

**CLEMANCE**

Clean  
Environment  
Management  
Centre

# Industrial Symbiosis

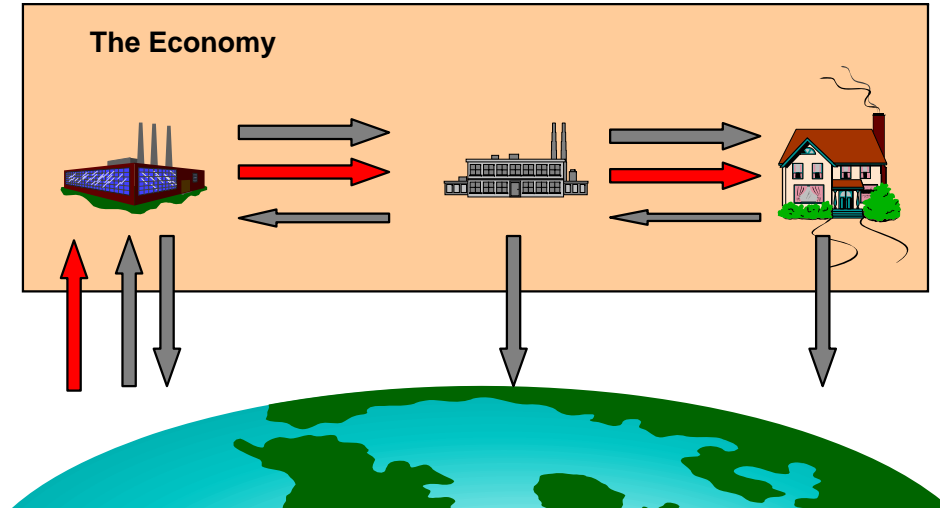
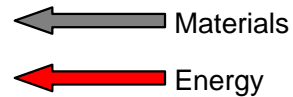
Gareth Kane, Centre Manager  
Christine Parry, IS Project Officer



UNIVERSITY OF  
**TEESSIDE**

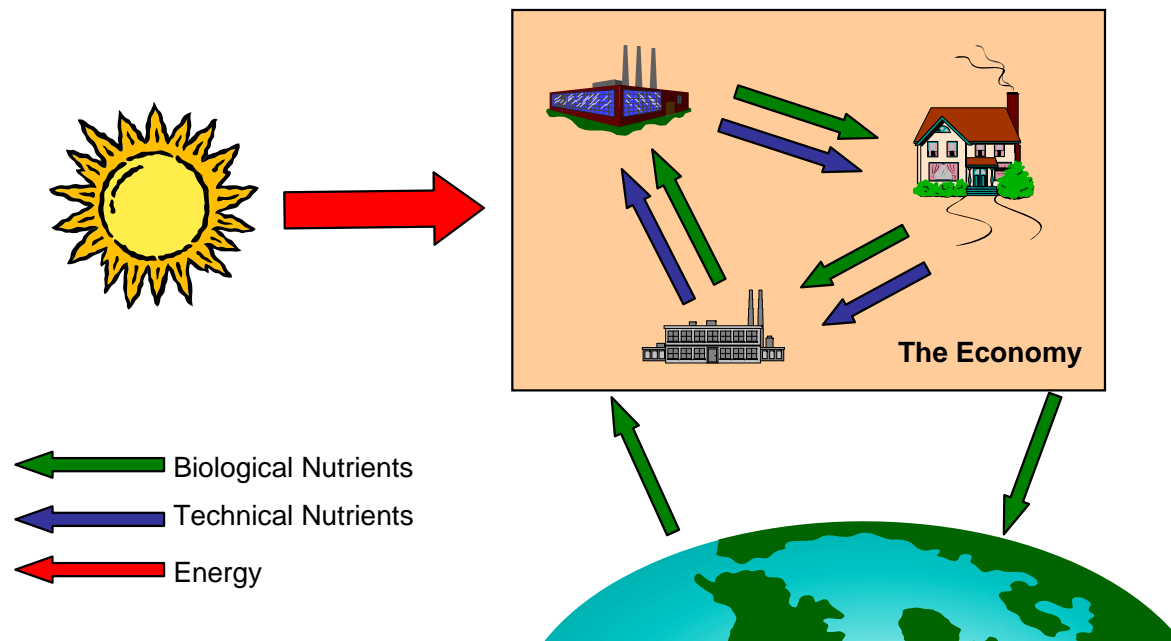
# Current Paradigm

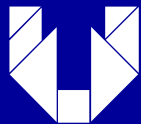
- ◆ Manufacturers, Processors and Consumers all produce significant volumes of waste
- ◆ Very little concern is given to sustainable use of resources



# Sustainable business

- ◆ In nature there is no waste
- ◆ Everything is considered as a feedstock for another process
- ◆ How can we achieve this in industry?





# Business Copying Nature

---

- ◆ Symbiosis is defined as "the coming together of dissimilar organisms in a mutually beneficial relationship".
- ◆ Industrial Symbiosis (IS) is about identifying and using synergies and linkages between cooperating industries to improve resource efficiency and minimise waste.
- ◆ This concept is not exclusive to any particular resource, as it can include
  - raw materials,
  - by-products,
  - human resources,
  - logistics,
  - services,
  - waste,
  - energy
  - Water



# The New Paradigm...

---



**Waste**



**Problem**



**Cost**



**Management**



**Treatment**



**Internal**



**Sectoral**



**Recycling**



**Resource**

**Opportunity**

**Source of Profit**

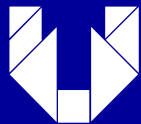
**Innovation**

**Adding Value**

**Collaboration**

**Cross-Sectoral**

**Cycling**



# What's in it for industry?

---

## ◆ Economics

- Turns a disposal cost into an income stream
- Can reduce the cost of raw materials
- Maximises use of under-utilised resources and facilities
- Spreads costs of new infrastructure

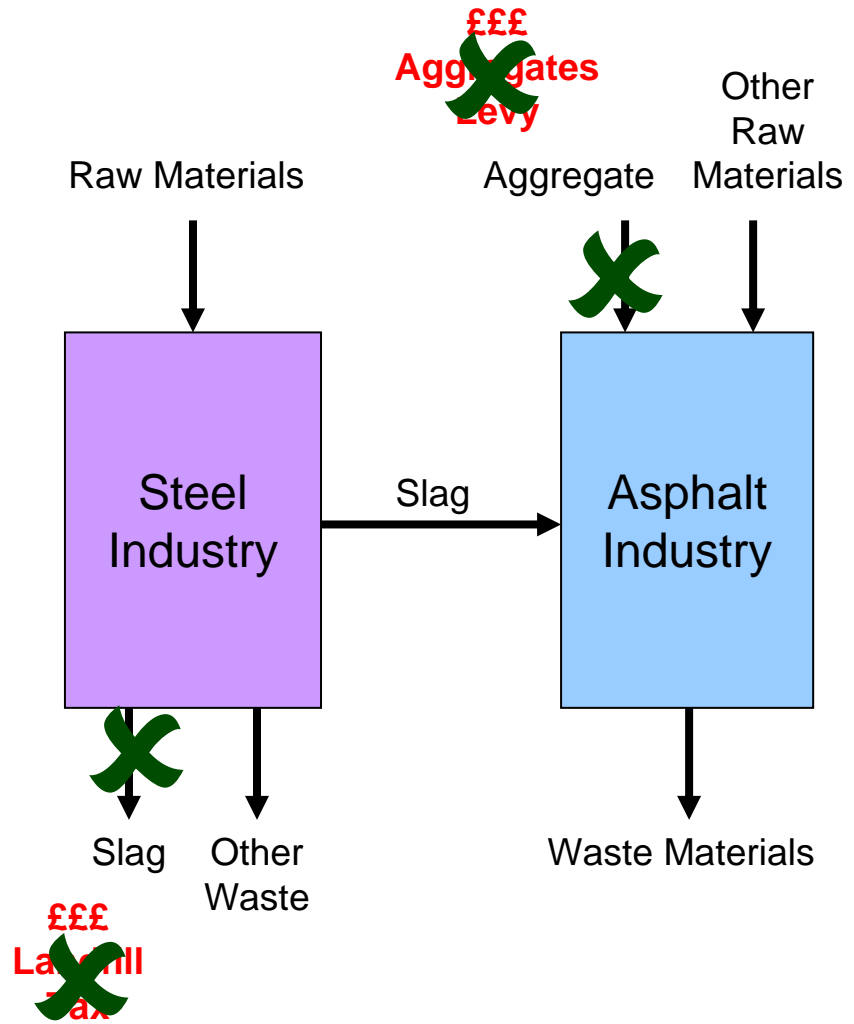
## ◆ Less tangible benefits

- Compliance with Regulations
- Public Relations
- Integration of business
- Adding economic robustness
- Safeguarding and creating employment

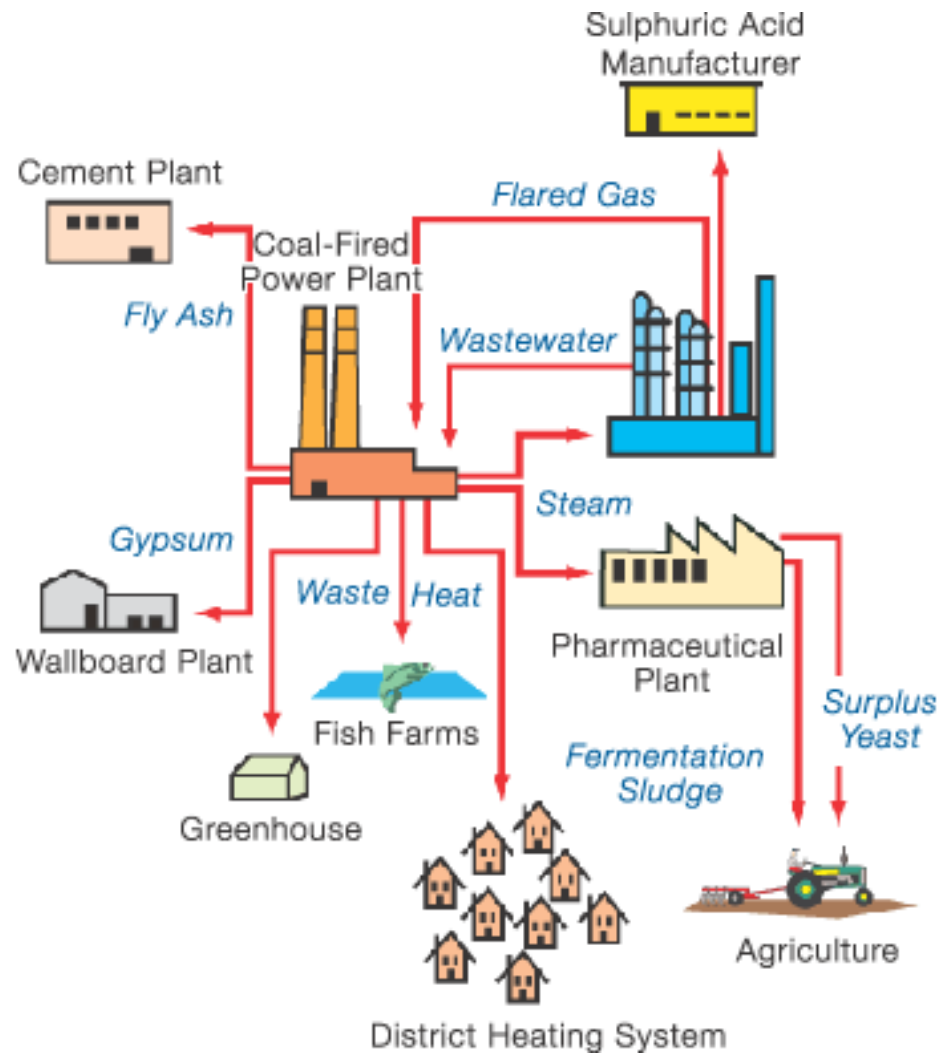
## ◆ Environment

- Reduces virgin resource use and net waste generation without compromising economic activity
- Major step towards a more sustainable society

# Example



# Kalundborg, Denmark



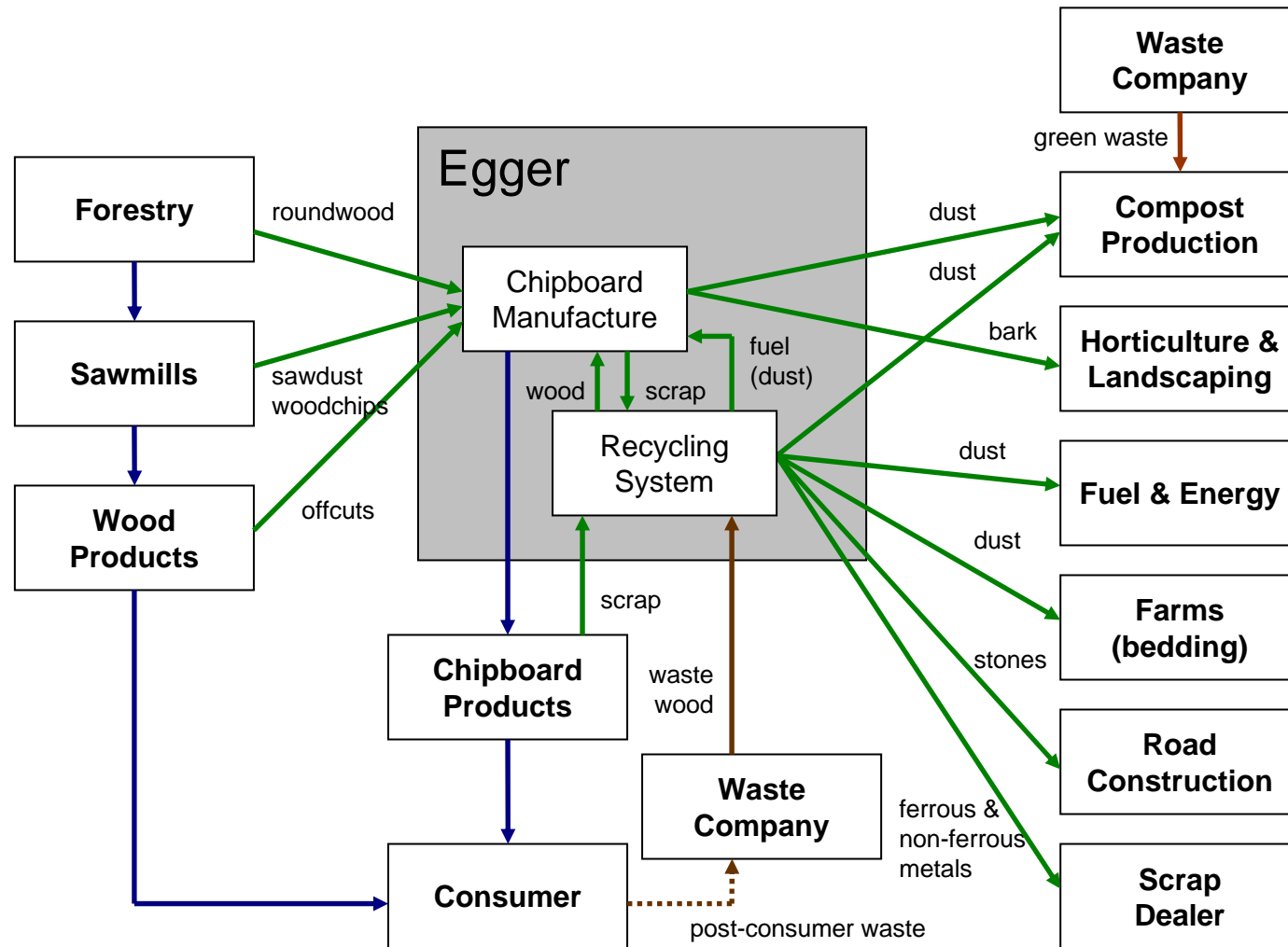
## Savings (pa):

- ◆ 19 000t Oil
- ◆ 30 000t Coal
- ◆ 60 000m<sup>3</sup> water
- ◆ 130 000t CO<sub>2</sub>
- ◆ 3 700t SO<sub>2</sub>

## 'Waste' materials (pa)

- ◆ 135t Fly Ash
- ◆ 2 800t Sulphur
- ◆ 80 000t Gypsum
- ◆ 800 000t Nitrogen

# Egger Ltd, Hexham



**CLEMANCE**

Clean  
Environment  
Management  
Centre

# Can It work in the North East?

North East Industrial Symbiosis Programme  
(NISP-NE)



UNIVERSITY OF  
**TEESSIDE**

# Past Experience

---

- ◆ CLEMANCE and CPI designed and delivered the Tees Valley Industrial Symbiosis Programme (TVISP)



- ◆ Outputs included
  - Creation of 20 jobs
  - 45404 Tonnes of material put to reuse
  - A further 100,000 T material contracted to supply a Biomass Power Plant
- ◆ With limited resource TVISP was hailed the single most successful environmental programme to date

# The Future

---

- ◆ CLEMANCE and CPI have been appointed regional coordinators for NISP North East (commencing 1<sup>st</sup> April 2005) for a three year duration
- ◆ With additional funding from Defra, ONE and RTV significant environmental benefit can be achieved
- ◆ Is your future IS?