

CLOSING THE LOOP

A newsletter on industrial ecology. Changing gears towards green productivity.

3rd QUARTER 1999

UPFRONT

INDUSTRIAL ESTATES FIND NEW WAYS TO HANDLE WASTE



Locator companies from LIIP join the awareness seminar.

What do we do with our industrial waste? Can we find a viable market for it? Is there a listing where we can advertise our by-products for sale or alternative disposal?

Such queries were raised in an awareness seminar for industrial estates on alternative waste management. The seminar series entitled *Industrial Ecology and the Business of By-Product Exchange Within and Among Industrial Estates*, were held in August and were given to locator companies of Carmelray Industrial Park, Lima Technology Center, Light Industry and Science Park (LISP), and Laguna International Industrial Park (LIIP).

Concepts of industrial ecology and its tools like by-product exchange were discussed and served as catalysts for the estates to look for more viable ways of disposing their waste. Industrial ecology is an emerging approach that looks at the entire systems of industrial processes and modifies them such that waste is minimized and resources are optimized. One way of applying industrial ecology is through by-product exchange. Here, a locator company can either sell or give for free its "waste" or by-product to another company needing it as raw material or substitute.

During the seminar, the locator companies were asked to fill out a survey form on their materials, water, and energy usage as well as the by-product they generate. The consolidated data would become the basis of possible matches where companies can either directly exchange by-products or find a market for these. The possible exchanges would not be limited to locators inside one estate only. If the exchange would prove viable for two companies in different estates, then a bilateral deal could be struck. Independent buyers not located in an industrial estate might also get into a deal with another company so long as the exchange would remain economically viable.

Seminar participants also raised questions on how they could go about regulations posed by the Philippine Economic Zone Authority (PEZA). Certain regulations might hamper the exchange, like transport of waste from one site to another. Here, a new set of modified policies might be needed to facilitate the exchange without violating existing rules.

Joining in the seminar was a local expert on industrial ecology, Dr. Antonio Alcantara, professor at the School of Environmental Science and Management (SESAM) at the University of the Philippines in Los Banos. Also sharing their experiences in the awareness seminars are Cecil Corloncito of Aquagem Environmental Consultants; Redd Asprer, estate manager of Lima Technology Center; Rosalito Dominguez, assistant vice president for operations at LISP; Edil Mendoza, assistant manager for environment, LISP; Gil Abaquin, estate administrator for LIIP; Nissa Suarez, PEZA manager for LIIP; and Rommel Alviar, pollution control officer of Carmelray.

The seminar series was conducted by the Industrial Ecology Module of the PRIME Project. PRIME or *Private Sector Participation in Managing the Environment* is a project of the United Nations Development Programme (UNDP) and is implemented by the Board of Investments, Department of Trade and Industry (BOI-DTI).



Ghetie Pascual-Sison, Project Manager of the Industrial Ecology Module, PRIME Project talks during the seminar.

MESSAGE FROM THE PROJECT DIRECTOR

It was conventionally viewed that environment was a nemesis to business. Now, we see it as a competitive advantage of businesses.



We encourage the private sector to initiate and sustain environmental guidelines and policies within their respective companies. In the process, we present to them how they can benefit economically from such initiative. And help them protect the environment.

How do we do this? One such approach is through **industrial ecology**. This innovative concept offers a new way of thinking. Simply put, it proposes to minimize the generation of industrial waste while maximizing the use of resources. It looks at the entire industrial systems, proposes to redesign it such that industrial processes remain sustainable and environmental impact is lessened.

Industrial ecology modifies the linear production processes (from extraction of raw material, production, up to final disposal), and proposes to "close this production loop." Materials, water, and energy use is optimized, waste generation is decreased. Ultimately, this translates to a better economic bottom line.

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GET CASH FROM YOUR TRASH

Yes, there is money in industrial waste. Many companies do not realize that the by-products generated from their production processes have market value. Some industrial by-products can be sold to another firm needing it as a raw material or a substitute. Compatible industries could exchange their by-products and eventually strike a business deal. Instead of directly disposing waste, these by-products can be re-used or re-processed by another firm.

Such is the concept of by-product exchange. In a by-product exchange, the inter-plant collaboration generally improves the environmental and economic performance of the com-

panies involved, both individually and collectively. Companies tend to gain savings from disposal costs. This transaction also helps firms


avoid future liabilities that may arise from improper waste handling. Further, the company buying the by-product reduces its use of virgin materials. The one selling the by-product, in turn, reduces pollution.

A by-product exchange (BPX) can take place 1) between two or more companies within an industrial estate (proximity is an advantage when it comes to by-product transport), 2) between or among industrial estates, 2) between a locator in an estate and another not confined within an estate (outside participant), 3) between or among



outside participants, or 4) regional. So long as the transaction is deemed viable and economical, and the processes of doing so do not violate any estate laws or national environmental regulations, then by-product exchange is possible.

Currently, a BPX program is being pilot-tested among five industrial estates. These are: Carmelray Industrial Park (CIP), Laguna International Industrial Park (LIIP), Light Industry and Science Park (LISP), Laguna Technopark Inc. (LTI), and LIMA Technology Center.

This program is a pilot test of industrial ecology (and its tools) in the Philippines. This is being done through the Industrial Ecology Module of the PRIME Project. 

Eco-Industrial Parks

A NEW BREED OF INDUSTRIAL ESTATES EMERGING

An eco-industrial park is a community of manufacturing and service businesses seeking enhanced environmental and economic performance. Collaboration can be done by managing environmental and resource issues including energy, water, and materials. By working together, the community of businesses seeks a collective benefit greater than the sum of the individual benefits each company would realize if it optimized its individual performance only. The goal of an eco-industrial park is to improve the economic performance of the participating companies while minimizing their environmental impact.


A firm involved in an eco-industrial park stands to decrease production costs through increased materials and energy efficiency, waste recycling, and elimination of practices that incur regulatory penalties. As an offshoot, increased efficiency may also enable estate members to produce more competitive products. Further, the estate and its members may share resources for waste management, training, purchasing, emergency management teams, environmental information systems, and other support services.

Incorporating the concept of eco-industrial estates is best done during the planning stage of an estate. This way, infrastructure needs are initially determined, deeming it financially practical for the developer. Also, it is in the early stages of development where both

anticipated and unforeseen problems and liabilities, like waste management, are seen. A feasibility study will do good in mapping out the environmental management that the estate management will take and eventually, trickle down to its member locators. An estate developer will also realize its competitive advantage in terms of marketing the property to prospective investors. An estate that has a viable set of environmental laws and regulations makes the property very attractive to firms who will locate in that area.

The concept of eco-industrial park is being piloted through the Philippine National Oil Company (PNOC) in Limay, Bataan. PNOC, a petrochemical plant. It hosts three firms: a polyvinyl chloride (PVC) plant, a polypropylene manufacturer, and a polyethylene plant. Feedstock naphtha comes from the nearby Petron Bataan refinery to the upstream olefin plant (or cracker).

The ethylene and propylene produced by the cracker are used as raw material of the downstream plants such as the polypropylene plant and the polyethylene plant. The products of these two plants, as well as the PVC resins, are used as raw materials for the manufacture of plastic products such as monobloc chairs, plastic packaging materials, toys, and others.

The pilot-testing of eco-industrial parks is being conducted by PNOC through the Industrial Ecology module of the PRIME Project. 



PNOC: an eco-industrial park in the making

MAKE THE ENVIRONMENT YOUR COMPETITIVE EDGE

by Aloisa Santos



PRIME Project or Private Sector Participation in Managing the Environment is an environmental partnership of the United Nations Development Programme and the Board of Investments-Department of Trade and Industry.

PRIME aims to strengthen private sector initiatives that reduce the environmental footprint of industry. We would like to help businesses become competitive in the global marketplace through environmental management. Find out how environmental management is as much a business opportunity as it is a business strategy through its four modules:

Module 1

We can help your industry association craft its own **Business Agenda 21** – an action plan for environmental management. To date, 63 industry associations have submitted their Business Agenda 21, the result of which will be presented at the Envirotech '99 national roundtable.

Urban Tech 21 can help your company reduce gas emissions that cause global warming. Take part in the seminars for more information on bottom line benefits of adopting appropriate technology that would reduce carbon dioxide and methane emissions.

Module 2

You can reduce waste through **industrial ecology**. This concept mimics the closed loop materials and energy flows found in natural ecosystems where the output of one organism becomes the input of another. We can facilitate by-product exchange in your industrial estate. Reduce your disposal costs by recycling materials and energy, make use of the by-products of another firm as your production input, or vice versa. Five industrial estates, namely Carmelray, Lima Land, Light Industry and Science Park, Laguna International Industrial Park, and Laguna Technopark, are starting to set up by-product exchange.

Module 3


Meet international standards by becoming certified to ISO 14001 **environmental management system**. Ten pilot SMEs are currently implementing EMS. Their representatives likewise learned firsthand from visits to various ISO 14001 certified SMEs in Singapore. The Bureau of Product Standards offers ISO 14000 awareness seminars that you can attend.

Also, PRIME is facilitating the Ozone Friendly Mark, a voluntary recognition scheme for companies that have reduced the use of substances that deplete the ozone layer.

Module 4

We would like to create an investment climate that will encourage you to go into **environmental entrepreneurship**. A policy study has identified the necessary incentives for you to venture into services like environmental consultancy, engineering services, training, laboratory and testing services, and environmental certification (ISO 14001).

We have likewise facilitated the evaluation and accreditation of 14 academic and commercial laboratories to provide environmental analysis. Another 14 laboratories are slated to undergo this process late this year.

Visit www.prime.org.ph/mod4frm.html for environmental information like environmental policies and regulations, Environmental Management Systems, technology updates on clean technologies, and available financial facilities. If you are involved in environmental services, take advantage of a free listing in our databases. 

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MESSAGE FROM THE PROJECT DIRECTOR...

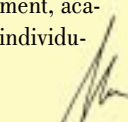
We are piloting industrial ecology in the country by using several approaches. One is through by-product exchange where one estate locator can sell waste or by-products to another company (within or outside the same estate) that may need them as raw material or substitute. Currently, five industrial estates are participating in a pilot program of by-product exchange.

Another approach is through redesigning industrial estates into "eco-industrial parks." Here, another selected estate participates in modifying the park into an eco-friendly park through methods like cleaner production, life cycle analysis, and green chemistry, among

others.

But these strategies are not so popular in the country yet. That is why we have come up with a newsletter that will hopefully raise awareness among the concerned sectors. These strategies may seem promising but people will have to know more about them first before these are appreciated and applied.

Here, an initial offering of industrial ecology to businesses, the government, academe, and other interested individuals.



RAUL V. ANGELES
Project Director
Industrial Ecology, PRIME Project

The Mushroom Story

Sometimes, all it takes is common sense.

An entrepreneur engaged in mushroom growing and canning sought to allay public agitation. The company was worried about two kinds of waste being generated from the process line: the mushroom fleshings, an outcome of breakage and damage in handling, and the waste water from the blanching of mushrooms.

Options were explored like pit composting to high-rate bio-methanation, and from lagooning to ozonation. But the entrepreneur came up with a cheaper solution. He took a can of mushrooms, collected some of the "wastewater" and the "solid waste." He mashed the solids and mixed them with fresh hot water from the blancher. He added some salt and spice and wala! concocted an instant soup. Market-wise, the price of canned mushroom soups of most popular brands closely matched that of the canned mushroom soup in the market. An estimated increase in turnover by nearly 30 percent was mind-boggling. An instant recipe for zero discharge at zero investment with zero gestation emerged.

The lesson: look within the process rather than searching the drains. View things as pollution control at profit rather than at cost. Plug wastes at source and recycle with least capital investment. Use production equipment in place of traditional treatment plants and substitute capital with low cost innovation. 

Source: Paper presented by Ashok Sharma at the Second Asia-Pacific Cleaner Production and Roundtable Expo 1999

CLICK HERE!

Web surfers can find the Industrial Ecology Module of the PRIME Project and other useful links at:

<http://www.prime.org.ph>

BOI SET TO "GREEN" APPLICATION PROCESS

by Ria Ancheta

Application for an Environmental Compliance Certificate or ECC is now being simplified. This is an offshoot of an agreement forged by the Department of Trade and Industry (DTI) and the Department of Environmental and Natural Resources (DENR). The agreement to streamline application procedures required by both parties started in 1997 and is currently being implemented by the Board of Investments-DTI, with the cooperation of Environmental Management Bureau-DENR.

This agreement, nicknamed "Greening the BOI Procedures" simplifies procedures when applying for an ECC, a requirement for projects with significant environmental impact under PD1586 or a proclamation establishing an Environmental Impact System in the Philippines. The ECC, being issued by the DENR, is a document that gives guidelines and conditions to companies or project proponents. This is to ensure that firms comply with environmental laws and standards.


The BOI's participation in "Greening" involves:

(1) Integrating a portion of the ECC application process with that of existing BOI procedures, where applications for ECCs are assessed at the BOI before being sent to the EMB for final processing and review. The integration envisions a more efficient system in assessing projects

which will eventually lead to lesser time needed to process applications and lesser application costs.

(2) Building the capability of BOI personnel by giving them environmental training and seminars, and involving them in conducting initial environmental examinations of projects. In turn, these personnel, particularly those dealing directly with project proponents and investors, will be able to provide information regarding requirements for an ECC, and to pre-assess projects at the BOI level.

(3) Restructuring of the BOI Environmental Unit to accommodate firms and proponents with queries concerning environmental compliance standards, information sources for environmental technologies, processes, funding, and networking with other organizations on environmental issues and concerns.

"Greening the BOI Procedures" is envisioned to fulfill the country's goal to achieve economic growth with proper environmental management. With the growing concern and cooperation between government agencies, the private sector, and the public community towards this goal, the country can look forward to a cleaner, more efficient, and more productive business climate. 



Firms required to build "forest park"



Are you ready to plant trees? You'd better be, if your company is signed up at the Board of Investments (BOI).

According to Memorandum Circular No. 01, BOI-registered firms are required to undertake a tree-planting program by creating a "forest park" in the companies' premises. This requires planting at least 100 for-

est trees in a cluster, at a distance of four meters apart within its premises, or if not possible, to plant along the perimeter of their compounds at least 100 forest trees at a distance of two meters apart.

Firms located in a commercial district or areas with no adequate provision for land may plant trees according to the requirements set by the governing authority in that area. Or, companies may donate the cost of planting trees to the local government unit in charge of the public park and/or reforestation project in the area.

SEMINAR FOR NEW INDUSTRIAL ESTATES

The Industrial Ecology Module of the PRIME Project and the Philippine Chamber of Industrial Estates (PCIE) have teamed up for an awareness seminar to be held in November 1999.

The seminar will be about industrial ecology and eco-industrial parks. These new approaches propose to make industrial parks more competitive by offering them sustainable waste management that can even become profitable.

Joining in this event are international experts on industrial ecology from Indigo Development, a US-based consultancy firm, and United States - Asia Environmental Partnership (US-AEP).

For details, you may contact the Industrial Ecology Module at 895.8233 or 899.5688. Email at prime@skynet.net.

ENVIRONTech '99

Be a part of the country's biggest annual environmental event - EnvironTech '99 slated from 29 September to 2 October 1999 at SM Megatrade, Building B, SM Megamall, Mandaluyong City.

This year's theme is "Green Business for the Green Consumer" featuring the latest in green technologies and products.

For more information, contact the EnvironTech Secretariat at 635.2650 to 51 and 635.3670 (telephone), 631.5714 (fax) or send email to ctem@csi.com.ph.

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