IF TODAY'S WASTE = TOMORROW'S RAW MATERIAL, WHAT INFRASTRUCTURE WILL WE NEED?

Made today, gone tomorrow?

Symposium series on future trends in resource use and management

Ian Williams

But first……

- The zero waste concept – that today's waste is tomorrow's raw material – is gaining support and momentum
  - New Zealand, Scotland and Wales
  - Not world leaders economically but first to move towards a 'closed-loop' circular system for resources

- Why is this important?

Zero WIN
Towards Zero Waste in Industrial Networks

40% of all waste sent to landfill in South East England is CD&E waste

£1m skip hire

£8.3m materials cost

£0.7m labour

FP7 ZeroWIN Project

Targets 4 sectors:

~3 million companies (of which 80% are SMEs):

- > €2,8 trillion turnover and value creation >€800 billion with >20 million employees
- Creating ~40% of all waste or >400 million tons of industrial waste
- Using ~50% of all materials extracted from Earth´s crust
- Generating ~40% of all energy use and ~35% of all greenhouse gas emissions
- See www.zerowin.eu for details

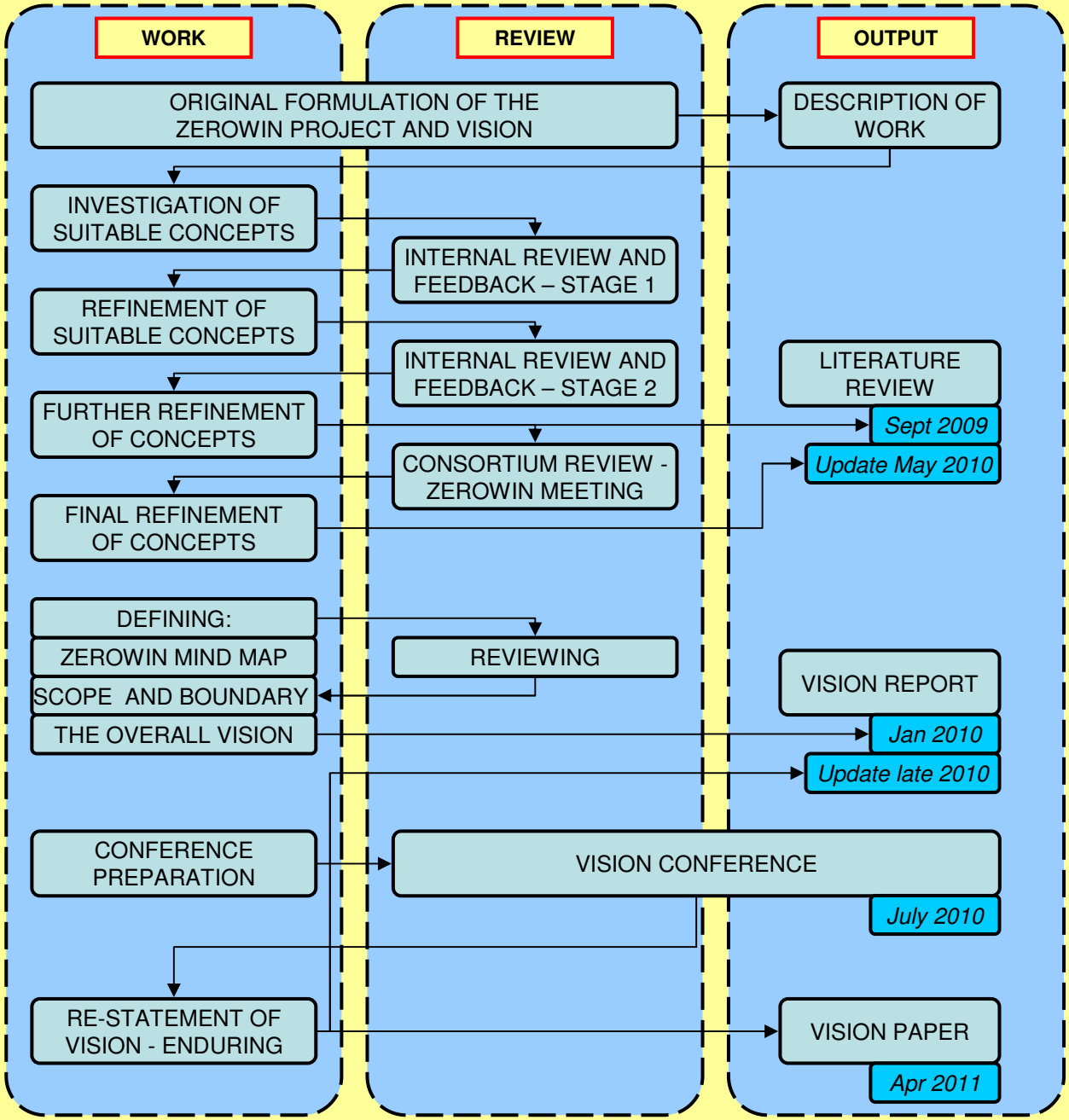
Zero waste is misleading……

- .. it does not mean that wastes will not arise in society

- A “second industrial revolution”
- Industries will be reorganized into clusters such that the integrated whole produces no waste
  - Environmental benefits
  - Shift towards renewable sources
  - Utilization of Earth's resources brought back to sustainable levels

- This is NOT a fantasy….

Creating the ZeroWIN Vision



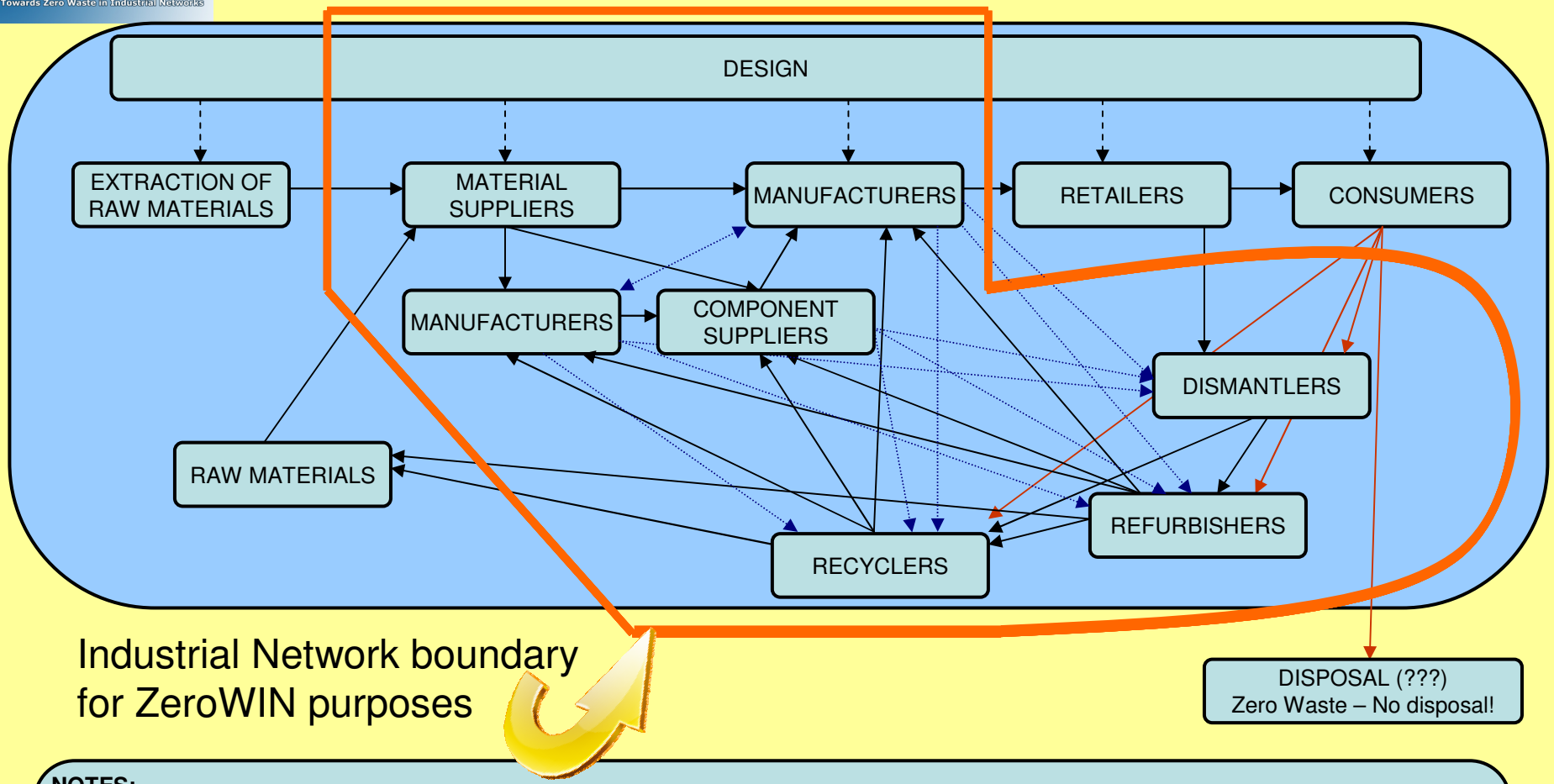
ZeroWIN Concepts Mind Map

Zero WIN
Towards Zero Waste in Industrial Networks

	KEY FOR ZEROWIN	CAN INFORM ZEROWIN	MINOR RELEVANCE
Broad approaches to sustainable industrial development	**ZERO WASTE** INDUSTRIAL ECOLOGY ECO-DESIGN[1]	CLEANER PRODUCTION POLLUTION PREVENTION	ZERO EMISSIONS NATURAL CAPITALISM
Methods underpinning the approaches	INDUSTRIAL SYMBIOSIS PRODUCT STEWARDSHIP (EPR/IPR) ECO-INDUSTRIAL PARKS SUPPLY CHAIN MANAGEMENT[2]	REVERSE LOGISTICS SELLING SERVICE RATHER THAN PRODUCT	ECO-LABELLING END OF LIFE MANAGEMENT[3]
Quantification/ assessment/ monitoring tools	LCA CARBON FOOTPRINTING	EMS EIA	INDUSTRIAL METABOLISM SOCIAL NETWORKS
General principles		SOCIAL ENTERPRISE PRECAUTIONARY PRINCIPLE	PROXIMITY PRINCIPLE

NOTES:
1 Includes relevant aspects of de-materialisation, prolongation of product use and green chemistry methodologies.
2 Includes relevant aspects of remanufacturing methodology; SCM herein has been adapted to meet the needs of ZeroWIN.
3 End of life management remains as an assessment tool, but is beyond the boundary of a ZeroWIN industrial network.

ZeroWIN Scope and Boundary



NOTES:

- The diagram represents a network of potentially diverse industries working together in symbiosis.
- The transport associated with material, product and waste flows are implied within the arrows.
- 'Manufacturers' is taken to include construction activities (something is produced).
- 'Dismantlers' is taken to include Materials Recycling Facilities, demolition activities and automotive dismantling activities.
- 'Refurbishers' is taken to include remanufacture, re-use and repair activities.
- 'Manufacturers' appears twice, to represent those that make individual/basic products and those that integrate materials, components and other products to create more complex products or services, for example construction sites and the automotive industry.
- Manufacturers produce final products but they also create waste materials/sub-products that shall be considered (blue dotted arrows).
- IPR/take-back scheme flows are not indicated to avoid confusion, but they are expected.
- Red arrows indicate downstream, post-consumer flows.

A Whole System Approach

- Means striving for:
  - Zero waste of resources: Energy, Materials, Human;
  - Zero emissions: Air, Soil, Water;
  - Zero waste in activities: Administration, Production;
  - Zero waste in product life: Transportation, Use, End of Life; and
  - Zero use of toxics: Processes and Products

- ZeroWIN's targets are:
  - 30% reduction of greenhouse gas emissions
  - 70% overall re-use and recycling of waste
  - 75% reduction of fresh water use

Key Definitions

Zero waste

"Zero waste is a goal that is both pragmatic and visionary, to guide people to emulate sustainable natural cycles, where all discarded materials are resources for others to use. Zero waste means designing and managing products and processes to reduce the volume and toxicity of waste and materials as close to zero as possible, conserve and recover all resources, and not burn or bury them. Successful Implementation of zero waste will eliminate all discharges to land, water or air that may be a threat to planetary, human, animal or plant health. In industry the goal of zero waste will be accomplished with the aid of industrial symbiosis and new technologies."

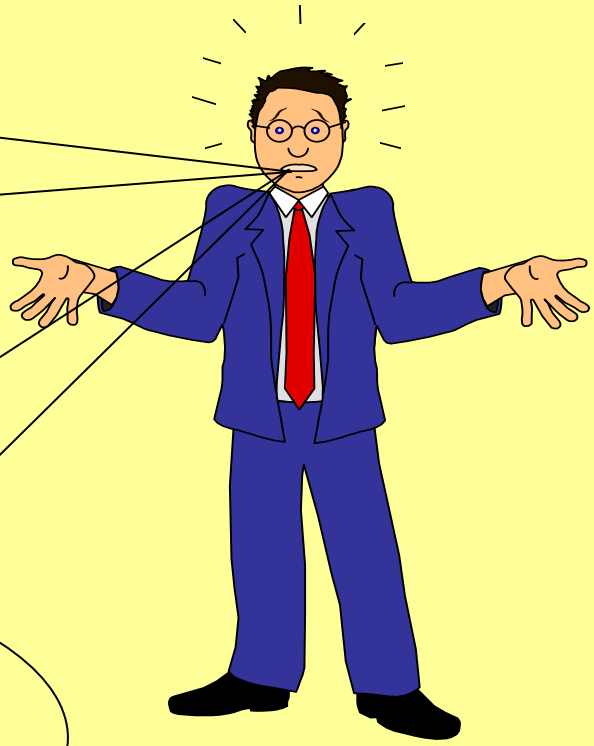
ZeroWIN Literature Review (Deliverable 1.1)

Reaching out

- The ZeroWIN Vision is currently an “Internal Vision”
  - “External vision” is simpler
- We need to speak more clearly to business and industry
- We need to appeal financially
- We need greater “visibility”
- We need to make a compelling case
- Our case studies need to be disseminated
- We need to be trusted and authoritative

To discuss……

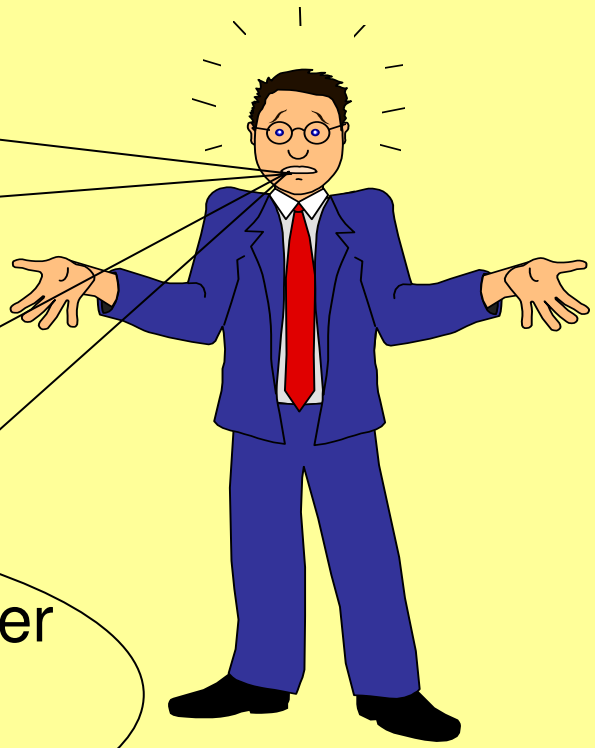
What will all this mean for future waste infrastructure decisions?



Are we capable of making the “right” decisions…..?

The ISB Model

It is not only
about infrastructure…



…we have to simultaneously consider
service provision and
behaviour change

Recycling

- Design out non-recyclables and hazardous materials
- Mass low-cost technology
  - One size will not fit all……..but mixed recyclables in single container makes sense; AWC ONLY
  - Combine municipal and commercial collections
  - “Recycling On The Go”
- Sensible siting of appropriate infrastructure
  - Greenstar (BIFFA) Atlas MRF
  - Logistical planning via modelling
  - Role of HWRCs and bring sites
- Different systems in different areas
  - Small smart multi-item bring sites for rural, high-density areas
  - Roll out for small and large WEEE, textiles, wood, ELV, batteries, furniture, toys, tools
- Market development; D4Rg, D4R; C&D wastes; plastics

Biowastes

- Home composting: only sensible option for garden waste
  - Little infrastructure needed; make space
  - Green waste collections:
    - During peak periods only?
    - MAKES TARGETS FARCICAL?
    - Aim to avoid visits to urban HWRCs
- AD for food waste
  - Will only work at app. scale for domestic food wastes
    - POTENTIAL CONFLICT WITH PREVENTION MESSAGE?
    - CONFLICT OF INTEREST FOR AD COMPANIES?
  - Established and practical technology; careful siting
  - Combine with agricultural/retail wastes to address scale/conflict issues?
- Education, education, education…

Reuse

- D4R is essential
  - Built-in obsolescence is a problem
  - Fast fashion/culture encourage crap rather than quality
  - CONFLICTING MESSAGES FROM GOVERNMENT
- Prolongation of life is important – domestic, private and public sectors
  - BUT IT ALL ENDS UP IN LANDFILL ANYWAY…..?
  - More complex for energy-using items
  - EEE, textiles, furniture, toys, tools, etc
  - Important role for Third Sector (e.g. Waste Watch, KBT, FRN)
  - Over-engineering? (Bazalgette and London Sewers…)
- Low C, logistically sensible collection systems need development e.g. mobile phones

Prevention

- Design out waste
  - It is nonsense to say we need packaging around bananas and turnips etc
  - Easter eggs……(I'm not a killjoy but……)
  - Develop ZeroWIN-style industrial clusters; target C&D wastes (resources); needs NISP-style organising
  - BUT WHAT ABOUT EEE? IT ALL COMES FROM ASIA…
- Target specific consumables e.g. food
  - NEED FOR SIMPLE, CONSISTENT MESSAGE
- Switch materials; lightweighting
- Education, education, education…

I'm ready for your excuses…

It won't work in rural/ urban/ INSERT OWN areas

Industry won't do it!

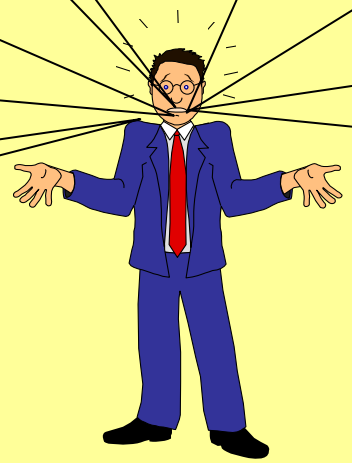
The logistics are too complicated

Who wants to live near to a resource management plant?

It will make the UK uncompetitive

It is too much effort

It is too expensive



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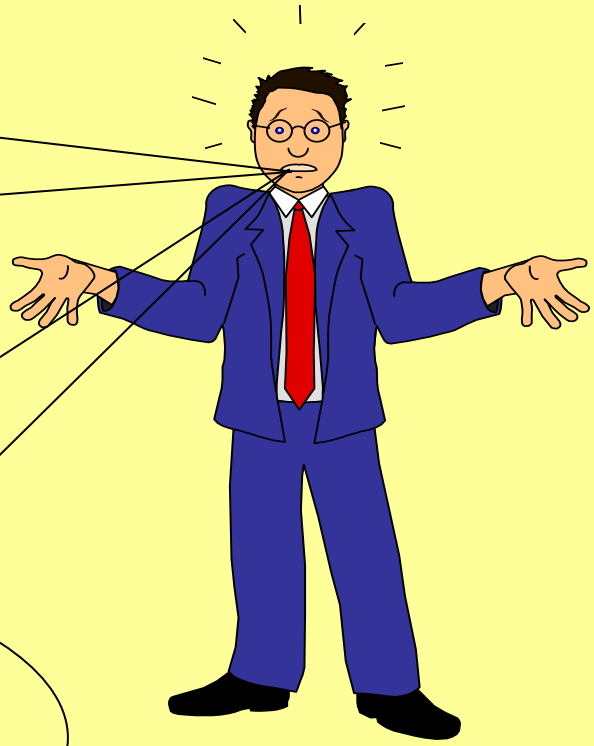

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