our plans might include:

- Planning and zoning strategies for low-impact industries
- Funding sources for EIP planning and implementation
- Research and development data on EIP systems already in place
- Case studies on existing EIPs
- Interagency cooperation - a central clearinghouse approach to information and resources

Goals for the upcoming workshop.

We are hoping to get a one-stop comprehensive snapshot of EIP development in the country, to evaluate and improve our own approach, and to share our best and most successful ideas with others. This should be an excellent forum, and may result in good ideas to continue the momentum of information exchange after October 18th.

4. BURNSIDE ECO INDUSTRIAL PARK

Halifax, Nova Scotia, Canada

Address: 1312 Robie Street, Halifax, Nova Scotia B3H3E2

Managing Entity: Burnside Industrial Park as Ecosystem

Contract Person's Name: Raymond Cote

Phone: (902) 494-3632

Fax: (902) 494-3728

E-Mail: N/A

Alternate Contact Person: W. Wayne Barchard

Phone: (902) 426-4695

Fax: N/A

E-Mail: N/A

EIPs Key features.

Burnside Project

- 6 year multi-disciplinary, multi-institutional study of requirements;
- cooperative partnership among academics, 3 levels of government, owners, developers and tenants;
- phases/retrofitting and planning;
- innumerable, constantly changing SMEs.

What constitutes success?

- Commitment from park owners;
- Flexibility in implementation of Environmental regulations;
- Participation by capital owners;
- Appropriate economic instruments;
- Active information, education and interpretation; and
- A technical extension service.

EIP linkages.

- System Definition [Surveys and database]; Industrial, social, brainpower inventories
- Food Web [Materials Flow Database];
- Energy Conservation [Energy Audits];
- Resource Conservation [Waste Audits, and Materials Exchange];
- Scavengers and Decomposers [Recyclers and Waste Managers];
- Information Exchange [Cleaner Production Centre Business Leaders Forum, Newspaper Column].

Recruiting process.

(Not yet developed)

Resources available.

- Federal-Provincial Sustainable Development Fund;
- The Donner Foundation;
- Halifax Regional Municipality; and
- Federal and Provincial Governments three Academic Institution

Strategy to continue progressing.

- United Nation Environmental Program-Industrial Estate Guideline;
- Work with the new HRM Industrial Development Commission;
- Revision of the Regulatory Structure (Sewer Bylaw, Solid Waste Strategy, Provincial and Federal Acts);
- Federal and Provincial Pollution Prevention Strategies;
- Newest Phases of Burnside using some of the Design Criteria; and
- Continuation of Leader's Forum, regular Newspaper columns.

What is missing?

- Firm commitment by the owners, builders and capital managers;
- A supportive Regulatory Structure; and
- Stable funding for the Extension Program.

Goals for the upcoming workshop.

5. PORT OF CAPE CHARLES SUSTAINABLE TECHNOLOGIES INDUSTRIAL PARK

Eastville, VA

Address: P.O. Box 530, Eastville, VA 23347

Managing Entity: Joint Industrial Development Authority of Northampton

Contact Person's Name: Timothy Hayes

Phone: (757) 678-0477

Fax: (757) 678-0483

E-Mail: northampton@esva.net

Alternate Contact Person: Thomas Harris

Phone: (757) 678-0440

Fax: (757) 678-0483

E-Mail: northampton@esva.net

EIPs Key features.

- Provides the infrastructure for industrial ecology linkages among companies.
- Improves the economic, natural, cultural, and social and living environment of the site and the surrounding region.
- Designed by the community as part of a comprehensive Sustainable Development Action Strategy with mixed use, and a nature preserve.
- Zero Emissions Design.

What constitutes success?

- Private for-profit investment in new companies and expansion of existing companies in the Park.
- Jobs created for local people.
- Employee-owned companies created by local people.
- Natural and cultural resources protected and maintained.

EIP linkages.

- Providing for water recycling within the Park through a used water collection system, water recovery facility and recycled water distribution system.
- Plan to form a technical panel to analyze by-products of existing and proposed companies for potential use by other existing, and proposed companies.
- Mixed residential, commercial, industrial uses.

Recruiting process.

- Providing the infrastructure necessary for companies to operate successfully - product.
- Providing land, utilities, services, amenities at competitive rates - price.
- Part of National Historic District - Town of Cape Charles.
- Surrounding town and county maintaining its spectacular natural, historic and living environment - place.
- Strategic alliance with Eastern Shore Economic Development Commission and Virginia Economic Development Partnership - promotion.

Resources available.

- Local - Northampton County and Town of Cape Charles purchasing and providing land and partial design funds.
- Region - Eastern Shore Resource Conservation and Development providing partial construction funding.
- State - Virginia Coastal Program, Department of Transportation, Department of Conservation and Recreation providing partial design and construction funding; Virginia Department of Housing and Community Development.
- Federal - U.S. Department of Commerce, National Oceanic and Atmospheric Administration, Economic Development Administration, U.S. Department of Agriculture, U.S. Department of Interior, U.S. Fish and Wildlife Service and U.S. Environmental Protection Agency.

Strategy to continue progressing.

- Project managed by County Department of Sustainable Economic Development/Joint Industrial Development Authority.
- Covenants to be established based on master plan and design and operation standards.
- Recruitment process focusing on industrial ecology components to be developed and implemented.

What is missing?

- How to establish an effective process for developing, facilitating, managing an industrial eco-system.
- In conjunction with above, establishment of an effective marketing/recruitment program.
- Construction of Flex/Incubator space for lease to small/medium size companies within the park.

Goals for the upcoming workshop.

- Start of an ongoing network of EIP developers/operators.
- Find out how other EIP's are achieving success and overcoming similar challenges as we are.
- Identification of potential additional funding/investment sources.

6. CIVANO INDUSTRIAL ECO-PARK

Tucson, AZ

Address: 6280 S Campbell Avenue, Tucson, AZ 85706

Managing Entity: Community of Civano LLC

Contract Person's Name: David Case

Phone: (520) 889-8888

Fax: (520) 889-6207

E-Mail: casent@primenet.com

Alternate Contact Person: John Laswick

Phone: (520) 791-5093

Fax: (520) 791-5413

E-Mail: N/A

EIPs Key features.

The Civano business park is part of an integrated development that emphasizes human interaction and environmental responsibility. The businesses that are being sought will enable the Civano business park to become a center of sustainable technologies and practices. Civano will become more like an EIP as it becomes more like a "virtual corporation" where businesses with certain core capabilities (e.g., makers of PVs, electric vehicles, circuit boards, steel fabricators, design firms, renewable construction, etc.) come to coordinate their activities, share resources, and participate in joint operations, such as water treatment, and reduce dependence on transportation and increase competitiveness.

What constitutes success?

The current aim is to attract companies that fit into the general concept of a sustainable community. At present, the chief measure of success, besides simply being a viable business district, is to succeed in attracting critical "flagship" companies that both set the philosophical tone for the business development thru the use and production of renewable resource technologies and also promote the idea of a business park that is center for sustainable technologies.

EIP linkages.

Prior to the purchase of the Civano land by the current developer, the City of Tucson organized

two major workshops on business development at Civano. These brought together business, financial, academic, and other organizations that are interested in the idea of a business district with distinctive characteristics. The Metropolitan Energy Commission, which originated Civano, and the City have developed new resource-efficient building codes and builder training programs for Civano which will be used to promote sustainable technologies and will likely form part of the economic incentive for certain types of businesses. The local and state economic development agencies are including Civano in their recruitment and expansion programs.

Recruiting process.

In addition to including Civano in the recruitment programs of the Greater Tucson Economic Council, a Civano Institute is being created to conduct training programs for local builders in the Civano building techniques and to promote the concept of sustainable building technologies throughout the community. Other agencies, such as a new university and the local community college have campuses in the area and both have sustainable technologies programs. Both have expressed an interest in working with Civano.

Resources available.

Original funding for developing the Civano concept came from a \$600,000 grant/loan from the State of Arizona Department of Commerce. These funds were repaid when the current developer purchased the Civano property from the State. Of course, the developer is organizing aggressive marketing and recruitment campaigns. In addition, many thousands of hours of volunteer time have been contributed for at least 10 years to develop the concept of Civano and bring it to the current state.

Strategy to continue progressing.

Civano is an integrated residential development with an important business component. In that context, some of the key pieces include the development of a marketing plan, identifying and signing leases with "flagship" companies, and the implementation of the Civano Institute and the Civano builder program.

What is missing?

Chiefly, examples of EIPs that will show how to develop a marketing plan and infrastructure plan that will make Civano an attractive business property, without "breaking the budget." We need a better understanding of the characteristics of EIPs that provide competitive advantages over traditional business developments.

Goals for the upcoming workshop.

Understanding and examples.

7. THE VOLUNTEER SITE

Chattanooga, TN

Address: 6703 Bonny Oaks Drive (mail: P.O. Box 22608)

Managing Entity: ICI Americas, Inc.

Contact Person's Name: Charles "Sid " Saunders

Phone: (423) 855-7256

FAX: (423) 855-7270

E-mail: N/A

Alternate Contact Person: T.R. AndradeMatt
Phone: (423) 855-7252
Fax: (423) 855-7270
E-mail: N/A

EIP's key features.

- 7,000 acre parcel of land interlaced with utilities and transportation infrastructure.
- Individual sites of up to 2,000 acres are available for commercial use.
- A business development center to help establish new businesses.
- A national environmental test center to develop environmental technologies are on site.
- Civilian organizations can use facilities, land equipment of this standby U.S. Army Ammunition Plant to produce their own services and products.

What constitutes success?

- If we are able to create 10,000 jobs at the site by year 2020.
- Establish cooperative arrangements with local governments to use the facilities to provide services.
- If the Volunteer Site can become a model for converting National military assets to the civilian sector.
- Maintain capabilities for the Volunteer Site at no cost to the Army.

EIP linkages.

- The Volunteer Site is using the "cluster" approach to target specific industries.
- Provide a National Environmental technology demonstration center to perform research, testing and evaluation.
- Establish an academic center of excellence for sustainable development and environmental management.
- "Phased development" is being implemented with parcels of land allocated to each phase. The 650 acre "Brownfield" site is being commercialized first.

Recruiting process.

- Using the "Center" industry approach where industries can share common utilities.
- Utilize the U.S. Army's strategic environment research and development environmental test site at Volunteer to recruit new and emerging environmental technology businesses.

Resources available.

Under the Congressionally funded Armament Retooling Manufacturing Support (ARMS) initiative, over \$100 million has been expended since 1993 to facilitate implementation of the facilities - use strategy, over \$10 million of these ARMS funds are scheduled for use at the Volunteer Site in 1996.

Strategy to continue progressing.

- Increase the Business Development Center activities to assist in recruitment and establishment of new businesses.

- Develop utility cost data and identify ways to be cost competitive with other locations.

What is missing?

- Information/models to assist in identifying "cluster" industries as prospective tenants for the Volunteer Site.
- Sources of financing to assist new business start-ups coming to the site.

Goals for the upcoming workshop.

- Share information about the Volunteer EIP site.
- Learn about the activities at other EIP's.
- Establish contacts with parties that can help the Volunteer Site reach projected goals.

8. EAST SHORE ECO-INDUSTRIAL PARK

Oakland, CA

Address: 6423 Oakwood Dr., Oakland, CA 94611
 Managing Entity: Indigo Development and Urban Ore
 Contact Person's Name: Ernest A. Lowe (Indigo)
 Phone: (510) 339-1090
 Fax: (510) 339-9361
 E-mail: elowe@indigodev.com

Alternate Contact Person: Dan Knapp (Urban Ore)
 Phone: (510) 235-0172
 Fax: (510) 235-0198
 E-mail: N/A

EIP's key features.

- The anchor for this EIP will be a resource recovery facility encompassing reuse, recycling, remanufacturing, and composting. (We have five companies now looking to move and expand their operations.)
- Our recruitment strategy will build from this base to include other companies including plants in the park's vicinity, whose participants and energy inputs or outputs will help build a web of by-product exchange. Other potential recruits will be in areas of new renewable materials and energy manufacturing.
- The project will demonstrate the potential for reindustrialization based on emerging trends toward a resource efficient and renewable energy and materials economy.
- Site selection and planning will emphasize ecological values in balance with economic issues. The site will be "landscaped" to reflect native ecosystem characteristics.
- Design of the park infrastructure and buildings will emphasize energy efficiency, use of renewable energy and material, and pollution prevention.

What constitutes success?

- Traditional economic development and financial values will be met in balance with ecological values.
- Park performance objectives will reflect this balance and insure continuous improvement.
- Community support for the project will be strong because it will provide jobs for those who need them in industry that safeguards their environment.

EIP linkages.

- The by-product exchange network strategy will be implemented through a survey of potential recruits, surveys of neighboring businesses, study of county waste stream reports, and workshops with potential recruits. In addition, a business incubator will be set up to support development of new businesses to fill niches in the exchange.

Recruiting process.

- A coalition of the Recycling Market Development Zone, the Alameda County Waste Management Authority and Recycling Board, and local and state economic development agencies has already been established.
- The business incubator and entrepreneurial support network will support development of successful new firms for the park.

Resources available.

Initial organization has been supported by in-kind contribution of the Economic Development Advisory Board. We are seeking Economic Development Administration and/or local foundation funds for site selection and feasibility studies. Our intention is to do the actual real estate development through private investment.

Strategy to continue progressing.

- Basically, we will use standard real estate development management strategies, while tracking all of the environmental/ecological issues involved.
- FIWP funding for feasibility study.
- Evaluation and selection of sites. Environmental impact assessment.
- Move quickly enough to meet the needs of the resource recovery firms planning expansion.

What is missing?

An adaptation of standard development pro forms to reflect values like life cycle costing of alternative park and building infrastructure options that may cost more initially but yield major savings over the lifetime of the facility. And to back that up, lenders and investors need encouragement to recognize this more systemic financial analysis.

Goals for the upcoming workshop.

Better understanding of how other projects are addressing EIP development, what they're learning, how they define their projects.

9. GREEN INSTITUTE ECO-INDUSTRIAL PARK

Minneapolis, MN

Address: 433 E. Franklin Avenue, Suite 7A, Minneapolis, MN 55404
Managing Entity: Green Institute
Contact Person's Name: Michael Krause
Phone: (612) 874-1148
Fax: (612) 874-6470
E-mail: N/A

Alternate Contact Person: Annie Young
Phone: (612) 874-1148
Fax: (612) 874-6470
E-mail: young@freenet.msp.mn.us

EIP's key features.

This project was not initiated by a government agency or institution of higher learning, but by a grassroots neighborhood effort. It is unique in its attempt to develop an EIP on a small site of just 3.5 acres by integrating existing businesses into the project. The project is also unique in its commitment to incorporate environmental education into all aspects of the project.

What constitutes success?

The Green Institute is employing the EIP and green business incubator and a sector strategy to create 200 living wage jobs. We will measure success by the number of jobs created and by the ability of people from the Phillips neighborhood, the poorest and most diverse neighborhood in Minnesota, to get and keep those jobs.

EIP linkages.

We are designing a baseline study this fall with implementation to follow in early 1997. The study is being designed by Green Institute staff and a student/faculty team at the University of Minnesota. The baseline study will look at existing core and secondary businesses within the vicinity of the proposed EIP and analyze raw material uses and waste generation as well as basic economic data. The study is expected to identify opportunities for material reduction, reuse and exchange with other businesses. It will also focus the tenants' recruitment and business development efforts of the project by identifying gaps in closed potential loop business cycles.

Recruiting process.

The Green Institute is drafting criteria for tenants in the industrial park and has established a business development program targeted at "green businesses." The main strategy for integrating existing businesses into EIP is through the baseline study described above and existing programs such as the Materials Exchange (MAX) program, and the Minnesota Technical Assistance Project (MATAP). Tenant recruitment is part of the work responsibilities of a Business Development Specialist staff position. In addition, signage on the proposed site and earned media have generated a substantial number of inquiries from firms engaged in environmental industries.

Resources available.

- The Green Institute EIP has received funding through the Federal Enterprise Community program and the local Neighborhood Revitalization Program. The project has also been supported by foundations, including the Minneapolis Foundation and the Northwest Area

Foundation. Construction costs for the EIP are estimated at \$6 million of which about \$1 million has been identified from government and foundation sources.

- About \$2 million will be financed as debt on the project leaving \$3 million to be raised as part of a capital campaign in 1997.

Strategy to continue progressing.

A detailed work plan and time line are being developed for the staff and board in 1997. The critical next steps include: 1) contract for services with the architectural team recently selected; 2) design and implementation of the baseline study; 3) initiate and implement a capital fundraising campaign; and 4) establish a business development program and build staff capacity.

What is missing?

- Models of tenant mixes that would constitute an eco-industrial park of various sizes from a few acres to thousands of acres.
- Strategies for overcoming concerns about proprietary information and regulatory burdens when analyzing the material inputs and waste generation of private businesses.
- Market analyses of the potential for optimal tenants within a given geographic area.

Goals for the upcoming workshop.

Establish contacts with other EIPs and learn about other strategies and obstacles to development. Identify capital sources and other resources that can assist in development. Answer some detailed questions with some one-on-one meetings with key EIP participants.

10. PLATTSBURGH ECO-INDUSTRIAL PARK

Plattsburgh, NY

Address: 426 U.S. Oval, Suite 1000, Plattsburgh, NY 12903
Managing Entity: Plattsburgh Airbase Redevelopment Corporation
Contact Person Name: Mark L. Barie
Phone: (518) 561-0232
Fax: (518) 561-0686
E-mail: N/A

Alternate Contact Person: R. Bruce Steadman
Phone: (518) 566-6210
Fax: (518) 561-2422
E-mail: N/A

EIP's key features.

- Inter-modal/multi-modal capabilities including air, rail, highway, water.
- Former Air Force Base on Lake Champlain.
- ISO 14000/EMS Umbrella Program.
- 3500 contiguous areas with research, commercial, recreational, and industrial facilities.
- Emphasis on resource and waste management and sustainability.
- Proximity to Canadian Border and 1-hour to Montreal.
- Emphasis on lowered environmental cost and improved environmental performance.

What constitutes success?

- Achieving the Environmental and Economic goals stated in our plan.
- Becoming the first multi-modal EIP with ISO 14000/EMS Programs in U.S.
- Attraction of Global Companies using our EIP to redistribute goods, set-up a Manufacturing operation, or use regional resources for R&D.;
- Successful linking of our Regional Resources into innovative R&D; opportunities

EIP linkages.

- Input/output analysis of Regional Economy/Resources.
- Stakeholder interviews and focus groups to foster creative thinking.
- Facilitating Partnerships and Joint Ventures between Regional Resources.
- Marrying Economic and Environmental Goals at the beginning of Redevelopment.
- Emphasizing continuous improvement in achieving Economic and Environmental Goals.

Recruiting process.

- Inputs/outputs of Region being marketed to users/providers from outside Region.
- Emphasizing Region's commitment to quality by adopting an EIP with ISO 14000/EMS Programs to lower environmental cost and improve performance.
- Facilitating communication between Regional Resources to identify leads opportunities, partnering opportunities and projects.

Resources available.

- EPA Region I has financed Phase I of Action Plan with \$70,000.
- Opportunities for NY State Environmental Bond Act \$\$ and Federal \$\$ are being pursued.
- Regional Resources are being pursued through public outreach programs.
- PARC has committed in-kind resources to help in establishing our goals.

Strategy to continue progressing.

- Completion of Phase I Baseline Study.
- Completion of concurrent marketing plan to attract prospects
- Establishment as # 1 US EIP based on location, infrastructure, action plan, commitment, activities, management team, and progress.
- Location of implementation funds for Phase III (see our strategic plan).

What is missing?

- Expanded public outreach and stakeholder involvement in generating leads for prospects, innovative ideas, partnering opportunities.
- Model EMS program based on ISO 14000 to lower environmental costs and improve performance, EPA and NY SDEC and Air force must buy into this EMS to help attract prospects.

Goals for the upcoming workshop.

- Networking with Federal and PCSD officials, who may provide support, input, and implementation funding.
- Exposure to prospects will find the multi-model, ISO 14000, Northeast EIP attractive for business (costs down/profits up) and environmental reasons.

11. RAYMOND GREEN ECO-INDUSTRIAL PARK

Raymond, WA

Address: 230 Second Street, Raymond, WA

Managing Entity: City of Raymond

Contract Person's Name: Rebecca Chaffee

Phone: (260) 942-3451

Fax: (360) 942-5616

E-Mail: N/A

Alternate Contact Person: Jim Neva

Phone: (360) 942-3422

Fax: (360) 942-5865

E-Mail: N/A

EIPs Key features.

The Raymond Green Industrial Park will be developed within a second growth coastal forest that will continue to be selectively harvested. The site encompasses the entire upper drainage basin of Butte Creek. Thus, the water quality within the site can be uniquely managed. The park will not be linked to traditional offsite wastewater and solid waste infrastructure systems. Waste streams will be treated and recycled on the site.

What constitutes success?

This project will be successful if the natural biodiversity and productivity of the forest can be maintained while sharing the same site with environmentally sensitive manufacturing businesses which create jobs and expand the local natural resource-based economy.

EIP linkages.

This project had focused on waste handling both for manufacturing businesses within the park and for the surrounding region. A basic premise of the project is that wastes generated will not be transported to already overloaded local wastewater and solid waste facilities.

Recruiting process.

Firms will be targeted that make new uses of local natural resources with low impact manufacturing processes.

Resources available.

To date this project has been initiated through a local partnership between the City of Raymond, the Port of Willapa Harbor, Weyerhaeuser Company, Ecotrust, a non-profit corporation dedicated to developing a sustainable economic base in the coastal forests of the Pacific Northwest, and Shoretrust Trading Group. Planning resources and technical assistance have been provided by the State of Washington.

Strategy to continue progressing.

This green industrial park had been successfully kept on track through the efforts of an active local task force and frequent newspaper coverage. The task force is working with state and federal staff in a process created by President Clinton's timber initiative which focuses resources on priority community economic development projects. The green industrial park is the top ranked project in Pacific County.

What is missing?

This project requires additional technical and financial assistance to plan and develop the onsite infrastructure needed to support the resources processing businesses that will be located in this green industrial park.

Goals for the upcoming workshop.

Our goal for the workshop is to bring new ideas, information and resources home to help in our effort to build a viable sustainable economy in our rural Wills' community.

12. SKAGIT COUNTY ENVIRONMENTAL INDUSTRIAL PARK

Skagit County, WA

Address: (No address, still in planning)
City: Mt. Vernon State: WA Zip: 98273
Managing Entity: TBA
Contact Person's Name: Kevin Morse
Phone: (360) 336-6114
Fax: (360) 336-6116
E-mail: eip@edasc.org

Alternate Contact Person: Don Wick
Phone: (360) 336-6114
Fax: N/A
E-mail: N/A

EIP's key features.

The key features of our EIP that differentiates it from a typical industrial park are:

- a recovery center built with energy efficient recycled content materials
- a manufacturing center
- a community center
- a sales and marketing center
- an environmental business center
- a closed loop system with minimal effluent and emissions
- highly visible park

What constitutes success?

Success for our EIP project will be indicated by:

- Land acquisition and infrastructure development
- The creation of safe, healthy, family wage jobs

- Minimal environmental impact
- Community support
- The self-sustenance of the venture
- The provision of recyclables to vital outlets
- The provision of revenues to replace money originally extracted from the now non-operational resource recovery facility

EIP linkages.

Development Steps:

- Feasibility study completed Fall of 1995
 - Identified three potential sites
 - Potential tenants
 - Local expansion and out of state relocation
 - Outlined components of EIP (see Executive Summary)
 - Economic Feasibility
- Recruitment of anchor tenants (in process)
- Recruitment of capital and development partners (in process)
- Working with state legislators to create incentives for green industries

Recruiting process.

We have done a feasibility study identifying local businesses interested in expansion or relocation to an industrial park. Currently, we are working with existing companies to acquire capital for expansion and equipment purchases. Throughout the history of the organization we have worked closely with the Washington State Department of Community Trade and Economic Development. Attempting to recruit new companies and gather information, we have attended many trade shows and conferences.

Resources available.

- The Environmental Industries Park has pulled funding from a number of sources.
- The Skagit County Government and the Economic Development Administration funded a feasibility study. Currently, we are seeking to fund land acquisition and infrastructure development. We have also received funding from the Forest Service for community revitalization. This contract will fund anchor tenant recruitment efforts.

Strategy to continue progressing.

In order for the Environmental Industries Park to progress, development partners will need to make a serious commitment of their capital and time. Until this is accomplished, progress will be slow.

What is missing?

Expertise in industrial development would help implement our EIP plans. Financing is crucial for our EIP's survival. An executive loan program would be welcomed. An industrial specialist from the public or private sector lent to our program for two years would make a world of difference.

Goals for the upcoming workshop.

I hope to learn from the struggles of other EIP developers and get more contacts within the EIP community. While there, I hope to make contacts for receiving funding and development

assistance. I want to provide insight and lessons learned to policy makers so they can generate federal assistance.

13. SHADY SIDE ECO-BUSINESS PARK

Shady Side, MD

Address: 4800 Atwell Road, Shady Side, MD 20764-9546

Managing Entity: Business Ecology Network (BEN)

Contact Person's Name: Joe Abe, President

Phone: (410) 867-3596

Fax: (410) 867-7956

E-mail: abe@naturaledge.org

Alternate Contact Person: Gregg Freeman, Development Director

Phone: (410) 266-3216

Fax: (410) 266-8950

E-mail: Eloggie@aol.com

EIP's key features.

- Renovation of an existing facility in an underemployed and underserved community.
- Integration of successful community-based tools and approaches from U.S. and abroad such as visioning, strategic planning, mapping of important resources and sites, and sustainable indicators.
- Refinement and demonstration of Business Ecology Round tables, an innovative approach for integrating profitability, stakeholder participation, and environmental performance
- Park ecosystem may include the following business: micro brewery, fish and shellfish aquaculture, a marine exploration and technology firm, an oil recycling business, an ecologically-designed water reclamation system, solar and renewable energy, and a compost business.
- Integration of the Internet, video and audio tapes, local printed media, and town meetings to reach stakeholders and communicate projects' progress.
- Demonstrating linkages among ecosystem healths, the food system, community health, and economic opportunity.

What constitutes success?

- Economic, social and environmental goals are mutually achieved, creating powerful synergies that ripple within and outside the community.
- The community, businesses and the environment are so intertwined and mutually supportive that it's difficult to see where the boundaries between these systems begin and end.

EIP linkages.

1. Define the context, stakeholders and vision.
2. Develop and implement a communications strategy.

3. Develop a strategic plan for an eco-business park/community development center.
4. Implement the strategic plan.
5. Maintain the integrity and viability of the eco-business park/community development center.

Recruiting process.

This is proprietary information.

Resources available.

This is proprietary information.

Strategy to continue progressing.

This is proprietary information.

What is missing?

BEN has developed its Round tables process to support eco-business park development.

Goals for the upcoming workshop.

- Create strategic alliances and new opportunities.

14. STONYFIELD LONDONDERRY ECO-INDUSTRIAL PARK

Londonderry, NH

Address: 50 Nashua Road, Suite 100, Londonderry, NH 03053

Managing Entity: Town of Londonderry

Contact Person's Name: Peter C. Lowitt

Phone: (603) 432-1134

Fax: (603) 432-1128

E-mail: N/A

Alternate Contact Person: Nancy Hirshberg

Phone: (603) 437-4040 x270

Fax: (603) 437-7594

E-mail: N/A

EIP's key features.

- Use of covenants to assure Industrial Ecology is model for the development.
- Adherence to Vision Statement.
- Eco-Auditing system to evaluate performance.

What constitutes success?

- Park tenants
- Jobs (500-2000)
- Increase community's tax base

- Positive Economic Impact as measured by independent study.

EIP linkages.

- Use of Covenants and Eco-Performance Standards
- Design guidelines being developed
- Active citizen participation processes
- Use of Advisory Board

Recruiting process.

- We have a committee developing a target industry strategy. This includes working with Businesses for Social Responsibility (BSR), local businesses and Realtors and an active multimedia promotion campaign.
- Existing Anchor tenants who will promote the park to like-minded corporations.

Resources available.

Town of Londonderry owns the land. Stonyfield Farms Inc. and Londonderry provide staff and seed money. Advisory Board includes EPA Region I, NH Charitable Foundation, MIT; NH Public Health; the Business Environment Network; UNH College of Life Science and Agriculture's Sustainable Living Core Group; the Nature Conservancy, Businesses Social Responsibility and Area Citizens.

Strategy to continue progressing.

- Complete covenants and organizational structure
- Public Hearing for Town Council to ratify above
- Begin marketing

What is missing?

Model covenants, screening procedures for tenants, targeting, environmental performance standards all would be useful. Ownership models, lease, incubators, would all be useful.

Goals for the upcoming workshop.

Input from colleagues and other models.

15. TRENTON ECO-INDUSTRIAL COMPLEX

Trenton, NJ

Address: 319 E. State Street, Trenton, NJ 08608

Managing Entity: City of Trenton, Division of Economic Development

Contact Person's Name: Jill Hallie Edwards

Phone: (609) 989-3509

Fax: (609) 989-4243

E-mail: trentbf@ibjersey.com

Alternate Contact Person: Matt Polsky, NJ Department of Environmental Protection

Phone: (609) 777-0319

EIP's key features.

- Trenton's EIP will not necessarily be a physical place, but may be a network of businesses; firms won't need to be located next door to each other to participate; there will be a management structure to assist businesses with these linkages, matchmaking, and other technical assistance.
- Another key feature is the diversity of our Eco-Industrial Round table and the process it has undertaken to develop an EIP. The Round table is a multi-stakeholder steering committee comprised of representatives from government, business, non-profit and educational institutions.

What constitutes success?

- Success will be creating new jobs for our residents, increasing tax ratabilities, utilizing our Brownfields sites, creating value-added products that generate additional money in our local economy.
- Success will be more easily measured in terms of economic development, but at the same time we will improve the environment through less waste, less pollution and cleaner industries being recruited. We also hope to position Trenton as a "green" city.
- Success may initially be determined by expressions of interest from developers and attention by the media for this unique form of industrial development.

EIP linkages.

- Bruce Herrick, Ph.D., a Round table member, prepared a working paper that outlines the Round table's progress to date and its plan of action. The report also lists the potential linkages that the Round table had brainstormed.
- We hired Cornell University Work and Environment Initiative to conduct feasibility study and baseline assessment. We will survey the businesses that already exist in the region and their processes, inputs and outputs. We will then determine what other businesses can build off of those.

Recruiting process.

- We have produced one brochure on the project and recently sent out our first news release (our last Round table meeting was covered by a TV local Station and newspaper). We will continue a public relations campaign to attract business and developer's attention to the project.

Resources available.

- City of Trenton and NJ DEP - Contributing in-kind staff time to coordinate Round table activities. Also covers postage, photocopying and printing.
- DEP contributed \$2,400 for preliminary Report.
- New Jersey Urban Enterprise Zone Assistance Fund - \$25,000 Grant

- United States Economic Development Administration - \$25,000 Technical Assistance Grant.
- Application to United States Environmental Protection Agency - \$100,000 Sustainable Development Challenge Grant.

Strategy to continue progressing.

- Round table has outlined a time line in its first work paper.
- Must complete baseline study.
- Must secure additional \$50,000 to continue study.
- Must continue to increase the business and development community's interest as the planning proceeds.
- Must secure funding to set up management structure and hire manager(s).
- Must recruit businesses and work with existing business to development networks.

What is missing?

- Interim and periodic successes to keep the Round table going.
- An input/output analysis of existing industrial processes and potential new recruits.
- Determine the best "mix" for Trenton that will build off of our competitive advantages.
- Evaluation method to determine success and/or failure.

Goals for the upcoming workshop.

- Create network of EIPs for information exchange and to share leads on potential business opportunities.
- Learn what obstacles others are facing and how they are dealing with them.
- Find out what resources there are to help (grants, technical assistance).
- Learn how to identify potential businesses and recruit them.
- Learn about management structures and how to pay for EIP management.
- Learn What Project XL can do for us.

VI. Break Out Session Reports

During the first set of break out sessions, workshop participants divided into roughly equal groups to brainstorm and share ideas about the following topics:

Forming an Industrial Ecosystem
 Recruiting New Firms and Retaining Existing Firms
 Governance and Management Structures
 Strategies for Successful Community Involvement Finance
 Setting and Maintaining Performance Standards

The ideas were recorded on flip charts and later transcribed to be included on the following pages.

(1 of 1)

Crafting Industrial Ecosystems

Key Activities and Critical Stages:

1. Community involvement and vision
2. Park as a "relationship", not a piece of real estate
3. Understand materials and energy flows
4. Agile infrastructure
5. Communication and learning
6. Economics and economic incentive
7. Accessibility of information to community and industries
8. Reduce and address risk
9. Expedite implementation
10. Confidentiality/confidence

(1 of 2)

Recruiting New Firms and Retaining Existing Companies

Know Product:

1. Site characteristics
2. Location
3. Access to capital
4. Infrastructure
5. Community participation
6. Employment & education & training
7. Regulations: flexible re*
8. Speed of permitting
9. Networks (waste, business, vendor)
10. Competitive edge
11. Cost savings
12. Political will/synchronized

(2 of 2)

Recruitment Tools:

1. Incentives/wage subsidies
2. Links to agencies and utilities
3. Technical transfer and spin off opportunities
4. Retention and expansion
5. Predictable sites (buildings, infrastructure)
6. Support systems ("labs", universities)
7. Competition/community profiles
8. Patience/diligence
9. Employment mix
10. Learning information, experience, and feedback
11. Community fit
12. Business retention
 - Familiarity
 - Links

(1 of 9)

Governance and Management Structures

1. Ownership of Structure
2. Government (state, local, county)
3. Industrial development authority
 - Public/private partnership
4. Private developer
5. Non-profit organization/developer
 - Community development corporation
 - 501 (c) (3)
 - Chamber of Commerce
6. Co-op/condo. of private owners
7. Combination

(2 of 9)

Structure:

1. Regional approach - network linking businesses in region
 - Not co-located
2. Physical site
 - Incorporates businesses in neighborhood around the site
 - Sort of co-located
3. Small discreet area- **Single site co-located**
 - **3.5-10 acres / 80 acres**

(3 of 9)

Financing Management

1. Association fee
2. Fee for service (e.g. waste exchange)
3. Leases
4. Income from hiring management own and operate EIP, regional utility or other profit-making enterprise (i.e. nursery, food, fish product)
5. Barter system
6. Credits (Clean Air Act, development rights)
7. Royalties from new developments/outcomes of co-op
8. Foundation grants
9. Stock options/shares

(4 of 9)

1. Impact fees for infrastructure/rebate for improved performance
 - Must be region/state-wide
2. Tax/T.I.F./dedicated portion of sales tax
3. Interest from investments
 - Endowment/trust fund
4. Franchise
 - EIP management expertise
 - Vendor matching

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| <ul style="list-style-type: none"> - Proprietary computer software <ol style="list-style-type: none"> 5. Government grants 6. Miracle * 7. Donations (if management is 501C (3)) 8. Community Reinvestment Act money 9. In-kind contributions |
| <p>(5 of 9)</p> <p>Management of EIP Outline</p> <ol style="list-style-type: none"> 1. Structure of park (S) 2. Functions and benefits (F)* <ul style="list-style-type: none"> - Manager/staff - Tenant association/board 3. Management of structure (M) 4. Financing (FM) |
| <p>(6 of 9)</p> <p>Functions</p> <ol style="list-style-type: none"> 1. Qualify prospective tenants 2. Tenant selection <ul style="list-style-type: none"> - Matchmaking - Meet criteria/performance standards 3. Marketing/advertising/public relations 4. Recruitment 5. By-Laws/governance structure/rules 6. Support inter-firm collaboration 7. Negotiate with regulators 8. Manage/maintain infrastructure and common property (landscaping, signage) 9. Managing common facilities <ul style="list-style-type: none"> - Conference center - Day care - Cafeteria - Recreation facilities/trails - Recycling center - Computer center - Civic space/event space (focal point for community) |
| <p>(7 of 9)</p> <ol style="list-style-type: none"> 1. Enforce standards of EIP 2. Monitor energy/material flows <ul style="list-style-type: none"> - Provide feedback for continual improvement 3. Emergency response system operate (fire, spills, explosions) 4. Bulk purchasing/co-op procurement (services and goods) 5. Handle tenant leases 6. Hold portion of intellectual proerty rights (patents, trademarks) <ul style="list-style-type: none"> - Related to industrial ecology/co-location (not within business) 7. Permit holder/flexibility (issues of trust, opt out, provisions)* <ul style="list-style-type: none"> - Collaborative permitting/hold credits (air quality, energy savings) |

| |
|---|
| 8. Group insurance policy (health, liability) - Like in incubator |
| (8 of 9) 1. Education and training Technical support/library of information 2. Transportation management 3. Workers' housing/communal opportunities/retail on-site 4. Community outreach (newsletter, World Wide Web site) 5. Links between community and EIP 6. Tourist/civic attraction/tours of EIP 7. Grant writing 8. Facilitating partnerships - University/college/high school - Interns - Research 9. Liaison with board of directors/Round table/other advisers 10. Encourage other Green initiatives |
| (9 of 9) 1. Security 2. Develop financing tools - Gap financing - Grants - Guaranteed loans/letters of credit - Credit enhancements - Single letter of credit for whole park - Working credit 3. Shared research and development 4. Create new technologies |

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| (1 of 10) D. Strategies for Successful Community Involvement |
| 1. Community Involvement is Key, Especially for Successful Recruitment/Support - Visioning as one of the first steps in planning - Design charrettes as one method - "Design" community uses these regularly - Future search conferences - Surveys |
| (2 of 10) 1. Tie the vision to the actions people pledge to take 2. Remember to show elected officials that the numbers of people who support your project are also votes 3. Democracy to economic sector - That is what we are trying to do |

| |
|--|
| <ul style="list-style-type: none"> - How can we show that it will help companies 4. Key data can help focus on problems, opportunities and expand people's horizons and contexts 5. Thank the community first <ul style="list-style-type: none"> - Give them the credit for success |
| <p>(3 of 10)</p> <p>When People Do Not Come, It Is Our Communication Efforts That Need Fixing</p> <p>It is our responsibility to make our agenda compelling</p> <ul style="list-style-type: none"> - The choir will always show - we need to accept that our agenda will change when the non-choir shows up - Maintain our values, but be open to other views |
| <p>(4 of 10)</p> <ul style="list-style-type: none"> 1. Key is initial seed funding <ul style="list-style-type: none"> - Needs to be leveraged within the community - Federal funding needs to be flexible enough to apply to these broader projects |
| <p>(5 of 10)</p> <ul style="list-style-type: none"> 1. Equity <ul style="list-style-type: none"> - Benefits should include opportunities for all - People as ultimate resource of the community (outreach link) (6 OF 10) 2. Find/orchestrate small successes everyone can be proud of <ul style="list-style-type: none"> - Agree to a measure of success that can prove progress 3. Commitment and long term framework necessary so people do not cop out and pit economy/jobs against environment (i.e. dirty jobs are okay because they are jobs) <ul style="list-style-type: none"> - In the long run this is a losing proposition |
| <p>Note: (6 of 10) missing</p> |
| <p>(7 of 10)</p> <ul style="list-style-type: none"> 1. If EIP market is communities in need - many disenfranchised (dumped-on) communities 2. Remember youth - future leaders 3. Find innovative ways to get people to connect and create community (murals, art, stories) <ul style="list-style-type: none"> - Tie it to actions, meeting, issues that move the project 4. Put up everyone's ideas first, then move to prioritizing in a group process 5. Identify experts who are from the community to answer questions |
| <p>(8 OF 10)</p> <ul style="list-style-type: none"> 1. Realistic time lines/check-in times, closure-process balance |

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| <ol style="list-style-type: none"> 2. Involvement is simply good organizing (call, talk, cajole) 3. Language is a powerful ally or enemy <ul style="list-style-type: none"> - Depends on if you use the right words to convey information and connect the project to people's needs/values/concerns 4. Develop local "champions" for your work who add legitimacy 5. Make it easy to get involved <ul style="list-style-type: none"> - Not always meetings - time |
| <p>(9 OF 10) Inclusion/Outreach</p> <ol style="list-style-type: none"> 1. Open to all 2. Ongoing process/follow-up 3. Identify partners/research 4. Target special outreach to those who rarely come 5. Ask people for their views before you launch to encourage buy-in <ul style="list-style-type: none"> - Have others join in as those with outreach responsibilities 6. Give people a stake in your success/ownership |
| <p>(10 of 10) Challenges:</p> <ol style="list-style-type: none"> 1. How do you overcome business sector skepticism? 2. How can you neutralize the impact of naysayers if they can not get them on-board? <ul style="list-style-type: none"> - Try all inclusionary strategies first 3. How can we clearly articulate the benefits of community involvement? <ul style="list-style-type: none"> - To business - To politicians |

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| <p>(1 of 7) E. Setting and Maintaining Performance Standards</p> <p>Performance Measures:</p> <ol style="list-style-type: none"> 1. Economic 2. Environmental 3. Quality of life <ul style="list-style-type: none"> - Not focused on Command and Control (C&C;) - Going beyond C&C; is challenging - Reach production managers, community - Need to think about how to accomplish |
| <p>(2 of 7) How to Balance Credible Reporting with Company Reporting? How to Build in Constituencies?</p> |

1. New approach - report for performance may reduce burden on companies
2. Need incentives - economic (cost of material waste)
 - Emission/environmental measures
3. Willingness to be flexible linked to economic condition
4. What criteria to access park?
 - Is a 50% reduction in emissions adequate?
 - Is 50% window dressing
5. To Answer: Is park zero-emissions or is facility zero-emissions (symbiosis matters)?
6. Community needs consistency and commitment to original terms of park

How to Balance Credible Reporting with Company Reporting?
How to Build in Constituencies?

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(3 of 7)

1. Performance linked to continuous improvement
2. Given - meet regulations
3. Beyond compliance - company discretion
4. Only criteria
 - Continuous improvement
 - Self managed
 - Inspect audits
5. Need to start with community-based goals and standards
6. Ground rules needed on boundaries of community
 - Changed condition might change community boundaries
7. What are standards?
8. Community buy-in

(4 of 7)

1. Trade-off
 - Too high of a hurdle for entry to EIP, may drive off prospective tenants
2. Agreement should balance results/burden
3. Perhaps - different tiered parks (e.g. Cape Charles - Level I, Level II)

4. Perhaps - permit at park level
 - Park officer/internal policing
5. Differentiate what is possible today and what is possible tomorrow
 - We are raising high expectations, but may not be able to deliver
6. Incentives
 - Decrease the cost
 - Increase the revenue
7. EIP - ISO certified

(5 of 7)

What Next?

1. Government
 - Coordinate program
 - Provide resources proportional to business commitment to beyond compliance
 - Audit compliance privilege issues need to be worked out
 - Assurance up-front
 - Superfund liability - "fear of" is barrier
 - ISO audits face similar issues
2. Define performance
3. Expectations for trade-offs
4. Who defines: stakeholders

(6 of 7)

1. Technical assistance to communities to set performance (e.g. ICMA)
2. Consider mitigation banking w/n park emissions trading *
3. Explore link between environment regulations and zoning
4. Voluntary programs need structure to serve business self interest
5. Measures - indexed measures
6. Figure out how to integrate ISO/14000, environmental management, with environmental regulations - forum
7. Maximize true environmental costs
8. Minimize transactions costs
9. Tax incentive fix
10. Tier 1, 2, 3 parks

(7 of 7)

1. Obstacle
 - Planning/zoning do not always have resources to monitor and track

VII. Critical Issues and Next Steps Breakout Sessions

During the second set of break out sessions, workshop participants were again divided into roughly equal groups to brainstorm critical questions and next steps. Each group was given the same charge. By assigning the same question to multiple break out groups, it was possible to identify common questions and recommendations. The EIP working group used this approach to create recommendations found in the executive summary.

The ideas were recorded on flip charts and later transcribed to be included on the following pages.

(1 of 2)

Group 1 – Session 2

Critical Issues

1. Relation to service economy
2. Need for umbrella to follow-up on PCSD
3. Green infrastructure
4. How to broaden the discipline, base concept of sustainable development in curriculum
5. What should the Federal vote be
6. Real estate issues
7. Public outreach and information at local level
8. Training for local residents
9. Defining and integrating baseline
10. Hands on technical resources
11. Political will (long term)
12. Propagation
13. Community integration into larger system

(2 of 2)

Needs

1. Buildings
2. Credit Union
3. Long range plan
4. Resources at Federal level to examine market
5. Public education/educate public
6. Federal sources for startup
7. Create strategic advantages
 - Lower transactional/regulatory costs

(1 of 3)

Group 3 – Session 2

What's Next

1. Collaborative interagency approach to federal funding
 - Industrial ecology international agriculture trust fund exists*
 - Need at state level also (e.g. VOCIT) *
2. Pool resources
 - Create entity that can deliver resources as well as concepts for EIP development support
3. Develop protocol for defining input/output
4. Have the group at this workshop stay together as group
 - Ongoing network to share what works/what did not
5. "Best practices" CD ROM
6. Articulate attainable goals and assessment of return on investment
7. Set mechanisms in place to measure progress/success
 - Include social, economic, environmental
8. Measure benefit to the local community
9. Set up vehicle to help community evaluate potential/make smart decisions
10. Must include industry in the process
11. Get everyone at the table who should be at the table
12. Education
13. Create regional centers for EIP development
14. Must back intentions with appropriate level of funding
15. Also, decrease funding for non-sustainable development (penalties/disincentives)
16. More examples, demonstrate successes
17. Business extension service (SBDC's?)
18. Create and highlight examples of business linkages
19. Promote linkages while solving businesses' problems and meeting needs

(2 of 3)

Issues/Needs

1. Funding
 - Identify sources
 - A. Federal - need list (who? what?)
 - Many sources
 - Many agencies
2. Eco-industrial development
 - Get higher on national agenda
3. E.G.P.

(3 of 3)

1. EDA
 - Fund lots of industrial parks, but no incentives for eco-industrial parks
2. How would EDA or others distinguish eco-industrial parks from others
3. What are the criteria?
4. Categories of EIPs
 - Tier 1

- Tier 2
- Tier 3
- 5. Get tenants looking for parks
- 6. Improve economic, environment, and equity/able performance *
- 7. Set criteria loosely
- 8. Skill transfer from companies/jobs as they are created
- 9. Keep the momentum of job development
- 10. Group incentives
 - Groups of companies, not just individual
- 11. Waste to raw materials groups
- 12. Industry groups
- 13. Example - Industrial by-products task force in Virginia (Virginia Center for Innovative Technology)
- 14. Need database (characteristics of industries)
- 15. What are the potential interactions
 - Brownsville - Input/Output Model
- 16. Potential linkages
- 17. Who is moving the sustainable development agenda at the local and regional level
 - Northwest Council
- 18. Joint Center for Sustainable Development * NACO/ICMA
- 19. Communicate what is happening (CD ROM)
- 20. Access to information
- 21. Emphasize site specific
- 22. Ground action/policy on good business sense
- 23. Profit motive must be driver
- 24. Encourage access to local markets
- 25. "UDAG" approach to funding EIP's
- 26. Re-invent government approach to funding

(1 of 2)

Group 4 – Session 2

Needs

- 1. Money
- 2. Political support
- 3. Community Involvement
- 4. Early Success and Progress
- 5. Education of all players
- 6. Funding agencies/lenders
 - Federal Government/Congress/Policy Makers
 - State/Federal Agencies
 - Foundations
 - Industries
 - National Associations
 - Educators
- 7. Streamline Federal/State Involvement
 - Interagency

- One-stop Shopping
- 8. Champions in High Places
 - Leadership
- 9. Prototype material/energy systems (ecosystems)
- 10. Develop "start up" Strategies
- 11. Socio-Economic Analysis (to determine impacts and gaps)
- 12. Protection of Intellectual Property
- 13. Partnerships
- 14. Establish time line/Milestones
- 15. Publish Resource Guides
- 16. Assist Businesses in Developing Strategic Business Plans
- 17. Clearinghouse/Network for Information
- 18. Flexibility
- 19. Material Input/Output of All Industries - Energy
- 20. Community Training Programs
- 21. Input from System's Engineers/Logisticians

(2 of 2)

Strategies

1. Create Association of EIPs (National
 - Address money, political support (e.g. All Needs)
 - One entity
 - One stop shop for financial support and information
 - Clearinghouse and network functions
 - Non-profit based
 - A. Centralized nationally with local/community chapters
 - B. Memberships
 - C. Technical specialists
 - Interdisciplinary
2. Establish as a national goal to get EIPs as an agenda item for a Cabinet level meeting
3. Task major industry to champion cause -- go to industry group with concept to generate their interest/support
4. Determination of which entities are the best to progress the concept of EIP
 - Federal and State Government?
 - Private Sector and Industry?
 - Non-profit national association?
5. Develop template for community involvement
 - Workbook with resolutions
 - List of options
6. Community visioning process
 - Values
 - Commitment
 - Trust
7. Community ownership/equity

(1 of 5)

Group 5 – Session 2

Group 5 identified key recommendations for five of the six discussion areas.

- Governance and Management
 1. Private sector should take the lead in development of EIPs because of the profit potential and management requirements. Community based associations should offer advice and assist in the development of performance standards.
 2. Other ways of assisting in governance and management might include:
 - A. Executive loan programs
 - B. Involvement by financial services community

(2 OF 5)

- Performance Standards and Regulatory Flexibility
 1. Resource sharing of energy, and non-hazardous wastes is doable, however hazardous wastes area problematic because of regulatory and economic hurdles. Recommendation is that a new pilot project to test idea of regulatory relief to facilitate understanding of pollution prevention and hazardous waste exchanges. Ongoing efforts prior to this might include collecting data from current industries that operate in similar types of industries such as hazardous waste handlers.
 2. Because all EIPs do and will differ in approaches community must agree on performance goals as these will affect recruitment strategies.

(3 OF 5)

- Finance
 1. Develop a tool kit of how to finance these types of investments. Included in this packet should be a process for education of financial services and the community. Further, tool kit should demonstrate the safety of EIPs, Brownfields investments. If appropriate a quantitative economic study should be organized.

(4 OF 5)

- Recruitment
 1. Suggested programs to meet financial needs include an executive loan program for planning, starting up new businesses, and management. Further, incubator services can be used to provide guidance and support.

(5 OF 5)

- Industrial Ecosystems
 1. Communities have different concepts of what makes up their industrial ecosystems. A tool to develop links between energy/material flows in different sectors would be helpful. Strategies for developing an industrial ecosystem ranged from computer modeling possibilities to local interviewing to feasibility studies.

(1 of 4)
Group 6 – Session 2

Needs

1. Address diversity of projects including refined definitions
 - Eco-industrial development is not just EIPs
 - Communities can refine definitions
 - Definitions should be broad enough but assure that projects adhere to clearly articulated values
2. Articulation of how EIPs help private sector -- should be specific in outcomes.
3. Clear communication to targeted sector actors.
4. Community involvement and equity piece needs to be elevated.
5. Range of job levels from "high-tech" to entry level.
6. Partnerships, especially unlikely partners in projects (utility companies, transportation firms, etc.)
7. Address of the layers of governance and management issues for the diversity of eco-industrial development scenarios
8. Financing needs to be market based, not just a government program.

(2 OF 4)

Strategies

1. Public policy incentives that promote *well defined* EIPS.
 - Criteria for financing, zoning, regulations
 - Loan guarantees (i.e. housing)
 - Workforce training for underemployed, flex time
2. Public education so residents understand and can articulate shared community goals.
3. Community organizing
4. Community mission statements
5. Export opportunities to tap growing markets--global trade connections are complex
6. Visioning, charrettes, county meetings to solicit buy in, ideas, and common purpose
7. Constantly underscore that EIPs are free market-based enterprises.

(3 OF 4)

Strategies for Follow Up

1. Meetings with modular tracks to detail specifics and encourage collaboration
2. Discussion on criteria and real definition of EIPs or eco-industrial development
3. Focused discussion on the clear links between equity and our larger societal goals
4. Need groups' information summaries
5. Meet with national Business Incubators Association

(4 OF 4)

Next Steps

1. Create and find good "hubs" of information on these issues
2. Organized information on origins of funding but emphasize the replicability without federal dollars
3. Focus group of employers to get real world check
4. National waste exchange with state participation also.

VIII. Eco-Industrial Development Resources

At the Workshop, various resources were mentioned by speakers and during small group sessions. The number and types of resources on industrial ecology, design for the environment, eco-industrial parks, and eco-industrial development is rapidly emerging. The resources presented below are not an exhaustive list, but intended to give the reader a launching point for finding more information on this emerging field of thought and activity.

Books, Journals, Papers

This list includes a number of books, journals, and papers on eco-industrial development and related topics. Where it may be difficult to obtain materials, a contact reference has been included.

Allenby, Braden and Deanna Richards (eds). 1994. *The Greening of Industrial Ecosystems*. Washington, D.C.: National Academy Press.

Bowes, David. 1996. *Creating Globally Competitive Communities*. This special section of *Industry Week* is available from David Bowes at Oak Leaf Associates (202) 833-2451 or by e-mail: dbowes@aol.com.

Cohen-Rosenthal, Ed, Mike Palumbo, and Bruce Fabens. 1995. *The Fairfield Ecological Industrial Park, Baseline Study*. This document discusses baseline information about Baltimore's EIP project. To obtain copies of the report, contact the Work and Environment Initiative (607) 254-5089.

Cohen-Rosenthal, Ed., Tad McGalliard, Michelle Bell. 1996. "Designing Eco-Industrial Parks." This paper to be published in the Spring edition of the United Nation's journal, *Industry and the Environment*, is available from the Work and Environment Initiative, (607) 254-5089.

Cote, Raymond, Robert Ellison, Jill Grant, Jeremy Hall, Peter Klynstra, Michael Martin, and Peter Wade. 1995. *Designing and Operating Industrial Parks as Ecosystems*. This report examines industrial parks, the Burnside Eco-Industrial Park project, and discusses a set of principles for designing and operating industrial parks. For more information, contact Professor Raymond Cote at Dalhousie University, (902) 494-3632.

"The Liberation of the Environment. *Daedalus*, Journal of the American Academy of Arts and Sciences. Summer 1996. This special issue contains articles on industrial ecology and design for the environment.

Dalhousie University. 1995. *The Industrial Park as an Ecosystem: Updated Bibliography*. This document contains a number of resources and uses an annotated bibliography format. For more information, contact Professor Raymond Cote at Dalhousie University, (902) 494-3632.

E.D. Hovee and Company, O'Brien and Company, and Shapiro and Associates, Inc. 1995. Skagit County Environmental Industrial Park Feasibility and Planning Study. This report discusses the feasibility of EIP development in Skagit County. For more information contact Economic Development Association of Skagit County, (360) 336-6114.

Ehrenfeld, J. R. and Nicholas Gertler (Forthcoming) "Industrial Ecology in Practice: The Evolution of Interdependence at Kalundborg," *Journal of Industrial Ecology*, Vol. 1, No. 1.

Gertler, Nicholas and John R. Ehrenfeld. 1996. "A Down-to-Earth Approach to Clean Production." *Technology Review*, February/March.

Gertler, Nicholas. 1995. "Industrial Ecosystems: Developing Sustainable Industrial Structures." Master's Thesis, MIT.

Graedal, T.E. and B.R. Allenby. 1995. *Industrial Ecology*. Englewood Cliffs, N.J.: Prentice Hall.

Herrick, Bruce. 1995. "Eco-Industrial Round table: An Industrial Park in Trenton, Progress to Date and Plan of Action." *Industrial Ecology Associates*. This report focuses on the activities of Trenton's Eco-Industrial Round table. For more information on this effort, contact Jill Hallie Edwards, Trenton Economic Development, (609) 989-3509.

Lau, Sabrina. 1996. *Investigating Eco-Industrial Park Development*. This report is based on an informal survey of several EIP sites. For more information contact the Green Institute, (612) 874-1148.

Lowe, Ernest and John L. Warren. 1996. *The Source of Value: An Executive Briefing and Source Book on Industrial Ecology*. For information on obtaining a copy of this document, search the following World Wide Web site www.indigodev.com.

Lowe, Ernest., Stephen R. Morrow, and Douglas Holmes. 1996. *Field book for Development of an Eco-Industrial Park*. For more information, search the following World Wide Web site www.indigodev.com.

Martin, Sheila, Robert A. Cushman, Keith A. Weitz, Aarti Sharma, and Richard Lindrooth. 1996. *Eco-Industrial Parks: A Case Study and Analysis of Economic, Environmental, Technical and Regulatory Issues*. For more information, contact Sheila Martin at the Research Triangle Institute (919) 541-5847.

President's Council on Sustainable Development (PCSD) 1996. *Sustainable America*. This report represents the findings from over three years of work by the PCSD. To obtain copies, contact the PCSD (800) 363-3732.

President's Council on Sustainable Development (PCSD). 1996. *Eco-Efficiency Task Force Report*. This document contains information on eco-efficiency and includes sections on the four PCSD eco-industrial park demonstration sites. To obtain copies, contact the PCSD (800) 363-3732.

Salvesen, David. 1996. "Making Industrial Parks Sustainable." *Urban Land* (February), pp. 29-32.

Van Der Ryn, Sim and Stuart Cowan. 1996. *Ecological Design*. Washington, D.C.: Island Press.

Organizations

A number of organizations can provide valuable information on eco-industrial development including EIPs.

Government

The President's Council on Sustainable Development. 730 Jackson Place, NW, Washington, DC, 20503. Telephone: (202) 408-5296. Fax: (202) 408-1655.

U.S. Department of Commerce, National Oceanic and Atmospheric Administration, Office of Sustainable Development and Intergovernmental Affairs, 1401 Constitution Avenue, NW, Room 5222, Washington, D.C., 20230. Telephone: (202) 482-4290. Fax: (202) 482-2663. Contacts: John K. Bullard.

U.S. Environmental Protection Agency, Urban and Economic Development Division. 401 M Street, SW, Washington, DC 20460. Contact: Suzanne Giannini-Spohn. Telephone: (202) 260-7568. Fax: (202) 260-0174. E-mail: giannini-spohn.suzanne@epamail.epa.gov. www.sustainable.org/SGN/sgn_index.html.

U.S. Department of Energy, Center of Excellence for Sustainable Development, Golden Field Office, 1617 Cole Boulevard, Golden, Colorado, 80401-3393. Telephone: (303) 275-4714. Fax: (303) 275-4788. E-mail: Kotasg@tcplink.nrel.gov. Contact: Jerry Kotas.

Other Organizations

Bechtel Corporation R & D. P.O. Box 193965, San Francisco, CA 94119. Telephone: (415) 768-4261. Fax: (415) 768-2743. E-mail: dacobb@bechtel.com. Contact: David Cobb.

The Business Ecology Network. P.O. Box 29, Shady Side, Maryland, 20764. Telephone: (410) 867-3596. Fax: (410) 867-7956. E-mail: abe@naturaledge.org. World Wide Web URL: naturaledge.org. Contacts: Joe Abe, Greg Freeman, Patricia Dempsey.

Cornell University, Center for the Environment, Work and Environment Initiative. 105 Rice Hall, Ithaca, NY 14853. Telephone: (607) 254-5089. Fax: (607) 255-0238. E-mail: ec23@cornell.edu. World Wide Web URL: www.cfe.cornell.edu. Contacts: Ed-Cohe n Rosenthal, Bruce Fabens, Tad McGalliard.

Dalhousie University, School for Resource and Environmental Studies, Halifax, Nova Scotia, Canada B3J 1B9, (902) 494-3632, Fax (902) 494-3728. Contact: Raymond Cote.

The Green Institute. 1433 E. Franklin Avenue, Suite 7A, Minneapolis, Minnesota, 55404. Telephone: (612) 874-1148. Fax: (612) 874-6470. Contacts: Michael Krause, Sabrina Lau.

Indigo Development. 6423 Oakwood Drive, Oakland, California, 94611. Fax: (510) 339-9361. E-mail: elowe@indigodev.com. World Wide Web URL: www.indigodev.com. Contact: Ernest Lowe.

Lawrence Livermore National Laboratory. Industrial Ecology Center, 7000 East Ave. Livermore, CA, 94551. Contacts. Jill Watz, watz1@llnl.gov: (510) 424-4811. Karen Blades; blades1@llnl.gov; (510) 422-4594

Massachusetts Institute of Technology, Technology, Business and Environment Program, Center for Technology, Policy, and Industrial Development, 77 Massachusetts Avenue, MIT Building E40-241, Cambridge, MA, 02139-4307. Telephone: (617) 253-1694 Fax: (617) 253-7140 Contact: John R. Ehrenfeld, Director. E-mail jehren@mit.edu. TBE Internet Homepage WWW URL: <http://web.mit.edu/ctpid/www/tbe>

Oak Ridge National Laboratory, Center for Global Environmental Studies. P.O. Box 2008, Oak Ridge, Tennessee, 37831-6250, Telephone: (423) 576-7785. Fax: (423) 576-9977. Contacts: Michael P. Farrell.

Research Triangle Institute, Center for Economics Research, 3040 Cornwallis Road, Research Triangle Park, North Carolina, 27709. Telephone: (919) 541-5847. World Wide Web URL: www.rti.org. Contact: Sheila Martin.

University of Tennessee, Center for Clean Products and Clean Technologies. 600 Henley Street, Suite 311, Knoxville, Tennessee, 37996. Telephone: (423) 974-8979. Fax: (423) 974-1838. Contact: Gary Davis.

U.S. Facilities Management Inc. P.O. Box 2738, Plattsburgh, New York, 12901. Telephone: (518) 566-6210. Fax: (518) 561-2422. Contact: Bruce Steadman.

IX. List of Attendees

A. Eco-Industrial Park Communities

Baltimore, MD/Fairfield Ecological Industrial Park

Michael J. Palumbo
Baltimore Development Corporation
36 S. Charles Street, 16th Floor
Baltimore, MD 21201
(410) 837-9310 x341, Fax (410) 547-7211
Email: MJP111@aol.com

Larisa Salamacha
Baltimore Development Corporation
(410) 837-9310 x340

Brownsville, TX

David A. Cobb
Bechtel Corporation R&D;
P.O. Box 193965
San Francisco, CA 94119
(415) 768-4261, Fax (415) 768-6663
Email: dacobb@bechtel.com

Michel A. Thomet
Bechtel Civil Company
50 Beale Street, P.O. Box 193965
San Francisco, CA 94119-3965
(415) 768-8521, Fax (415) 768-2852
Email: mthomet@bechtel.com

Rick Luna
Brownsville Economic Development Council
1205 N. Expressway

Brownsville, TX 78520
(210) 541-1183, Fax (210) 546-3938
Email: BroEdc@aol.com

Jackie Lockett
City Commissioner, City of Brownsville
President, Brownsville Information & Solutions Network
143 E. Price Road
Brownsville, TX 78521
(210) 546-1161

Cindy Wall
Regional Director
Texas Manufacturing Assistance Center
The Texas A&M; University System
301 Tarrow, Suite 119
College Station, TX 77843-8000

Burlington, VT

Mayor Peter Clavelle
City of Burlington, Room 34, City Hall
Burlington, VT 05401
(802) 865-7272, Fax (802) 865-7024
Email: clavelle@vbimail.champlain.edu

Bruce Seifer, Assistant Director, Community and
Economic Development Office,
City of Burlington, City Hall
Burlington, VT 05401
(802) 865-7179, Fax (802) 865-7024

Judith Bell Harris, Consultant,
Burlington Electric Department
Rural Route 1, Box 1610
Lincoln, VT 05443
(802) 453-6384, fax (802) 453-3628

Burnside Industrial Park /Halifax, Nova Scotia

Wayne Barchard, Environment Canada
5th Floor, 45 Aldemey Drive
Dartmouth, Nova Scotia B2V 2NG
(902) 426-4695, Fax (902) 426-8373
Email: barchardw@cpdar.am.doe.ca

Cape Charles/Northampton County, VA

Timothy E. Hayes, Director
Sustainable Economic Development
Northampton County Board of Supervisors
P.O. Box 538
Eastville, VA 23347

(757) 678-0477, Fax (757) 678-0483
Email: northampton@esva.net

Chattanooga, TN

David Daugherty
The Volunteer Site
ICI Americas, Inc.
6703 Bonny Oaks Drive (mail: P.O. Box 22608)
Chattanooga, TN 37422-2608
(423) 855-7253, fax (423) 855-7270

Civano Eco-Industrial Park /Tucson, AZ

Tres English, Tucson Environmental Council
129 S. Irving
Tucson, AZ 85711
(520) 881-8712, Phone and Fax

East Shore Eco-Industrial Park Project/San Francisco Bay

Ernest Lowe
Indigo Development
6423 Oakwood Drive
Oakland, CA 94611
(510) 339-1090, Fax (510) 339-9361
Email: elowe@indigodev.com

The Green Institute/ Minneapolis, MN

Michael Krause / Sabrina Lau
The Green Institute
1433 E. Franklin Avenue, Suite 7A
Minneapolis, MN 55404
(612) 874-1148, Fax (612) 874-6470

Plattsburgh Eco-Industrial Park

Mark L. Barie, CEO
Plattsburgh Airbase Redevelopment Corp.
426 US Oval, Suite 1000
Plattsburgh, NY 12903
(518) 561-0232, Fax (518) 561-0686

R. Bruce Steadman
U.S. Facilities Management Inc.
P.O. Box 2738
Plattsburgh, NY 12901
(518) 566-6210, Fax (518) 561-2422

Raymond Green Industrial Park

Rebecca Chaffee, City Engineer
City of Raymond
230 Second Street
Raymond, WA 98577
(360) 942-3451, Fax (360) 942-5616

Jim Lowery
Pacific County Economic Development Council
408 Second Street
Raymond, WA 98577
(360) 942-3629, Fax (360) 942-3688

Lorraine Wrona
City of Raymond
230 Second Street
Raymond, WA 98577
(360) 942-3451, Fax (360) 942-5616

Jim Neva
Port of Willapa Harbor
1725 Ocean Avenue
Raymond, WA 98577
(360) 942-3422, Fax (360) 942-5865

**Shady Side Eco-Business Park and
Community Development Center / Shady Side, MD**

Joe Abe
Business Ecology Network
P.O. Box 29
Shady Side, MD 20764
(410) 867-3596, Fax (410) 867-7956
Email: abe@naturaledge.org

Patricia Dempsey
Business Ecology Network
P.O. Box 29
Shady Side, MD 20764
(410) 867-3596, Fax (410) 867-7956

Gregg Freeman
Business Ecology Network
2907 Winters Chase
Annapolis, MD 20764
(410) 266-3216, Fax (410) 266-8950
Email: eloggie@aol.com

Skagit County Eco-Industrial Park

Kevin Morse
Economic Development Association of Skagit County
P.O. Box 40
Mount Vernon, WA 98273

(360) 336-6114, Fax (360) 336-6116
Email: eip@edasc.org

Don Wick
Economic Development Association of Skagit County
P.O. Box 40
Mount Vernon, WA 98273
(360) 336-6114, Fax (360) 336-6116
Email: eip@edasc.org

Stonyfield Farm/Londonderry NH Eco-Industrial Park

Peter C. Lowitt
Director, Planning and Economic Development
Town of Londonderry
50 Nashua Road, Suite 100
Londonderry, NH 03053
(603) 432-1134, Fax (603) 432-1128
Email: 103504.1403@compuserve.com

Nancy Hirshberg
Stonyfield Farm, Inc.
10 Burton Drive
Londonderry, NH 03053
(603) 437-4040, Fax (603) 437-7594

Fenn, Anne H.
U.S. Environmental Protection Agency/Boston
JFK Federal Building
Boston, MA 02203
(617) 565-3927, Fax (617) 565-4939
Email: Fenn.Anne@epamail.epa.gov

Trenton Eco-Industrial Roundtable/Trenton, NJ

Jill Hallie Edwards
City of Trenton, Division of Economic Development
319 E. State Street
Trenton, NJ 08608
(609) 989-3509, Fax (609) 989-4243

B. Other Attendees

Adesanya, Dr. B.A.
Environmental Justice Information Center
GIS Lab, Hampton University
27 W. Queensway, Suite 102
Hampton, VA 23669
(757) 728-3958, Fax (757) 728-9058
Email: Yemi@hamptonU.edu

Alvarez, Ramon
Environmental Defense Fund

44 East Avenue, Suite 304
Austin, TX 78701
(512) 478-5161, Fax (512) 478-8140
Email: alvarez@edf.org

Antonishek, Brian
Concurrent Technologies Corporation
1450 Scalp Avenue
Johnstown, PA 15904
(814) 269-2636, Fax (814) 269-2666
Email: atonis@corp.ctc.com

Bannon, Christopher
Council Member Cape Charles
9 Tazewell Avenue
Cape Charles, VA 23310
(757-331-2206

Barber, Neal J.
Virginia's River Country
P.O. Box 286
Saluda, VA 23149
(804) 758-2311, Fax (804) 758-3221

Beach, Tyrone L.
Senior Planner, Economic Adjustment Division
Economic Development Administration
U.S. Department of Commerce
The Curtis Center, Suite 140 South, Independence Square
Philadelphia, PA 19106
(215) 597-7883, Fax (215) 597-6669
Email: Tyrone L.Beach@plng@edaphi

Beckwith, Sidney A.
Port of Brownsville
Brownsville Navigation District
1000 Foust Road
Brownsville, TX 78521
(210) 831-4592, 1-800-378-5395, Fax (210) 831-5006

Bennett, David
HOH Associates (Master Planner for Baltimore EIP)
1505 Prince Street
Alexandria, VA 22314
(703) 683-8363, Fax (703) 549-2614

Bennett, Oliver H.
Northampton County Board of Supervisors
P.O. Box 66
Eastville, VA 23347
(804) 678-0440, Fax (804) 678-0483

Berge, Paul F.
Accomack-Northampton Planning District Commission
P.O. Box 417
Accomack, VA 23301
(757) 787-2936, Fax (757) 787-4221
Email: anpdc@esva.net

Bowes, David B.
The Manufacturing Institute
and Partners for Livable Communities
2555 Pennsylvania Avenue, NW, #618
Washington, DC 20037
(202) 833-2451, Fax (202) 833-2451
Email: dbbowes@aol.com

Briechele, Kendra J.
International City/County Management Association
777 North Capitol Street, NE, Suite 500
Washington, DC 20002-4201
(202) 962-3685, Fax (202) 962-3605
Email: kbriechele@icma.org

Bruckheimer, David
Espey, Huston & Associates
11838 Rock Landing Drive, Suite 250
Newport News, VA 23606
(757) 596-8267, Fax (757) 596-8660
Email: ehabalnd@erols.com

Bullard, John K.
Office of Sustainable Development and Intergovernmental Affairs
National Oceanic and Atmospheric Administration
U.S. Department of Commerce
1401 Constitution Avenue, Room 5222
Washington, DC 20230
(202) 482-3384, Fax (202) 482-2663
Email: John.K.Bullard@noaa.gov

Mr. W. Vincent Campbell
Bayshore Concrete, Inc.
P.O. Box 230
Cape Charles, VA 23310

Carter, Dr. Arthur T.
Chairman, Northampton County Board of Supervisors
P.O. Box 66
Eastville, VA 23347
(804) 678-0440, Fax (804) 678-0483

Chambers, John
McKenna & Cuneo
1900 K Street, NW
Washington, DC 20720

(202) 496-7698, Fax (202) 496-7756
Email: Jchamb@mckendc3.mhs.compuserve.com

Charlton, Campbell
Redfield Investments Ltd.
629 Tazewell Avenue
Cape Charles, VA 23310
(757) 331-8208, Fax (757) 331-4502

Chertow, Marian
Yale School of Forestry and Environmental Studies
205 Prospect Street
New Haven, CT 06511
(203) 432-6197, Fax (203) 432-5556
Email: chertow@yale.edu

Chubb, John
Citizens for a Better Eastern Shore
Box 882
Eastville, VA 23347
(757) 678-5469, Fax (757) 678-7216

Clarke, Donald L.
Town of Cape Charles
2 Plum Street
Cape Charles, VA 23310
(757) 331-3259, Fax (757) 331-4820

Cohen-Rosenthal, Ed
Work and Environment Initiative
Cornell University
105 Rice Hall
Ithaca, NY 14853
(607) 255-8160, Fax (607) 255-0238
Email: ec23@cornell.edu

De Lima, Daniel
BioProteus, Inc.
P.O. Box 73
Hacksneck, VA 23358
(804) 442-9543

Dillon-Ridgley, Dianne, Council Member
President's Council on Sustainable Development
1400 16th Street, NW, Suite 320
Washington, DC 20036
(202) 332-2200, Fax (202) 332-2302
Email: ddr@igc.apc.org

Dodd, Ray A.
Councilman, Town of Cape Charles
6 Tazewell Avenue

Cape Charles, VA 23310
(757) 331-3228

Egts, David D.
Concurrent Technologies Corporation
1450 Scalp Avenue
Johnstown, PA 15904
(814) 269-2631, Fax (814) 269-2666
Email: egts@corp.ctc.com

Eugster, Glenn
US EPA - CBPO
410 Severn Avenue, Suite 109
Annapolis, MD 21403
(410) 267-5722, Fax (410) 267-5777
Email: eugster.glen@epamail.epa.gov

Eustis, Christine E.
Office of Sustainable Development and Intergovernmental Affairs
National Oceanic and Atmospheric Administration
U.S. Department of Commerce
1401 Constitution Avenue, Room 5222
Washington, DC 20230
(202) 482-4290, Fax (202) 501-8066
Email: Christine.Eustis@noaa.gov

Evans, Bruce
Chairman, Joint I.D.A. of Northampton County
645 Tazewell Avenue
Cape Charles, VA 23310
(757) 331-4920, Fax (757) 331-4959

Fabens, Bruce
Cornell University
Work & Environment Initiative
105 Rice Hall
Ithaca, NY 14853
(607) 254-5466, Fax (607) 255-0238
Email: bcfab@cornell.edu

Flanagan, Susan
International City/County Management Association
777 North Capitol Street, NE, Suite 500
Washington, DC 20002-4201
(202) 962-3540, Fax (202) 962-3605
Email: sflanagan@icma.org

Friday, Paul M.
Concurrent Technologies Corporation
1450 Scalp Avenue
Johnstown, PA 15904
(814) 269-6426, Fax (814) 269-2620

Froehlich, Maryann
U.S. Environmental Protection Agency
401 M Street, SW
MC2121, Room 1005WT
Washington, DC 20460
(202) 260-4034, Fax (202) 260-0780
Email: froehlich.maryann@epamail.epa.gov

George, David
National Association of Counties
440 First Street, NW
Washington, DC 20001
(202) 942-4243, Fax (202) 737-0480
Email: dgeorge@naco.org

Giannini-Spohn, Suzanne, Ph.D.
Office of Policy, Planning and Evaluation
U.S. Environmental Protection Agency
401 M Street, SW
Washington, DC 20460
(202) 260-7568, Fax (202) 260-0174
Email: giannini-spohn.suzanne@epamail.epa.gov

Girouard, Daniel
Enterprise Zone Coordinator
State of Virginia
501 N. 2nd Street
Richmond, VA 23219-1321
(804) 371-7065, Fax (804) 371-7093

Harrell, Robert W. Jr.
Regional Director, Virginia's Center for Innovative Technology
Greenbrier Corporate Center
825 Greenbrier Circle, Suite 204
Chesapeake, VA 23320
(757) 523-2920, Fax (757) 523-6290
Email: bobby@cit.org

Harris, Thomas E.
County Administrator
Northampton County Board of Supervisors
P.O. Box 66
Eastville, VA 23347
(804) 678-0440, Fax (804) 678-0483

Hoag, John B. AIA, APA, ASLA
Hoag Associates
1104 Yale Avenue
St. Louis, MO 63117
(314) 647-5374, Fax (314) 647-0484

Hoffman, Frances
Institute for Responsible Management

46 Bayard Street, Suite 401
New Brunswick, NJ 08901
(908) 296-1960, Fax (908) 296-1972
Email: instrm@aol.com

Hooper, Theresa
3M
1101 15th Street, NW
Washington, DC 20005
(202) 331-6949, Fax (202) 331-2805
Email: tdhooper@mmm.com

Hoover, Eliza
Industrial Development Authority
123 Peach Street
Cape Charles, VA 23310
(804) 331-2709

Hubbard, Richard L.
Vice Chairman, Joint Industrial Development Authority of Northampton County
209 Mason Avenue
Cape Charles, VA 23310
(757) 331-2470, Fax (757) 331-2470 (must call first)

Johnson, Thomas
Espey, Huston & Associates
11838 Rock Landing Drive, Suite 250
Newport News, VA 23606
(757) 596-8267, Fax (757) 596-8660
Email: espey@erols.com

Jones, Owen Michael
Redfield Investments Ltd.
629 Tazewell Avenue
Cape Charles, VA 23310
(757) 331-8208, Fax (757) 331-4502

Knickmeyer, John, AIA
Burt Hill Koser Rittelmann Associates
1056 Thomas Jefferson Street, NW
Washington, DC 20007
(202) 333-2711, Fax (202) 333-3159

Kotas, Jerry
Senior Environmental Scientist
Golden Field Office
U.S. Department of Energy
1617 Cole Boulevard
Golden, CO 80401-3393
(303) 275-4714, Fax (303) 275-4788
Email: Kotasg@tcplink.nrel.gov

Leach, Philip J.
Executive Vice President
Atlantis Energy Systems, Inc.
5432 Bayside Road
Exmore, VA 23350
(804) 442-3509, Fax (804) 442-3755
Email: Solar Building @ esva.net

Levitt, David
Jager Management
1719 Delancey Place
Philadelphia, PA 19103
(215) 546-0175, Fax (215) 546-0175
Email: jdlevitt@aol.com

Linett, Robert A.
Science Applications International Corporation
1710 Goodridge Drive (MS 1-11)
McLean, VA 22102
(703) 917-7938, Fax (703) 903-1372
Email: bob-linett@cpqm.mail.saic.com

Mapp, Ms. M.E.
Northampton County Board of Supervisors
P.O. Box 66
Eastville, VA 23347
(804) 678-0440, Fax (804) 678-0483

Marquis-Lavoie, Suzanne
MAB/CIIS Graduate
2816 Strauss Terrace
Silver Spring, MD 20904
(301) 890-1788, Fax (301) 890-3951
Email: SuzMarquis@aol.com

Matsinger, Josie
U.S. Environmental Protection Agency, Region III
841 Chestnut Street
Philadelphia, PA 19107
(215) 566-3132, Fax (215) 566-3001
Email: matsinger.josie@epamail.epa.gov

Mauermann, Sue
Department of Ecology
State of Washington
P.O. Box 47775
Olympia, WA 98504-7775
(360) 407-6307, Fax (360) 407-6305
Email: SMAU461@ecy.wa.gov

McBroom, Judy
Camber Corporation
101 Donner Drive

Oak Ridge, TN 37830
(423) 483-7339, Fax (423) 483-7439
Email: jgmcbroom@camberva.com

McGalliard, Tad
Cornell University
Work & Environment Initiative
105 Rice Hall
Ithaca, NY 14853
(607) 254-5089, Fax (607) 255-0238
Email: tnm2@cornell.edu

McKay, Laura
Virginia Coastal Resources Management Program
629 East Main Street
Richmond, VA 23219
(804) 698-4323, Fax (804) 698-4319
Email: lbmckay@deq.state.va.us

Mills, Natalie
Economic Development Administration/Economic Adjustment Division
U.S. Department of Commerce
1401 Constitution Avenue, NW, Room 7327
Washington, DC 20230
(202) 482-2659, Fax (202) 482-0995
Email: Natalie.Mills@EAD@EDA

Mittelholzer, Michael
Maryland Department of the Environment
2500 Broening Highway
Baltimore, MD 21201
(410) 631-3772, Fax (410) 631-3896

Monteferrante, Frank J.
Economic Development Administration
U.S. Department of Commerce
1401 Constitution Avenue, NW, Room 7019
Washington, DC 20230
(202) 482-4208, Fax (202) 482-0995

Montgomery, John
IBM
5 Bedford Farms
Bedford, NH 03110
(603) 472-4102, Fax (603) 632-9045

Nagson, Norman D.
Citizens for a Better Eastern Shore
P.O. Box 882
Eastville, VA 23347
(757) 678-7157, Fax (757) 678-7216

Norris, Greg
Decision Dynamics
504 Nelson Drive
Vienna, VA 22180
(703) 319-3944, Fax (703) 319-3943
Email: gregnorris@aol.com

Nottingham, John Jr.
Northampton County Board of Supervisors
P.O. Box 66
Eastville, VA 23347
(804) 678-0440, Fax (804) 678-0483

Noyes, Neal
Economic Development Administration
U.S. Department of Commerce
704 E. Franklin Street
Richmond, VA 23219

Osdoba, Tom
Minnesota Office of Environmental Assistance
520 Lafayette Road N., 2nd Floor
St. Paul, MN 55155-4100
(612) 215-0263, Fax (612) 215-0246
Email: tom.osdoba@moea.state.mn.us

Papa, Dennis
Espey, Huston & Associates
11838 Rock Landing Drive, Suite 250
Newport News, VA 23606
(757) 596-8267, Fax (757) 596-8660
Email: ehadpapa@erols.com

Park, Angela
President's Council on Sustainable Development
730 Jackson Place, NW
Washington, DC 20503
(202) 408-5346, Fax (202) 408-1655
Email: Angelapk@aol.com

Parker, Stephen N.
The Nature Conservancy
P.O. Box 158
Nassawadox, VA 23413
(757) 442-3049, Fax (757) 442-5418
Email: steveparker@esva.net

Parry, Alex
Mayor of Cape Charles
Cape Charles Town Council
P.O. Box 391
Cape Charles, VA 23310
(804) 331-3285, Fax (804) 331-4820

Pearson, Anne
Alliance for Sustainable Communities
5103 N. Crain Highway
Bowie, MD 20715
(410) 741-0125, Fax (301) 262-3425

Perry, Russell
William McDonough & Partners
410 East Water Street
Charlottesville, VA 22902
(804) 979-1111, Fax (804) 979-1112
Email: rperry@mcdonough.com

Peters, Cherylynn
Economic Development Administration/Public Works
U.S. Department of Commerce
1401 Constitution Avenue, NW, Room 7326
Washington, DC 20230
(202) 482-4290, Fax (202) 482-3742
Email: Cherylynn Peters@PW@EDA

Pirrotta, Richard D.
Concurrent Technologies Corporation
1450 Scalp Avenue
Johnstown, PA 15904
(814) 269-2810, Fax (814) 269-2798
Email: pirrotta@corp.ctc.com

Pophal, Steve
Espey, Huston & Associates
11838 Rock Landing Drive, Suite 250
Newport News, VA 23606
(757) 596-8267, Fax (757) 596-8660
Email: ehabalnd@erols.com

Powell, Mary Beth
Center for Urban & Regional Studies
CB#3410, University of North Carolina at Chapel Hill
Chapel Hill, NC 27599-3410
(919) 962-3076, Fax (919) 962-2518
Email: powell.curs@mhs.unc.edu

Putnam, Gordon H.
Sustainable Development New Industry Task Force
6166 Winter Rose Court
Exmore, VA 23350
(757) 442-4032, Fax (757) 442-4399

Ruffin, Rev. Anthony L.
Northampton County Board of Supervisors
P.O. Box 66
Eastville, VA 23347
(804) 678-0440, Fax (804) 678-0483

Runyon, Cheryl
National Conference of State Legislatures
1560 Broadway, Suite 700
Denver, CO 80202
(303) 830-2200, Fax (303) 863-8003
Email: cheryl.runyon@nesl.org

Sessoms, Mayor Felton T.
Mayor of Nassawadox
P.O. Box 183, 8051 Sessoms Lane
Nassawadox, VA 23413
(757) 787-5886 x271, Fax (757) 787-5841

Sheeler, Michelle B.
Delmarva Power
Christiana Building, 252 Chapman Road
P.O. Box 6066
Newark, DE 19714-6066
(302) 452-6289, Fax (302) 452-6393
Email: msheeler@delmarva.com

Slone, Daniel K.
McGuire, Woods, Battle & Boothe
One James Center
Richmond, VA 23060
(804) 775-1041, Fax (804) 698-2175
Email: dkslone@mwbb.com

Smith, Tom
Department of Conservation and Recreation
Commonwealth of Virginia
1500 East Main Street
Suite 312
Richmond, VA 23219
(804) 786-4554, Fax (804) 371-2674
Email: TSmith.dcr@state.va.us

Spady, Joanne
Cape Charles Town Council
P.O. Box 391
Cape Charles, VA 23310
(804) 331-3285, Fax (804) 331-4820

Spitzer, Marty
President's Council on Sustainable Development
730 Jackson Place, NW
Washington, DC 20503
(202) 408-5296, Fax (202) 408-6839
Email: mas1@erols.com

Stiles, Barbara
Cape Charles Town Council
P.O. Box 391

Cape Charles, VA 23310
(804) 331-3285, Fax (804) 331-4820

Straub, Chester J., Jr.
Deputy Assistant Secretary for Program Operations
Economic Development Administration
U.S. Department of Commerce
1401 Constitution Avenue, NW, Room 7824
Washington, DC 20230
(202) 482-3081, Fax (202) 501-8007
Email: CStraub@doc.gov

Studholme, Ned
Science Applications International Corporation
1710 Goodridge Drive
McLean, VA 22102
(703) 917-8442, Fax (703) 903-1371

TeLego, Dean Jeffery (Jeff)
Environmental Bankers Association
110 North Royal Street, Suite 301
Arlington, VA 22314
(703) 549-0977, Fax (703) 548-5945
Email: Envirobank@aol.com

Thomas, Elizabeth L.
Vice Mayor, Town of Cape Charles
5 Tazewell Avenue
Cape Charles, VA 23310
(757) 331-9000 work, (757) 331-2377 home, Fax (757) 331-1436

Treadwell, Dwight
Camber Corporation
101 Donner Drive
Oak Ridge, TN 37830
(423) 483-7339 x240, Fax (423) 483-7439

Tregoning, Harriet
U.S. Environmental Protection Agency
401 M Street, SW
Washington, DC 20460
(202) 260-2778, Fax (202) 260-0174
Email: tregoning.harriett@epamail.epa.gov

Turner, Bruce
Federal Highway Administration
1504 Santa Rosa Road, Suite 205
Richmond, VA 23229
(804) 281-5111, Fax (804) 281-5101

Walker, Ann Hayward and Bill
Scientific and Environmental Associates, Inc. (SEA)
4605 H Pinecrest Office Park Drive

Alexandria, VA 22312
(703) 354-5450, Fax (703) 354-4467
Email: seainc@access.digex.net

Weinberg, Leo
Brown & Root
P.O. Box 3
Houston, TX 77001
(713) 676-5950, Fax (713) 676-5883
Email: bbrd295@barmso20.b-r.com

Wendell, Frank, Sr.
Cape Charles Town Council
P.O. Box 391
Cape Charles, VA 23310
(804) 331-3285, Fax (804) 331-4820

Wescoat, Suzanne S.
Northampton County Board of Supervisors
P.O. Box 66
Eastville, VA 23347
(804) 678-0440, Fax (804) 678-0483

White, John W.
Vice Chairman, Northampton County Board of Supervisors
P.O. Box 66
Eastville, VA 23347
(804) 678-0440, Fax (804) 678-0483

Witschi, David F.
Economic Development Administration/Economic Adjustment Division
U.S. Department of Commerce
1401 Constitution Avenue, Room 7327
Washington, DC 20230
(202) 482-2659, Fax (202) 482-0995
Email: David Witschi@EAD@EDA

Yancey, Tom
Norfolk District, U.S. Army Corps of Engineers
803 Front Street
Norfolk, VA 23510
(757) 441-7775, Fax (757) 441-7646
Email: ThomasNYancey@pl@nad

Zosel, Thomas W.
3M
P.O. Box 33331
St. Paul, MN 55133
(612) 778-4805, Fax (612) 778-7203
Email: twzosel@mmm.com

X. New National Opportunities Task Force Membership

Co-Chairs

A.D. Correll, Georgia-Pacific Corporation
Fred Krupp, Environmental Defense Fund

Members

John Adams, Natural Resources Defense Council
D. James Baker, NOAA, U.S. Department of Commerce
Scott Bernstein, Center for Neighborhood Technology
Carol Browner, U.S. Environmental Protection Agency
David T. Buzzelli, Dow Chemical
Henry Cisneros, U.S. Department of Housing and Urban Development
Dianne Dillon-Ridgley, Zero Population Growth
Judith Espinosa, Alliance for Transportation Research
Samuel C. Johnson, S.C. Johnson and Son Inc.
Jonathan Lash, World Resources Institute
Kenneth Lay, Enron Corp.
Hazel R. O'Leary, U.S. Department of Energy
Harry Pearce, General Motors Corporation
Michele Perrault, Sierra Club
William Ruckelshaus, Browning-Ferris Industries, Inc.
Ted Strong, Columbia River Inter-tribal Fish Commission

Liaisons

Marcia Aronoff, Environmental Defense Fund
Frances Beinecke, Natural Resources Defense Council
Rob Bradley, Enron Corp.
John Bullard, NOAA, U.S. Department of Commerce
Marc Chupka, U.S. Department of Energy
Wilma Delaney, Dow Chemical
Richard Goodstein, Browning-Ferris Industries, Inc.
Jeffrey Hunker, U.S. Department of Commerce
Jane Hutterly, S.C. Johnson & Son, Inc.
Michael McCloskey, Sierra Club
Judith Mullins, General Motors Corporation
John Platt, Columbia River Inter-tribal Fish Commission
Susan Vogt, Georgia-Pacific Corporation
Marc Weiss, U.S. Department of Housing and Urban Development
Donna Wise, World Resources Institute
Robert Wolcott, U.S. Environmental Protection Agency
Ben Woodhouse, Dow Chemical

Additional Task Force Members

F.H. Brewer III, S.C. Johnson & Son, Inc.
Maryann Froehlich, U.S. Environmental Protection Agency
Clare Lindsay, U.S. Environmental Protection Agency
Rebecca Moser, NOAA, U.S. Department of Commerce
Robert Roberts, Environmental Council of the States
Tim Stuart, U.S. Environmental Protection Agency

XI. Eco-Industrial Park Working Group Members

Ramon Alvarez, Environmental Defense Fund
John Bullard, NOAA, U.S. Department of Commerce
Ed Cohen-Rosenthal, Work and Environment Center, Cornell University
Christine Eustis, NOAA, U.S. Department of Commerce
Susanne Giannini-Spohn, U.S. Environmental Protection Agency
Timothy Hayes, Northampton County, VA
Jerry Kotas, U. S. Department of Energy
Rick Luna, Brownsville, TX
Amy Manheim, U.S. Department of Energy
Jerry McNeil, National Association of Counties
Natalie Mills, Economic Development Agency, U.S. Department of Commerce
Jackie Prince-Roberts, Environmental Defense Fund
Harriet Tregoning, U.S. Environmental Protection Agency

Task Force Coordinator
Martin Spitzer, JD., Ph.D.

APPENDIX A: ECO-INDUSTRIAL PARK PRESENTATIONS

(Slide presentation charts available upon request.)

APPENDIX B:

PLENARY PRESENTATIONS

Six speakers were each invited to give a ten-minute presentation on the topic areas participants identified as most important in developing eco-industrial parks. Speakers who gave presentations on the following three topic areas submitted overheads and summaries, which are included in this appendix, and available upon request.

A. Crafting Industrial Ecosystems

B. Recruiting New Firms and Retaining Existing Companies

C. Finance