Figure 22.3

The flows of resources in the integrated biosystem of the Moniiori Boys’ Town in Suva, Fiji. (Courtesy of R. Klee, Yale University.)

Figure 22.4

Flows of resources in the eco-industrial system at Kalundborg, Denmark. (Courtesy of M. Chertow, Yale University.)
ECO-INDUSTRIAL PARKS across the USA:
(Source: http://www.usc.edu/schools/sppd/research/NCEID/Profiles/Mini_Sites/)
(22 November 2002)

The Londonderry Ecological Industrial Park, New Hampshire

The Town of Londonderry, NH is using eco-industrial development to address the negative effects of rapid growth. Londonderry has become one of New Hampshire's fastest-growing communities, and residents have mobilized to preserve the town's agricultural heritage and promote environmentally and culturally appropriate development. The Londonderry Ecological Industrial Park, an outcome of this mobilization, is one of the nation's prime examples of eco-industrial synergies. One tenant of the Park, a plastics recycling company, purchases waste plastic from Stonyfield Farms Yogurt, a firm located next to the Park. The Park has also attracted AES, a power company that will develop a 720 MW combined cycle natural gas power plant for the site and will use treated wastewater pumped from the City of Manchester's Waste Water Treatment Facility. In order to meet the Park's environmental standards, which are overseen by a citizen committee, the company has revolutionized environmental design of power plants.

Intervale Food Center (Burlington, Vermont) (Formerly Riverside Eco-Park)

The Intervale Food Center is a sustainable agricultural-based project emerging from discussions between citizens and city officials who recognized the potential of an eco-park as a model of sustainable development. This eco-park is a partnership of the public, private, and non-profit sectors. It exemplifies sustainable development through emphasis on the principles of cooperative industrial ecology - waste products from one industry become the raw materials for another. The vision for the Intervale Food Center is the integration of sustainable agriculture with cutting-edge technology.

This four-acre parcel utilizing the existing McNeil Generating Plant is being developed to improve both Burlington's economy and quality of life. It will consist of a complex of greenhouses and buildings utilizing "waste" heat (steam), a by-product from burning wood chips (renewable bio-mass fuel technologies) at the McNeil Plant. The McNeil Plant has also taken an innovative step in renewable energy production with the biomass gasification project.

The facility will be comprised of 10,000 square feet of business space and 50,000 square feet of bioshelter (greenhouse) space. Ideal tenants are those who can then utilize the low-grade heat produced at the McNeil Plant to complete the energy-waste-energy cycle through a symbiotic closed loop. The eco-park currently has community gardens, citywide composting, wind power, and a Living Machine demonstration project. The eco-park is envisioned to include a range of sustainable and restorative uses related to organic agriculture, biotechnology, aquaculture, and 'living machine' technology. The
living machine utilizes living plants to complete the chemical conversion to turn liquid organic waste from the food industry into viable products such as fertilizer and fish food.

Red Hills EcoPlex, Choctaw County, Mississippi

In Choctaw County, MS, a public/private partnership is developing the Red Hills EcoPlex, an EIP centered around a 440MW lignite-fired circulating fluidized-bed power plant and an adjacent lignite mine. The project aims to attract a symbiotic mix of companies that can use the byproducts of the power plant (for example, steam, fly ash, bed ash, residual thermal energy). The Red Hills EcoPlex has identified a number of primary target tenant industries based on industry requirements and potential contribution to the EcoPlex symbiosis. Targeted industries include intensive aquaculture, hydroponic green housing, poultry processing, and food processing. The adjacent lignite mine operations expose substantial quantities of clay, and marketing efforts have placed some focus on recruiting a brick manufacturer.

Triangle J Council of Governments, Research Triangle Park, North Carolina

The Industrial Ecosystem Development Project explored the potential for creating an eco-industrial network over the six-county area served by the Triangle J Council of Governments in North Carolina. The Project held two primary objections: 1) to cut costs and reduce the use and disposal of natural resources by industries, and 2) to create more sustainable communities by identifying ways to turn wastes into useful products and reduce the generation of greenhouse gases in the air, pollution in the water, and trash in landfills.

The project surveyed 182 industries and institutions in the region to gather data on the byproducts they had that might be usable by somebody else and the inputs they used that might be furnished from another facility's byproducts. The Project used this data to identify potential partnerships for the reuse of materials, water, and energy. The project facilitated networking opportunities between potential partners. During a one-year period, the project identified possible new partnerships for 48% of the facilities participating in the project.

Saint Peter, Minnesota

Saint Peter, Minnesota, a community of about 10,000 people, is looking at how to transform a 160-acre grass-strip airport runway into a high-performance industrial park, with the assistance of e4 partners. The economic development objectives of Saint Peter include expanding and diversifying the local tax base, creating quality job opportunities, generating local wealth, and efficient use of community and land resources. Businesses locating in this state-of-the-art business center will improve their financial performance by following comprehensive resource efficiency strategies.
This eco-industrial park planning project is in Phase 1, the Feasibility Study. e4 partners have conducted a preliminary analysis of the resource flows in and around the community and among industries. Several economic development opportunities were identified that could capitalize on the agricultural resource base in the surrounding area.

A biochemical production system could produce several different products using bio-based oils, with a focus on Minnesota-grown soybeans. This system would seek balance and diversification by producing for existing markets (inks, food products), while building new markets for biodiesel (blended in various proportions with petroleum diesel), nutraceuticals (nutritional supplements, vitamins, medicines), and possibly the most promising product line, industrial lubricants (chain saw and bike chain lubricants, two-stroke engine oil, hydraulic fluids).

Saint Peter will also look to grow food for home. Very little of what is produced by area farmers actually goes to feed community residents. Large institutional food service programs and an existing retail grocery cooperative provide the building blocks for this to happen. A commercial-scale greenhouse, combined with specific niche market production and processing, is planned to serve these markets. The production cycle will be closed with a food waste composting operation, which may be combined with high-nitrogen biosolids to produce marketable compost.