



Sara Parkin

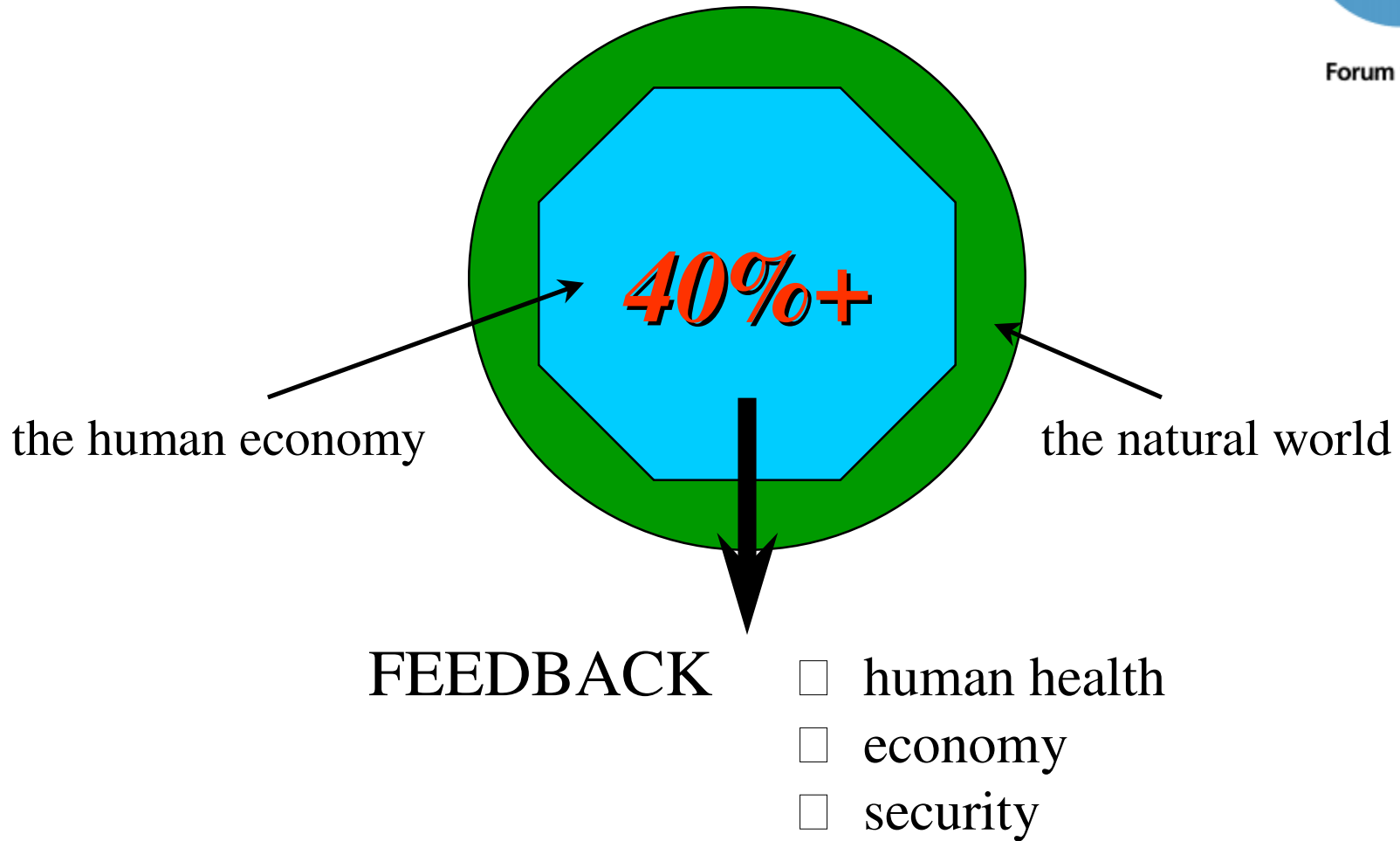
Programme Director

www.forumforthefuture.org.uk

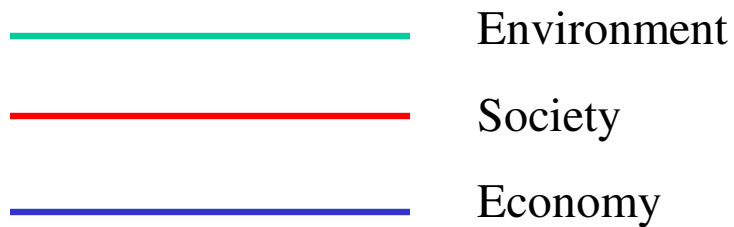
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Resource Productivity

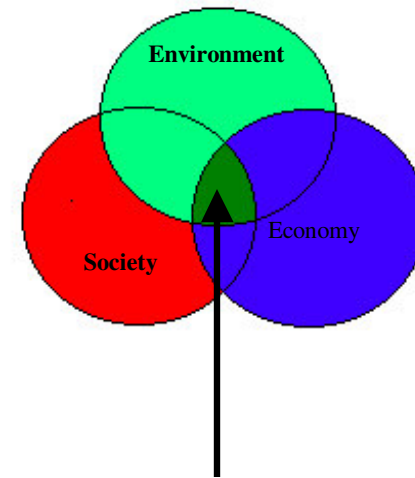
- Where am I coming from?
- Where are you in all this?
- What is Sustainable Development: how is it operationalised?
- Sustainable Development: the practical challenge
- The real new economy is a low-carbon one
- Sustainable Development: the spiritual challenge



Understanding Sustainability



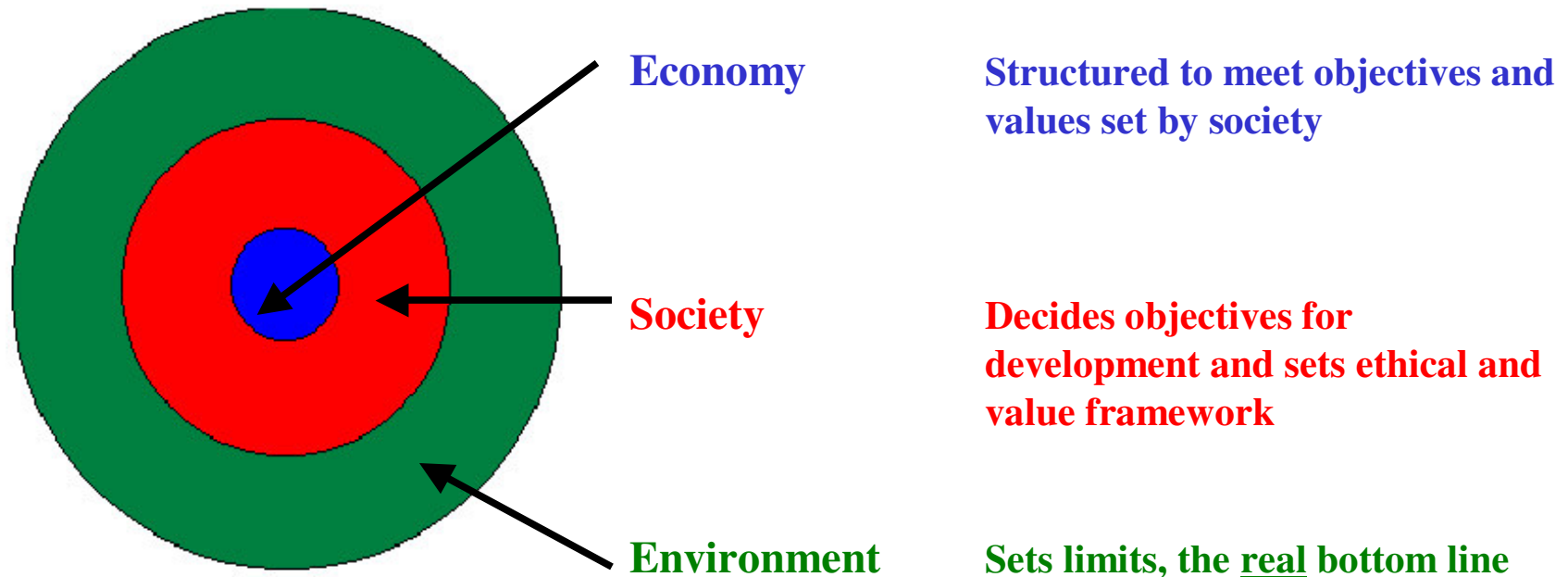
Triple bottom line



Sustainable Development

Sustainability Venn Diagram₄

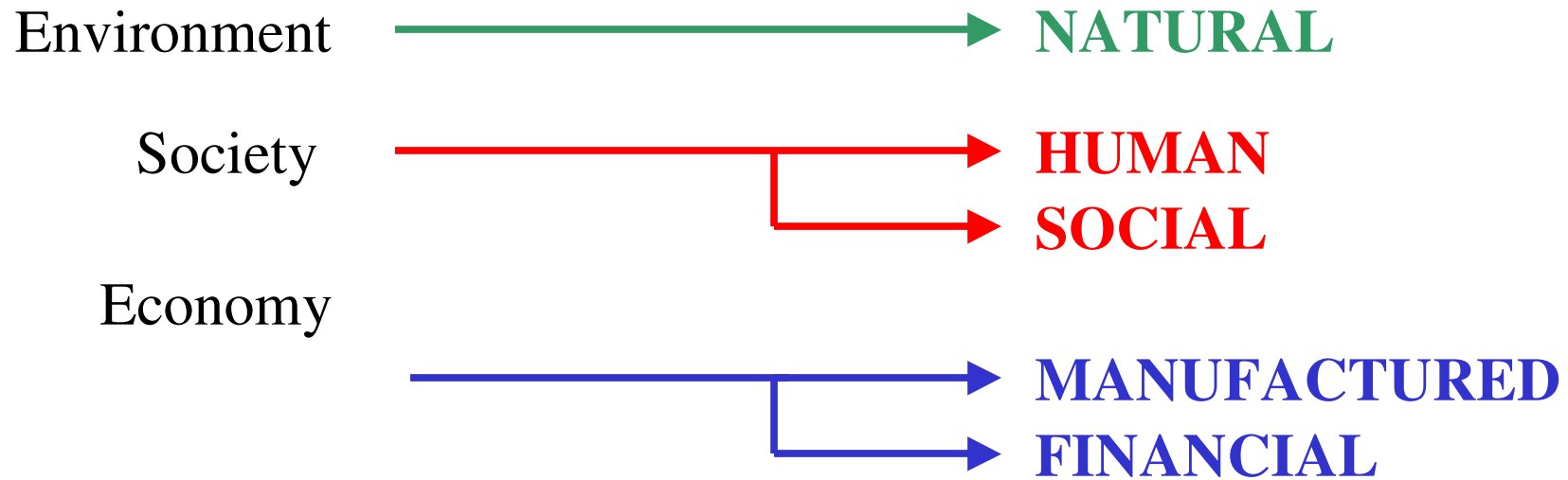
Understanding Sustainability: The real bottom line



Nature's bottom line

1. The essentials of life (air, water, nutrition) depend on the proper functioning of the planetary ecological systems
2. Only green cells produce energy and raw materials (matter) in a concentrated or structured form
3. Matter does not disappear
4. The overall tendency is for everything to return to its elemental state

Triple Bottom Line **→** **Five Capitals**



Capital STOCKS & flow of BENEFITS

NATURAL

STOCK: land, sea, air, rivers, ecological systems

FLOW: *energy, food, water, climate, waste disposal*

HUMAN

STOCK: health, knowledge, motivation, spiritual ease

FLOW: *energy, work, creativity, love, happiness*

SOCIAL

STOCK: governance systems, communities, families

FLOW: *security, justice, social inclusion*

MANUFACTURED

STOCK: tools, infrastructure, buildings,

FLOW: *places to live, work, play; access to them*

FINANCIAL

STOCK: money, stocks, bonds

FLOW: *means of valuing, owning, exchanging other
4 capitals*

Sustainable Development: Rocket Science

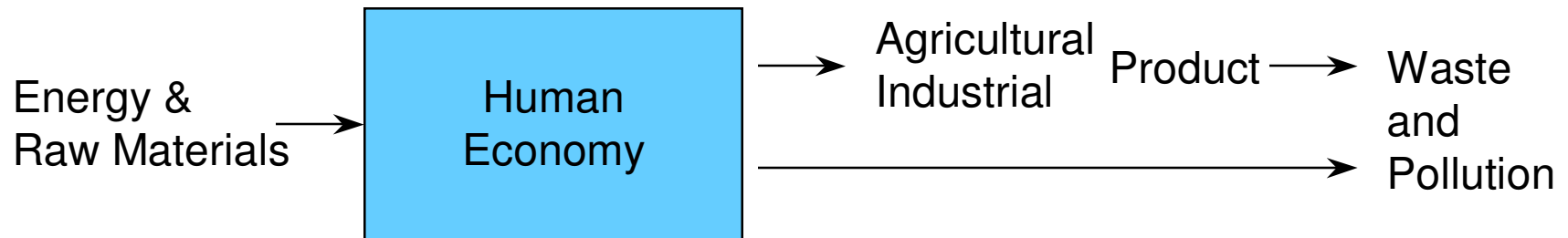


...the technology of man must be regarded as a heat engine and as such is subject to thermodynamic principles which govern energy transformations.

In this context, pollution in its myriad forms is seen as the agent by which the total energy is dissipated into the environment ... [pollution] is the inevitable consequence of the technological energy flux to which the organic world is not adapted.

Robert Muller, Goddard Space Flight Centre, 1971

Linear Economic Model



1. from Parkin, 1990

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Understanding Sustainability: The Practical Challenge



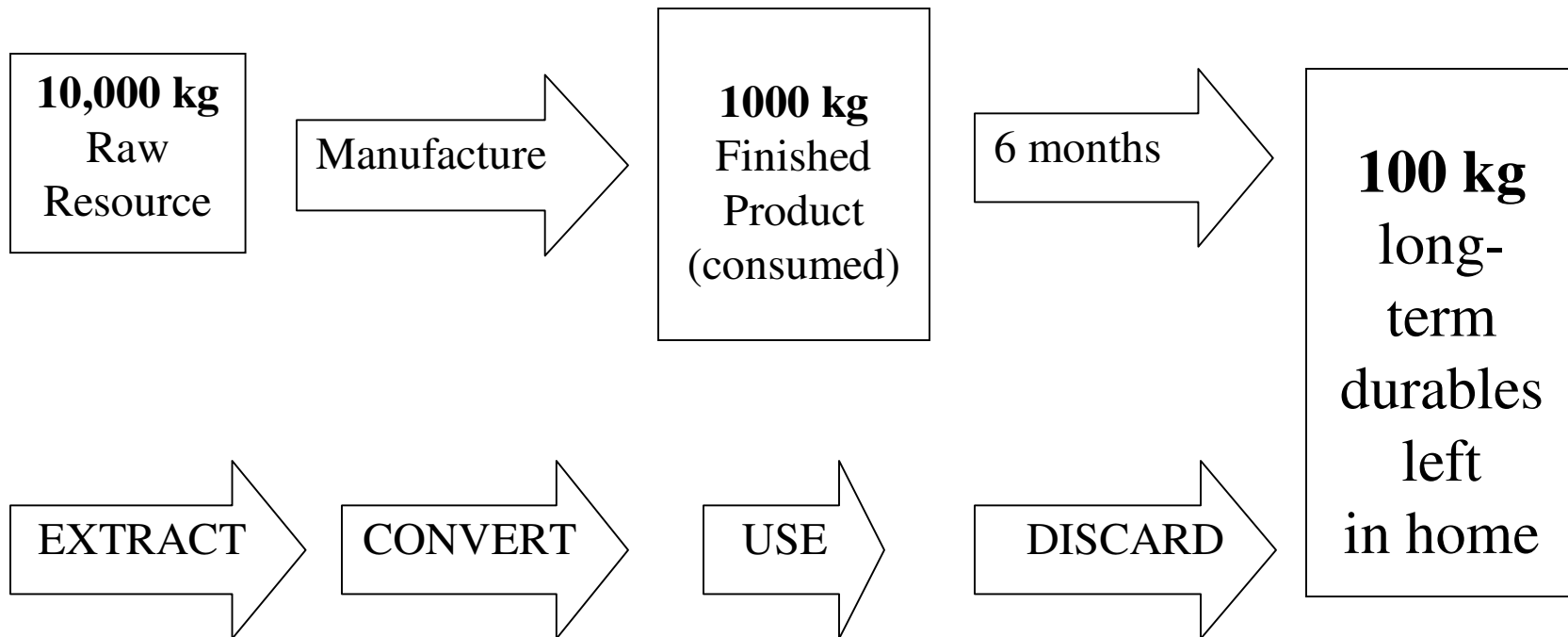
$$I = P \times C \times T$$

I Impact

P Number of People

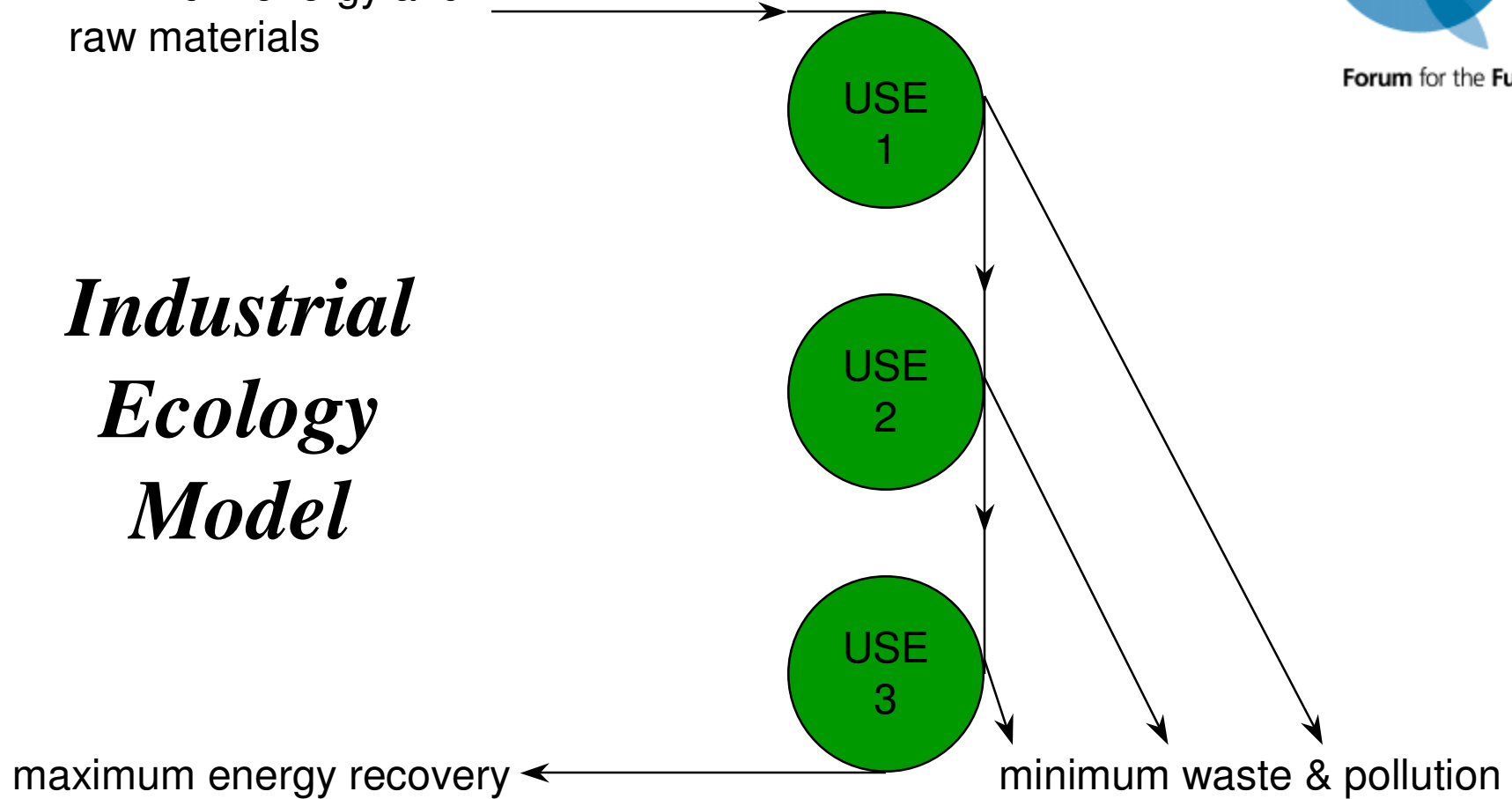
C Consumption per capita (GDP)

T Technology



minimum energy and raw materials

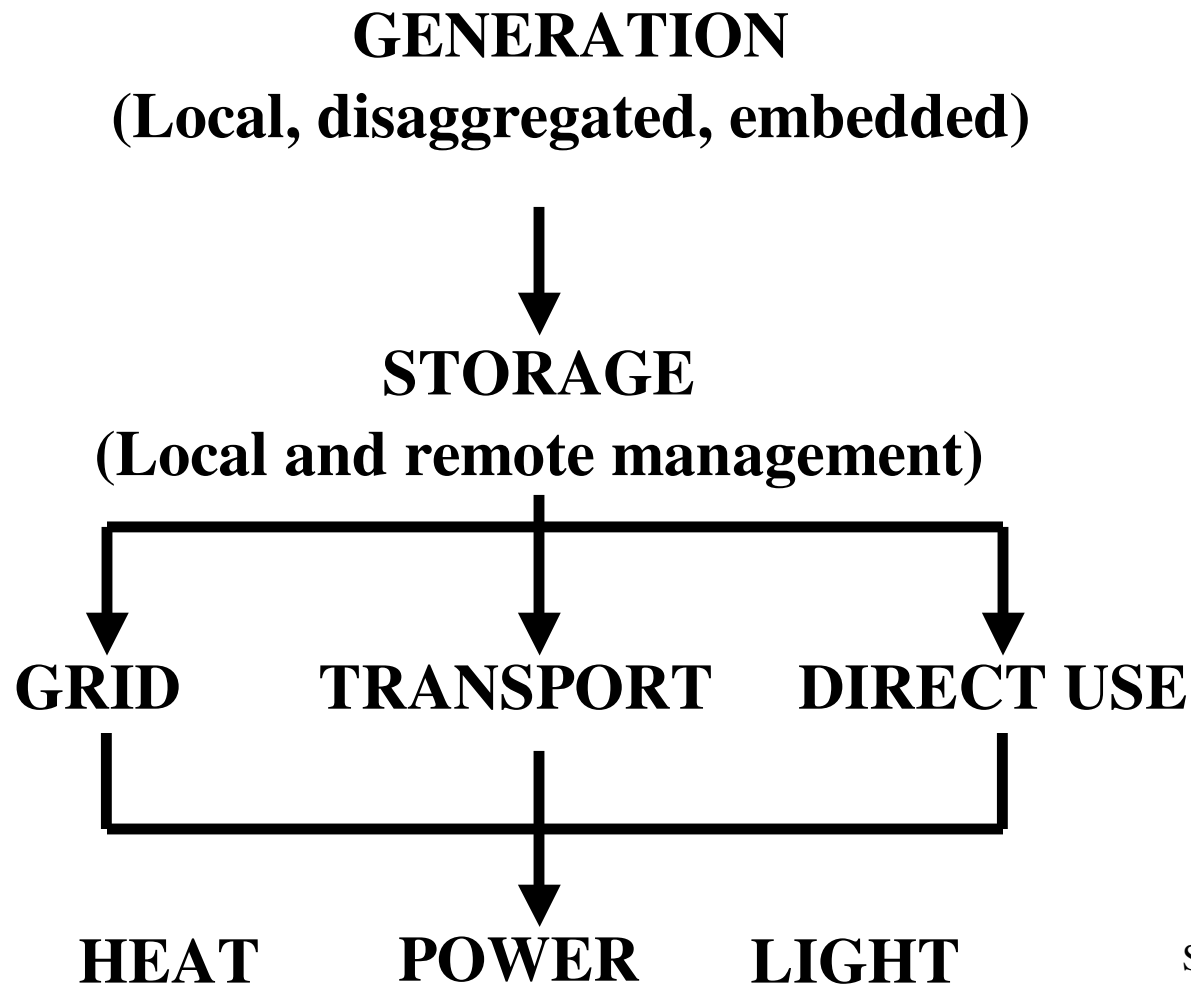
Industrial Ecology Model



The real new economy is a low-carbon one

- Energy efficiency and shift to renewables - including risk spreading strategies
- ‘Traditional’ environmental industries - end and mid-pipe technologies, monitoring, bioremediation etc.
- Products and services with 10 x less embodied energy

The new economy: secure energy futures



The new economy: ‘Factor 10’ products and services

1. Design = durability, remanufacturing, recycling, material and energy hyper efficiency
2. Extending liability = easy reuse, low pollution disposal
3. Leasing instead of selling = durability
4. Joint ownership = few products
5. Remanufacturing = repair, updating, refurbishment
6. Local services = delivery efficiency, economic regeneration

Toolkit for the new (low carbon) economy:

- Material Input Per Service Unit (MIPS)
lightening the 'ecological rucksack', shrinking the ecological footprint
- Life Cycle Analysis
cradle to grave (or cradle); real whole life costing
- Environmental (social, ethical) accounting
reckoning the true costs of goods and services
- Mass Balance Analysis
waste management becomes resource management
- Biological Engineering
permaculture, biomimicry, genetic manipulation
- Industrial Ecology
Cleaner production, clean technology
- Design for sustainability
Dematerialisation, rematerialisation, social benefits

Is that all there is to it?

The crux of the matter is not only whether the human species will survive, but even more whether it can survive without falling into a state of worthless existence.

Meadows et al, 1971

The new economy: human resources

Our vision is of an engineer who demonstrates through everyday practice:

- *an understanding of what sustainability means*
- *the skills to work towards this aim*
- *values that relate to their wider social, environmental and economic responsibilities*

and encourages and enables others to learn and participate.

The Engineer of the 21st Century Inquiry, June 2000

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*The new economy:
reconnecting people and planet*

A thing is right when it tends to preserve the integrity, stability and beauty of the biotic community. It is wrong when it tends otherwise.

Aldo Leopold, 1948



Thanks for listening

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