ECONOMICS OF ECO-INDUSTRIAL DEVELOPMENT

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GOALS AND CHALLENGES

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A Market Approach
- Goals and challenges for eco industrial
- What defines an eco industrial park?
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- Local efforts and strategies underway
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Goals and challenges

Goals
Natural Resource Goals
- Reduce impacts on natural environment
- Reduce waste
Economic Development Goals
- Serve businesses
- Grow revenues and create jobs

Challenges
- Costs
- Perceptions (about costs)
- Accounting
- Public policies

Natural resource goals and methods

- Reduced impacts
  - Green building
  - Production systems design
  - Clean and sustainable energy sources
  - Regional coordination
- Waste reduction
  - Efficiencies (parkwide and each business)
  - Shared systems
  - Shared resources

Economic development goals

- Reduced operating costs
  - Shared systems
- Co-Branding Benefits

Source: Canadian Agra, 2007
The Bruce Eco Industrial Park, Ontario Canada.
**ECONOMICS OF ECO-INDUSTRIAL DEVELOPMENT**

**POTENTIAL CHALLENGES**

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**Definition of sustainable**

Sustainable

- Sustainability speaks to the rate of resource replenishment compared to the rate of resource depletion over a given period of time.
- Resources replenished while they are depleted are more sustainable.
- Resources used without regard to replenishment are less sustainable.
- Applies to economic resources—Municipal funds, tax dollars, labor and talent, and more.
- Applies to environmental resources—water, trees, clean air, and more.

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**Accounting problem**

- Purpose of accounting:
  - Recognize
  - Measure
  - Disclose
- Required only for financial activities, narrowly defined with direct impacts
- Avoids costs of unsustainable natural resource depletion
  - Energy, water, air, much more

- Easily avoidable without regional strategy and public policy that agrees on the costs
- Lots of permitting and regulation, but not a lot of costs
- Pricing covers costs of infrastructure (transportation, schools)

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**Public Policy Challenge**

- External costs are easily avoidable without public policy that agrees on the costs
- Requires a regional strategy tied to growth scenarios and planning
- Lots of permitting and regulation, but not a lot of costs
- Pricing covers costs of infrastructure (transportation, schools)

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**Shared systems**

- Recycling systems
- Solid waste
- Waste water
- Energy auditing and controls
**Shared resources**

- Shipping resources
- Vehicle maintenance
- Common buying, customer/supplier (depends on common needs)
- Integrated logistics
- Human capital development (benefits, wellness, recruiting, training, job-sharing)
- Information and communication systems
- Shared subcontractors

**Reduced operating costs**

**Production and Distribution Efficiencies**
- Intra-park transportation, circulation (examples?)

**By-product connections**
- Cogeneration (e.g., capturing and using heat generated by power sources)
- By-product connections

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**Collaborative branding and marketing**

- Green branding
- Market development (customers that value sustainability)
- Partner development
- Collaborative promotion

**ECONOMICS OF ECO-INDUSTRIAL DEVELOPMENT EXAMPLES**

**Bruce Eco Industrial Park, Ontario**

**Devens Eco Industrial Park, MA**

- 1,800 acres
- Eco-industrial park and mixed use community
- $2.1 billion of private investment
- Public investment of $100 million for cleanup and new infrastructure
- Largest construction and demolition recycling site in the US
- 98 companies at the eco-industrial park with 5,000 employees
- Bristol Meyers Squibb (97 acre campus)
- Evergreen Solar uses a 350,000 sf plant for the manufacture of photovoltaic panels
- Magnum Motion
  - Maglev equipment
Devens Eco Industrial Park, MA

- Environmental programs
  - Awards program with 25 standards for company environmental performance
  - Supports business collaboration to utilize by-products, share costs of joint training, share transportation resources, and more.
  - Eco-Efficiency guidance services to tenants.

Kalundborg Denmark

- Resource savings:
  - Ground water: 1.9 mil. m³/year
  - Surface water: 1.0 mil. m³/year
  - Oil: 20,000 ton/year
  - Gypsum: 200,000 ton/year

- Investment
  - Total investments in 19 Projects: ~ $75 million
  - Annual savings: > $15 million
  - Total savings until 1998: ~ $160 million

Source: Andreas W. Koenig, ReTem Corp, 2012

Seattle’s Industrial Development Pilot Program

Industrial Development Pilot Program

- Partnership between the City of Seattle, King County and the State of Washington
- RFP for pilot projects that will result in public and private sector investment in new or rehabilitated industrial facilities
- Increased economic and environmental performance by industrial firms
- Incentivize industrial investment through regulatory and policy flexibility, and financial incentives
  - New Markets Tax Credits Loan Program, Grow Seattle Fund Loan Program, workforce training, others
- Seeks to support up to 10 pilot projects that demonstrate a new model for the region’s industrial economy

Puget Sound Regional Council

Vision 2040

- Tied to regional PSRC growth forecasts for 2010-2040
- Includes a Climate Change Action Plan
  - address state climate change initiatives;
  - reduce greenhouse gas emissions;
  - specific mitigation steps to address climate change impacts

Transportation 2040

- Tied to PSRC regional growth forecasts for 2010-2040
- Includes the Regional Transportation Improvement Program
  - Contains a four part Greenhouse Gas Strategy
  - Tied to EPA and state mandates on air quality
Washington State

Washington Clean Energy Leadership Program
- Regulatory and Clean Energy Policy Alignment
- Align Clean Energy Policy and Regulation
- Accelerate High Profile Clean Energy Development
- Create a Fiscal Point for Clean Energy Economic Development
- Time frame of 2012 - 2020
- Progress measured through job growth in clean energy jobs

King County

- 2012 King County Strategic Climate Action Plan (SCAP)
  - Synthesizes King County's goals, objectives, and strategies to reduce greenhouse gas emissions and prepare for the effects of climate change
  - Level of GHG's is used as benchmark with reduction goals set for 2015, 2020, 2030 and 2050

Eco Industrial Market Challenge

- Eco industrial parks try to account for environmental costs
- Businesses bear those costs on-site
  - Rent, shared infrastructure costs, internal operations
- Traditional industrial parks offer lower out-of-pocket costs as a cheaper alternative
- Shifts willingness to pay to owners' personal values for resource management

Federal

- Environmental Protection Agency Greenhouse Gas Reporting Program
  - Mission to understand where greenhouse gas emissions are coming from in order to inform policy decisions

Planning and implementation strategies

- Analyze and make the business case for tenants
  - Higher rents, but lower operating costs
- Match business needs with partners and customers
- Make public case for infrastructure investments
- Recognize, measure, disclose natural resource depletion costs
- Regional strategies for water, energy