



Summer European University 2003

Chalons-en-Champagne, July 7 – 17, 2003

ENSAM Université de Technologie de Troyes,
Conférence des Directeurs des Ecoles et Formations d'Ingénieurs,
Ville de Chalons, Ville de Troyes, Région Champagne-Ardennes,

Technology and Sustainable Development in Europe today

Eco-Industrial Development : A Strategy for Sustainable Industrial Development?

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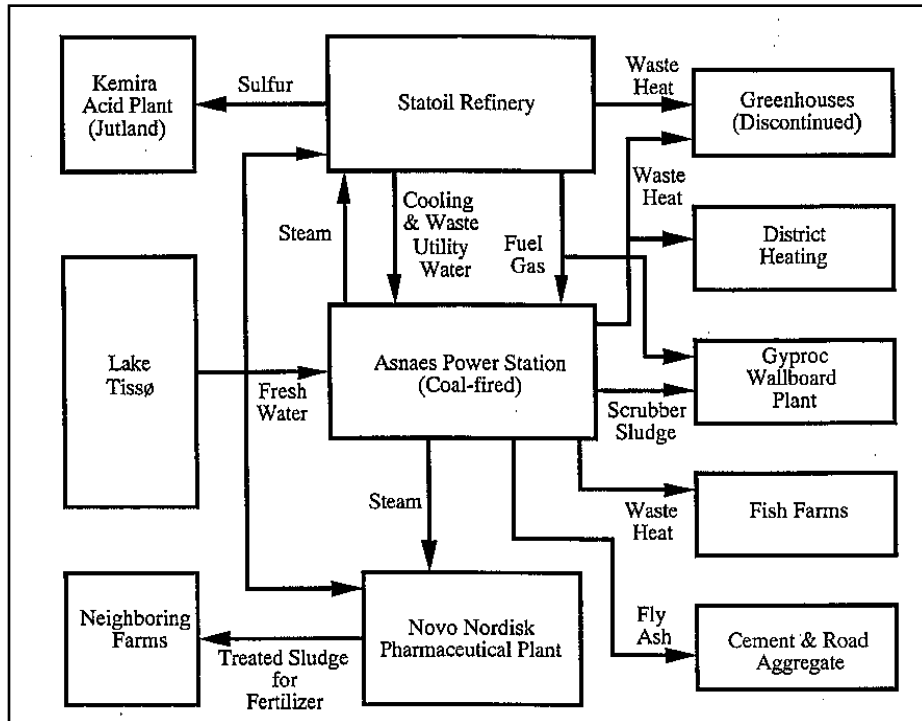
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Abstract

Over the last decade, the concept of sustainable development has become commonplace in policy documents at all levels attempting to integrate economic and environmental goals. Translation of the concept from rhetoric to reality has not proven easy. At the local and regional scale, enthusiasm for sustainability has been more significant within the public sector than it has within the private sector, where there has been a more cautious response from the business community in driving the sustainable development agenda. It therefore becomes apparent that the shift towards more sustainable forms of industrial development on a wider scale requires significant changes in the way the private sector operates.

This paper will explore an emerging approach which has become the subject of increasing debate and analysis amongst policy-makers and academics searching for new ways to organise production activity in order to meet the elusive goals of sustainable development at a local and regional level. Eco-industrial development proposes that economic and environmental goals can be reconciled through the creation of more integrated industrial systems. This approach re-examines the way firms operate within industrial estates and business parks in particular by moving the focus for action beyond the level of the firm in areas such as resource efficiency and waste management. It is the emphasis on connectedness and collaboration between firms which is argued to contribute to sustainability by enhancing environmental performance and improving business competitiveness at both a firm and site level. The shift towards eco-industrial forms of development will be then be explored empirically, drawing upon a regional case study from the UK.

Eco-Industrial Development: A Strategy for Sustainable Industrial Development?



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The Challenge of Sustainable Development



- Sustainable Development emerged as guiding principle in policy discourse and strategy at all levels
 - “...development which meets the needs of the present without compromising the ability of future generations to meet their own needs”
(World Commission on Environment and Development, 1987, p.43)
- Commonplace in policy attempting to integrate economic, social and environmental goals

Problematic Concept?



- Sustainable Development as a problematic concept
- Multiple definitions and interpretations
- ‘Fuzzy’ concept (Markusen, 1999)
- Tensions in translating theoretical ideas and rhetoric into more pragmatic policy programme

Operationalising Sustainable Development



- Importance of the local and regional scale in implementing sustainable development

“...local responses to this international call to arms that will determine its success or failure as a practical programme.”

(Munton, 1997, p.48)

- Sustainable Development informing policy and strategy at a sub-national level in the UK
- Emphasis on the role of the public sector
- More cautious response from the private sector

The business response to sustainability: corporate greening as the first step?



- Business response to sustainable development closely parallels process of corporate greening throughout 1980s
- Pressures to improve environmental performance of business
- Opportunities and evidence of change
- Process criticised:
 - Reactive, slow and incremental change
 - Emphasis on behaviour of individual firms
 - Approaches failed to integrate economic and environmental goals

Pressures for business to engage in sustainable development

- Key principles of sustainable development as environment, futurity and equity
- Directly linked to growing legislative pressures upon business:
 - Energy and resource consumption/efficiency
 - Waste management
 - Pollution abatement
- Growing political pressures:

“Just a few years ago a conference about business and sustainable development would have been focussing on whether it was a serious business issue and if there was a business case for responsible corporate behaviour. I would argue that is no longer the case. The questions today are not whether, but what can be done; not if there is a business case, but just how far that case stretches”

(Margaret Beckett, Secretary of State for the Environment, 2003)

Approaches to sustainable development: Integrating economy & environment



- The sustainability spectrum (Turner, 1993)
- Weak versus strong: theoretical interpretations and practical implications

“...these two positions represent divergent paradigms: a dominant social paradigm of expansionist or growth economics based upon maintaining current capitalist relations; and a ‘new paradigm’ based upon steady-state economics which is rooted in deep ecological thought.”
(Chatterton, 2002, p.552)
- Reconcile economic competitiveness and environmental improvement through innovation, modernisation and technological improvement
- Growing evidence of economic & environmental policy integration in policy discourse and business practice

Eco-Industrial Development: A strategy to integrate economy and environment?



- An opportunity for business to engage in sustainable development?
- Emerging concept
- Eco-Industrial Typology (Research Triangle Institute, 2001)
 - Mixed-use developments involving industrial, commercial and residential activity
 - A site with environmentally-friendly infrastructure, construction or design
 - An industrial park designed around a single environmental theme e.g. solar energy
 - A collection of companies involved in green manufacturing and production
 - A collection of environmental technology companies
 - A recycling business cluster containing firms involved in resource recovery and the remanufacturing of waste materials
 - A single by-product exchange pattern or network of exchanges

Defining characteristics of EID (1): Integrating economic & environmental goals



- EID proposes the creation of more integrated industrial systems
- Re-examines the way firms operate within industrial estates, business parks and the wider industrial system by moving the focus for action beyond the level of the firm in areas such as energy, resource and waste management
- This is argued to contribute to enhanced business competitiveness and improved environmental performance at both a firm and wider level

“It is not the product or the service that is the leading aspect here, but the joint ambition of firms located on the site to organise their activities in such a way that environmental goals are served without obstructing economic performance, or even better, by enhancing performance”

(Pellenbarg, 2002, p.65)

Defining characteristics of EID (2): Networking and collaboration



- Moving the focus for action beyond the level of the firm by encouraging collaboration and networking behaviour between firms in order to facilitate both material and non-material exchanges:
 - Logistics, research, recruitment and service provision
 - By-product exchange based upon the principles of Industrial Ecology
- EID as a new concept?
- What are the alleged benefits of eco-industrial development?

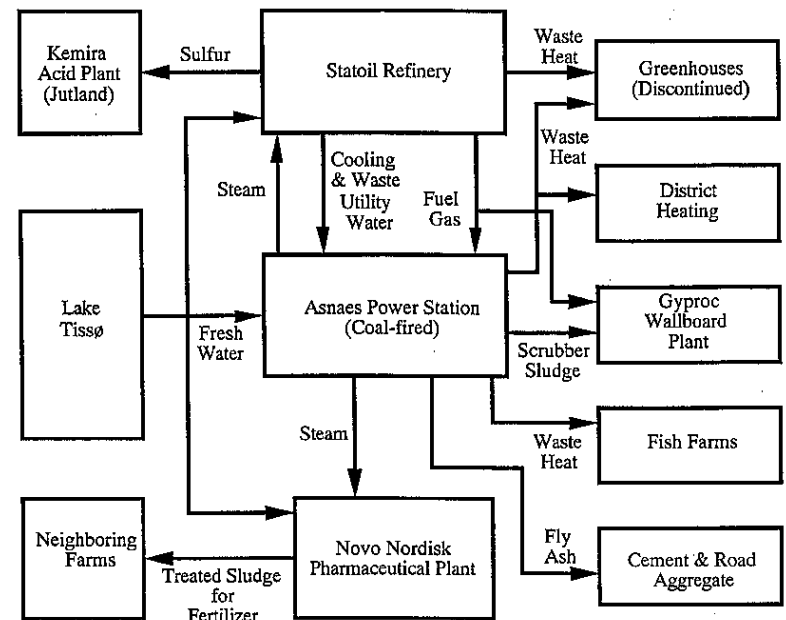
“By working together, the community of businesses seeks a collective benefit that is greater than the sum of the individual benefits each company would realise if it optimised its individual performance only”

(Lowe et al, 1996)

Eco-Industrial Development in practice

- Leading example of eco-industrial activity is the industrial system at Kalundborg in Denmark
- Is it possible to develop industrial symbiosis on a more conscious level?
- PCSD programme to develop Eco-Industrial Parks in the United States in the early 1990s
- Need to develop more detailed critical and empirical analyses of the concept

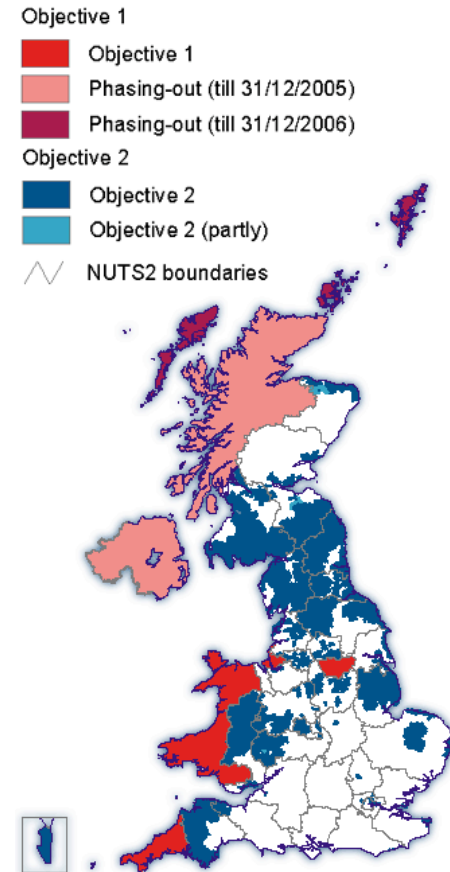
Industrial Symbiosis at Kalundborg



Source: Ehrenfeld, J. and Gertler, N. (1997)

Moving towards eco-industrial development in the UK

- Evidence of various projects which could be interpreted as eco-industrial in the UK
- Regional Case Study: Yorkshire & Humber
- Examine one emerging project in particular: Humber Industrial Symbiosis Project
- Examine some of the issues raised when developing eco-industrial forms of development
- Does it provide new opportunities for business to engage in the concept of sustainable development?



Humber Industrial Symbiosis Project (HISP)



- The Humber Industrial Symbiosis Project (HISP) is part of national programme encouraging networking and by-product exchange between firms on a regional basis
- HISP is being led by the Business Council for Sustainable Development-UK, a private sector organisation promoting 'practical and profitable' sustainable industrial development in the UK
- The project is currently being developed by an environmental consultancy firm, in conjunction with the local authorities and the Regional Development Agency
- Following an initial feasibility study, the developers are currently in the process of identifying 15-20 firms in the area who are willing to participate in this 'virtual' eco-industrial site as firms will be connected on a regional basis
- The aim of the project is to identify commercially viable synergies between inefficient and disparate activities through inter-company co-operation and networking (BCSD-UK, 2002)

Political and business support for Symbiosis



“Industrial symbiosis has the potential to reduce the environmental impact of UK business and help it increase its resource productivity. DTI therefore welcomes the proposal from the BCSD...”

(Douglas Robinson, Department for Trade and Industry)

“Smarter use of industrial and other by-products can help improve business productivity and reduce waste. The CBI welcomes initiatives such as NISP as an innovative way of finding practical solutions to this challenge delivered regionally.”

(Michael Roberts, confederation of British Industry)

Eco-Industrial development as a tool for integrating economic and environmental goals?

“...it is difficult enough for us to get economic development, let alone economic development that also contributes to the environment.”

(Regional Development Agency representative)

- “We’ve reached a stage now where companies have done all they can with their internal management, you know they’ve been ISO certified since 1996 they’ve reached all the targets and objectives that they possibly can...what else can they do... and I think those sorts of companies, obviously they’re the forward looking ones...the bigger ones...they’re looking to do something new and different and you know the concept of sustainable development is so ingrained now in policy that you know...they’re desperate almost to think well what can we do and when you present them with something like this that says, oh you’re going to get cost savings, resource efficiencies, new business opportunities, partnerships, they’d be mad not to lap it up.”
(Eco-Industrial Developer)

Integrating or balancing economy and environment?



- **EID as a tool for economic development:**
- “...we’re not selling it as an environmental programme...that’s not really of great interest to a business, so we’re selling it as in cost savings, new business opportunities that sort of language rather than tree-hugging green.”
(Developer)
- “...from a business point of view we’re looking for the option for companies to become more profitable, that’s the bottom line...”
(Local Authority Representative)
- **But increasing environmental consciousness...**
- “...turning it (an eco-site) into a positive business model, turning it into something that says actually there are lots of economic advantages that can be gained by going with the environment rather than against it”
(Regional Development Agency representative)

The role of partnership, collaboration and networking in eco-industrial development



- Developing eco-industrial sites: from one organisation's vision to wider stakeholder involvement

“...having a wide range of people is good, but getting them to put their hands in their pockets is a different matter.”

(Developer)

- Funding issues: the dependence upon public funds

“...the thing with this is it's a new development, it's a new concept, it's risky hence the EU/government funding because you wouldn't necessarily do it otherwise”

(Developer)

Encouraging collaboration and networking between firms

A good idea in theory but in practice many barriers to eco-industrial networking

1) Motivational Issues: building trust & commitment

“...there has to be a demand for this type of park, its all very well saying isn't it a wonderful concept...but you have to build up the interest within the industry to such a point that there's enough critical mass for it to be viable”
(Local Authority representative)

2) Regulatory and Technical Issues

“...you have to make sure that what is trying to be achieved is legal”
(Environmental Agency representative)

3) Overcoming conventional business norms

“...practicalities of getting different companies to work together, they've all got different cultures, issues of security and commercial confidentiality, so that could be a major stumbling block for getting different firms to talk to each other...”
(Participating firm representative)

Conclusions



- The transition from vision to reality: eco-industrial development as weak sustainability?
- Many barriers to creating more integrated and connected industrial systems
- Future business tool for encouraging the shift towards more sustainable forms of industrial development at a local and regional level?