



NMP3 - CT - 2004 - 500311

Sustainpack

**Innovation and Sustainable Development in the Fibre Based
Packaging Value Chain**

Instrument: IP

**Deliverable 1.8
Technology Mapping Report
Appendix 2**

Due date of deliverable: 31/01/2006
Actual submission date: 28/02/2006

Start date of project: 2004-06-01

Duration: 4 years

Prepared by Pira International

Revision: [1]

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Appendix 2
Identified driver and features linkages
for each Sub-Project

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SP2 POTENTIAL PACKAGING FEATURES AND RELEVANT DRIVERS

Social:

Globalisation

Technological:

Materials science (Minimisation, renewable plastics, nanotechnology, functional foods)
 Processing technologies (Recycling technology & capacity, renewable energy, digital print, automation, flexible manufacture, hygiene)
 Distribution (Efficiency - fuel and trips)

Environmental:

Pack manufacture (Pollution control, climate change (kyoto), raw material availability, fuel availability)
 General (Consumer awareness and demands, sustainability, retailer energy issues, space for keeping packaging in the home prior disposal/ recovery)

Economical:

Raw materials (Oil price rises, steel availability, pack optimisation)
 Globalisation (Brands and information)

Political:

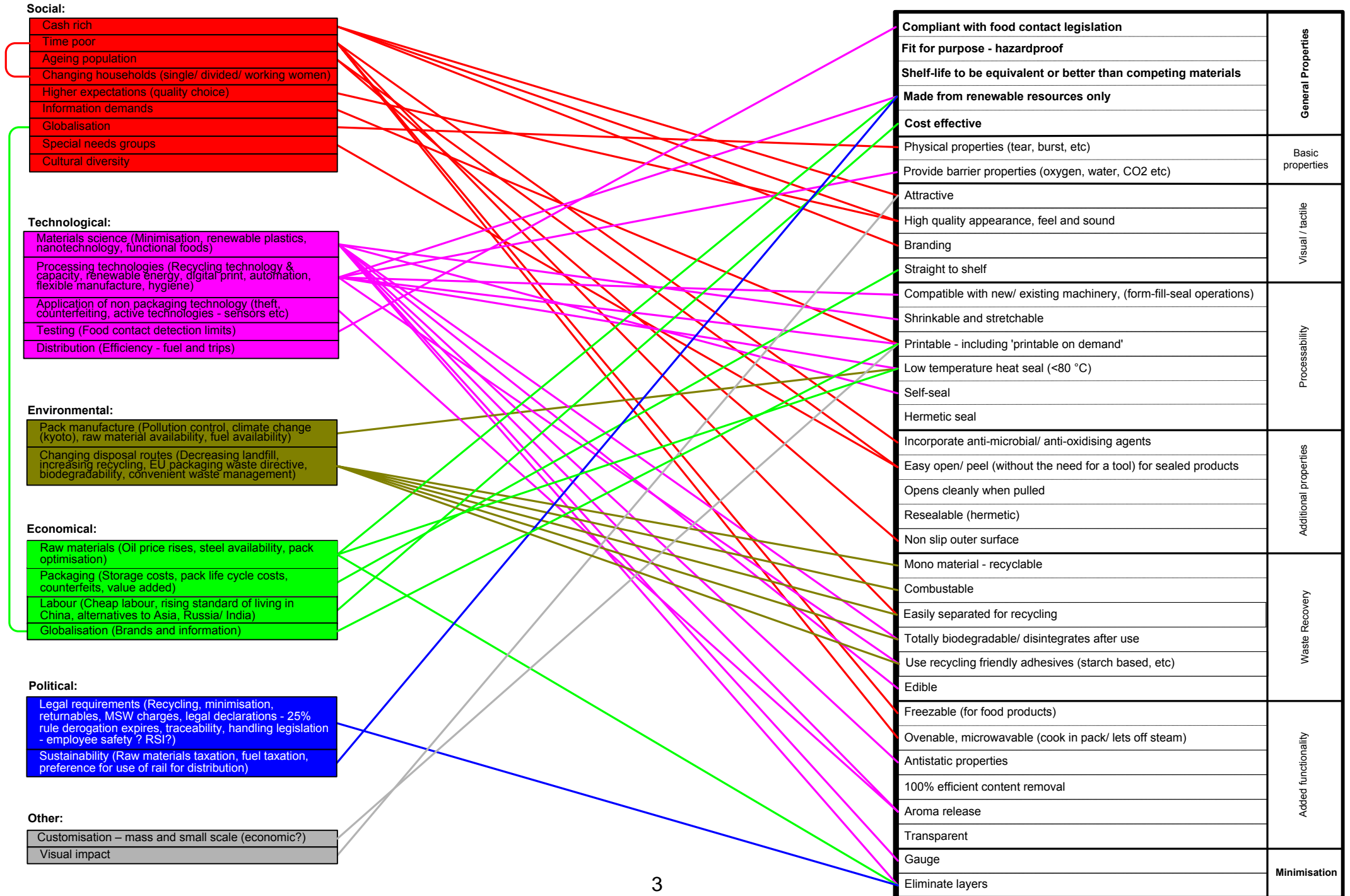
Legal requirements (Recycling, minimisation, returnables, MSW charges, legal declarations - 25% rule derogation expires, traceability, handling legislation - employee safety ? RSI?)
 Sustainability (Raw materials taxation, fuel taxation, preference for use of rail for distribution)

Other:

Increase in supply chain complexity

Increase rigidity, structural integrity	Basic properties
Barrier properties (moisture/wet strength/gas)	
Physical and strength properties to be defined for each demonstrator	
Lightweight yet strong / inconspicuous (thinner recycled board)	Minimisation
Minimised	
Optimise pack size to product size	
Minimisation of 3D pack components + space required by them	

SP3 POTENTIAL PACKAGING FEATURES AND RELEVANT DRIVERS



SP4 POTENTIAL PACKAGING FEATURES AND RELEVANT DRIVERS

Social:

Cash rich
Time poor
Ageing population
Changing households (single/ divided/ working women)
Higher expectations (quality choice)
Safety assurance
Information demands
Globalisation
Theft
Special needs groups

Technological:

Materials science (Minimisation, renewable plastics, nanotechnology, functional foods)
Processing technologies (Recycling technology & capacity, renewable energy, digital print, automation, flexible manufacture, hygiene)
Application of non packaging technology (theft, counterfeiting, active technologies - sensors etc)
Testing (Food contact detection limits)
Distribution (Efficiency - fuel and trips)

Environmental:

Pack manufacture (Pollution control, climate change (kyoto), raw material availability, fuel availability)
Changing disposal routes (Decreasing landfill, increasing recycling, EU packaging waste directive, biodegradability, convenient waste management)
General (Consumer awareness and demands, sustainability, retailer energy issues, space for keeping packaging in the home prior disposal/ recovery)
Environmental politics

Economical:

Raw materials (Oil price rises, steel availability, pack optimisation)
Packaging (Storage costs, pack life cycle costs, counterfeits, value added)
Labour (Cheap labour, rising standard of living in China, alternatives to Asia, Russia/ India)
Globalisation (Brands and information)

Political:

EU accession (Hygiene, food contact)
Legal requirements (Recycling, minimisation, returnables, MSW charges, legal declarations - 25% rule derogation expires, traceability, handling legislation - employee safety ? RSI?)
Sustainability (Raw materials taxation, fuel taxation, preference for use of rail for distribution)

Other:

Unemployment
Customisation – mass and small scale (economic?)

Inert - environment proof i.e. wet/dry/hot/cold	General Properties
Attractive design/look, good shelf impact	
Enables a shelf-life equivalent or better than competing materials	
Improved branding and image for low value goods & prestige	
Renewable resource - based coatings (i.e. starch)	Surface Properties
Compliant with food contact legislation where applicable	
Improve sensory appeal (i.e. soft to touch)	
Non slip outer surface	Processability
Printable (offering high quality decoration potential)	
Printable on demand (in house - customisable)	
Straight to shelf (improved quality, appearance)	
Compatible with form-fill-seal filling operations	Waste Recovery
Allow pack to be collapsed with ease	
Printable - including 'printable on demand'	
Low temperature heat seal	Opening Closing
Self-sealing (during filling - reseal at home)	
Disintegrates after use - with water or when eaten by humans or animals	Additives
Easily recoverable after use (Recyclability and combustability, 100% biodegradable - not mixed with non-biodegradable)	
Use recycling friendly adhesives (starch based, etc)	
Easy open (without the need for a tool) for sealed products, and opens cleanly	Minimisation
Effective/ easy reclose method for life of product, with possible hermetic reclose	
Incorporate anti-microbial, anti-oxidants agents	
Incorporation of insecticides for import/export of perishable goods	
Sensory addition to pack for instant impact (i.e. scent patch or inks that smell like the product to portray contents)	Added Value
No outer sleeve for multipacks, individual packs held in place by perforations	
Contain product without the need for PE wrap	
Remove inner bags/bottles and keep outer pack to provide UV and other barrier	
Eliminate the barrier layers in (PE and Al) in liquid beverage cartons	
Antistatic properties to prevent the need for anti-static bags.	
Allows labelling to be removed without damaging the pack	
Incorporate anti-counterfeit methods using hologram/ invisible ink/ stripes visible in black light and embossing technologies	
Microwavable and/or ovenable	
Freezable (for food products)	
Pack changes colour when cooked	
Enables complete removal of contents from inside pack and around closure	
Precut handles (Makes precut handles invisible when not used)	

SP5 POTENTIAL PACKAGING FEATURES AND RELEVANT DRIVERS

Social:

Time poor
Ageing population
Changing households (single/ divided/ working women)
Higher expectations (quality choice)
Special needs groups

Technological:

Materials science (Minimisation, renewable plastics, nanotechnology, functional foods)
Processing technologies (Recycling technology & capacity, renewable energy, digital print, automation, flexible manufacture, hygiene)
Application of non packaging technology (theft, counterfeiting, active technologies - sensors etc)
Distribution (Efficiency - fuel and trips)

Environmental:

Pack manufacture (Pollution control, climate change (kyoto), raw material availability, fuel availability)
Changing disposal routes (Decreasing landfill, increasing recycling, EU packaging waste directive, biodegradability, convenient waste management)

Economical:

Raw materials (Oil price rises, steel availability, pack optimisation)
Packaging (Storage costs, pack life cycle costs, counterfeits, value added)

Political:

Legal requirements (Recycling, minimisation, returnables, MSW charges, legal declarations - 25% rule derogation expires, traceability, handling legislation - employee safety ? RSI?)
Sustainability (Raw materials taxation, fuel taxation, preference for use of rail for distribution)

Other:

Increase in supply chain complexity
Visual impact

Compliant with food contact legislation	General Properties
Optimise pack size to product size	
Use of renewable fillers	Basic properties
Barriers integrated into the board	
Reinforced carton to prevent spillage (rigidity, structural integrity)	
Simpler internal/ cushioning packaging	Visual / tactile
Straight to shelf (improved quality, appearance)	
Ergonomic	
3D pictures/ designs	Processability
Radiation sensitive fibres – energy from radiation to produce folds instead of a creasing rule	
Low temperature heat seal	
Printable – (i.e. distortion printing before forming)	
Self-sealing	Additives
Incorporate anti-microbial agents/ anti oxidants	
Collapsible/ deflatable on disposal	Waste Recovery
Mono-material	
Recyclable / combustible	
Recycling friendly adhesives (starch based, etc)	Added functionality
Compartmentalised, with barriers to control cooking speeds for individual compartments	
Freezable (for food product demonstrators)	
Dual purpose (food/non-food)	
Microwaveable and/or ovenable (for food product demonstrators)	
Dynamic (shrinkable/ stretchable/formable/sprayable)	
Shaped for convenience (i.e. stackable 'geometric,' stands up even though flexible)	Added Value
Self cooking/ heating/cooling packs	
Dosing (automatic)	
Single portions	
Insulated (i.e. no cold chain required for food products)	Minimisation
Remove inner bags/bottles and keep outer carton/ pack (with UV and humidity barrier)	
Foam packaging, to allow removal of outer carton	
Contain product without the need for PE wrap	
Remove outer packaging just use inner pack with print on	

SP6 POTENTIAL PACKAGING FEATURES AND RELEVANT DRIVERS

Social:

- Cash rich
- Time poor
- Ageing population
- Changing households (single/ divided/ working women)
- Higher expectations (quality choice)
- Safety assurance
- Information demands
- Globalisation
- Theft
- Changing shopping habits (local produce, delayed decisions, polarised retail goods)
- Special needs groups
- Cultural diversity

Technological:

- Communication technology (Internet procurement/ consumer purchasing, checkoutless shops, mobile computing)
- Application of non packaging technology (theft, counterfeiting, active technologies - sensors etc)
- Distribution (Efficiency - fuel and trips)

Environmental:

- General (Consumer awareness and demands, sustainability, retailer energy issues, space for keeping packaging in the home prior disposal/ recovery)

Economical:

- Packaging (Storage costs, pack life cycle costs, counterfeits, value added)
- Globalisation (Brands and information)
- General (Retailer power, competition, own label, more brands, new niches, more service based, change in social classes, longer distribution distances)

Political:

- Legal requirements (Recycling, minimisation, returnables, MSW charges, legal declarations - 25% rule derogation expires, traceability, handling legislation - employee safety ? RSI?)

Other:

- Increase in supply chain complexity
- Press/media power (scares etc)
- More marketing routes
- Terrorism
- Customisation – mass and small scale (economic?)
- Visual impact

Moving brand logo	Moving graphics/ visual interaction:
Image of product	
Interactive entertainment	
Product information	
Instore sales promotion	Talking pack/aural interaction
Provision of information instore/ at home	
Audible alert	
Linked to consumer loyalty card	
Content level indicator or self ordering	Quality/consumer assurance
Plays jingle	
Aroma release	
Changing use by date	
Shelf life indicator	
Light exposure	
Bacterial growth	
Distribution data	
Physical damage alert	
Gas composition – indication/ adjustment	
Preparation/ defrosted indicator	Changeable information
Historical vs Real time	
Multi-language/multi information (press flag)	
Stored/ remote information	Artificial intelligence
Shelf life data (sell by date, price, promotions)	
Store/ shelf interaction	
Safety mechanisms	
Self heating and cooling	Tags
Controlled dispensing/ opening	
Provides a medical diary	
Programmes appliances	
Checkoutless retail	Anti counterfeit
Inventory management	
Supply chain tracking (track and trace)	Security
Traceability	
Coded pack (link to mobile phone for opening)	
Activated/opened by biometric information	
Anti-theft (from warehouse/ retail situation)	
Tamper evidence alert/ alarm	